VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELAGAVI – 590 018

An Internship Project Report
on

Library Management System

Submitted in partial fulfillment of the requirements for the VIII Semester of degree of **Bachelor of Engineering in Information Science and Engineering** of Visvesvaraya Technological University, Belagavi

by

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RNS INSTITUTE OF TECHNOLOGY

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

CERTIFICATE

Certified that the Internship work entitled ***Library Management System*** has been successfully completed by **Preethan Anup Jain (1RN18IS079)** a bonafide student of **RNS Institute of Technology, Bengaluru** in partial fulfillment of the requirements of 8th semester for the award of degree in **Bachelor of Engineering in Information Science and Engineering** of **Visvesvaraya Technological University, Belagavi** during academic year **2021-2022**. The internship report has been approved as it satisfies the academic requirements in respect of internship work for the said degree.

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DECLARATION

I, **PREETHAN ANUP JAIN [USN: 1RN18IS079]** student of VII Semester BE, in Information Science and Engineering, RNS Institute of Technology hereby declare that the Internship work entitled ***Library Management System*** has been carried out by us and submitted in partial fulfillment of the requirements for the *VIII Semester degree of* ***Bachelor of Engineering in Information Science and Engineering*** *of Visvesvaraya Technological University, Belagavi* during academic year 2021-2022.

Place: Bengaluru

Date:

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(1RN18IS079)

ABSTRACT

Library is place where all kind of books are available. Intranet Library Management system is a web-based application. This system contains list of all the books and can be accessed by remote users concurrently from anywhere in the campus. But for that user must be registered user. This system is three tier architecture.

Client sends requests, on receiving the request the server processes it and extracts the data from database and sends the result back to the client. This system provides separate interface and login for librarian, students and faculties. Librarian can modify database.

Users can search for books and renewal books online. They can recommend for new books by just sending messages to the librarian from any where in the college. They can view the issue and return dates of any book and due they have to pay. This system generates reports that can be used in analyzing the library performance. Thus, the management can take appropriate steps to improve the facilities.

ACKNOWLEDGMENT

At the very onset I would like to place our gratefulness to all those people who helped me in making the Internship a successful one.

Coming up, this internship to be a success was not easy. Apart from the sheer effort, the enlightenment of the very experienced teachers also plays a paramount role because it is they who guided me in the right direction.

First of all, I would like to thank the **Management of RNS Institute of Technology** for providing such a healthy environment for the successful completion of internship work.

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PREETHAN ANUP JAIN

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List of Abbreviations

DSDEPHR	Distributed Storage design for Encrypted Personal Health Record
HD	Hadoop Database
SRS	Software Requirement Specification

Chapter 1. INTRODUCTION:

Library Management System consists of list of records about the management of the details of the students and the issues going on and also about some books and all. This is a web-based application. The project has three modules namely- User, Registration, Librarian. According to the Modules the Distributor and Sub Distributors can manage and do their activities in easy manner.

As the modern organizations are automated and computers are working as per the instructions, it becomes essential for the coordination of human beings, commodity and computers in a modern organization. This information helps the distributors to purchase or sale the products very efficiently.

The administrators and all the others can communicate with the system through this project, thus facilitating effective implementation and monitoring of various activities of the distributor of a supermarket.

1.1 EXISTING SYSTEM

Various problems of physical system are described below: -

- If one is not very careful then there is a possibility of issuing more than one book to a user.
- There is a possibility of issuing a book to a user, whose membership is not there.
- When a user requests for a book, one has to physically check for the presence of a book in the library
- Answering management query is a time-consuming process.
- Daily keeping a manual record of changes taking place in the library such as book being issued, book being returned etc. can become cumbersome if the library size is bigger.

DISADVANTAGES

- Fast report generation is not possible.
- Tracing a book is difficult.
- Information about issue/return of the books are not properly maintained.
- No central database can be created as information is not available in database.

1.2 PROPOSED SYSTEM

The LIBRARY MANAGEMENT SYSTEM is a software application which avoids more manual hours in taking the book, that need to spend in record keeping and generating reports. Maintaining of user details is complex in manual system in terms of agreements, royalty and activities. This all have to be maintained in ledgers or books. Co-coordinators needs to verify each record for small information also.

- Easy search of book in the online library.
- Avoid the manual work.
- User need not go to the library for Issue any kind of book, he can renewal the book online.

ADVANTAGES:

- It provides "better and efficient" service to members
- Reduce the workload of employee
- Faster retrieval of information about the desired book
- Provide facility for proper monitoring reduces paper work and provide data security. All details will be available on a click

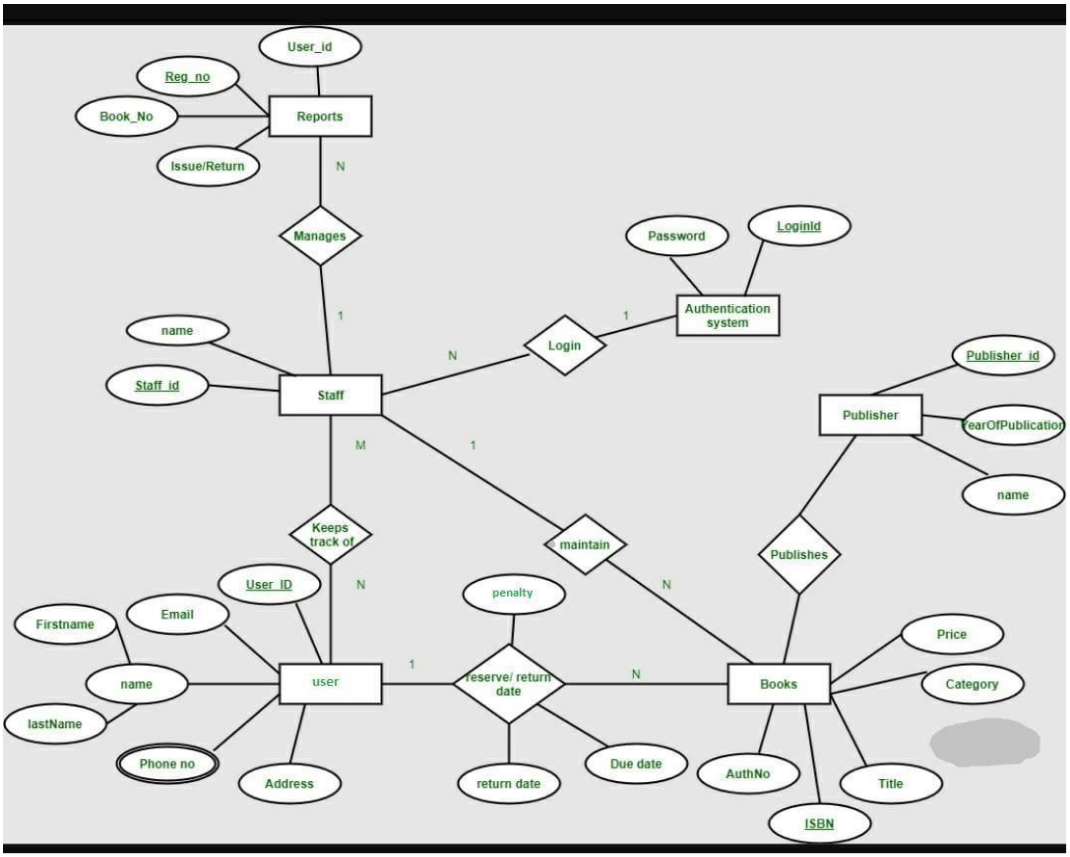

Fig 1.1 E-R diagram

Chapter 2. Literature review

2.1Acquisition module

Every library in the world has its own parchasing transaction for collection development purposes. Figure shows some opticas available via Acquisition module such as orders, receipts, invoices, and vouchers. For order option, librarians can add new orifer, view the order as well at update their orders

This module provides assistant to the librarians in the Acquisition department in terms of purchasing material and dealing with vendor. All transaction can be viewed within this module and decision can be made regarding purchasing process. Yang (2013) stated that new system (Acquialtion Module) facilitates the purchasing and the adding of electronic journal to the library holdings.

2.2 Circulation module

Circulation Module is one of the most important modules in Library Management System (LMS) because this area drahs directly with ser or library (Khan, 2016) (Quawardena, 2016). In the bnry, there is one system known as Koba Integrated Library Management System (LMS) This vysum fas soms options for material check out, patron details, overdes fines and other options that were needed for cinulation modules

Adding new patron cond, allow circulation for user, patron cond checking are also available within this modale le patron epilon, Sihtarian can create new record for patron and also check patron record which includes patron transaction as well an patron account. Another aption is Circulation desk which alles hooks to be alreutated.

2.3 Cataloguing module

Every material that library has purchased needs to be catalogued to make it accessible by aser Basically, Kaba Library Management System has data entry for new materials such as Tag 245 (Tides was classified by several sub-areas and can be inserted by librarian based on record compatibility Librarian can perform copy cataloguing by saving the MARC record from other instination before

all details will be migrated together with our new local record. Another advantage of using cataloguing module is that librarian can upload meny MARC recands at one time. This will facilitate alguer performing the task.

2.4 Increase speed in variety of task

One of the major improvements that can be seen when library started using LMS is the ability to speed up the library's overall performance especially the library's task Comparing when there is no integrated system, all data need to be process of manually by librarian and this will give a hard time in managing the valuable record within the library. Library holdings are increasing from time to time especially for big institution such as university and with the rapid growth of library sends one system that analyst them in managing all items in the libraries According to Archana, Padmakumar and Bea (2014), library can sure a lot of efforts in doing their work because LMS has the ability to download the MARC moud Bun other institution and upload it to the library's datahase. This statement refer to reduction of effort by Cataloguing department where with the availability af 239.50, hraries can share their catalogue record and allow copy cataloguing to be done.

Background Screen Grab Search Higher.

2.5 Higher Job satisfaction

Library Management System (LMS) facilitates librarian works, this effort will increase the motivation and satisfaction of librarian in doing their task effectively. Yongming and Dawes (2012) stated that the development of new system will provide more flexibility and enable librarian to work efficiently. As mentioned before, new LMS provides the means of access not only for printed materials within the holdings, but they have also improved the system to match electronic resources in the library, Creator of LMS needs to think about the needs of Gen Y where they need all the information within one click. Thus, for end user interface, Chamo Web OPAC for example allows the classification of materials based on its type and allows direct access for electronic material based on the links available. This is known as federated search service provided by LMS provider because of the growing of e-collection and to bring resource together to library users. Deddens (2002) stated that multiple database searching Integrated Library System (ILS) crucial in information retrieval. Library in this era are concern about material access and some libraries will do one time purchase of electronic book for example with unlimited access of single book

2.6 Greater flexibility

Administration menu for Library Management System allows system administrator (Automation Librarian) to set some parameters for staff and students access. According to Ping and Fitzgerald (2013). administrator module allows system administrator to create system user as well as set up patron type, create item location relating to library policies.

2.7 Interface

Focusing on accessibility of the material is the main priority in the library environment. The ability of the current LMS provide live circulation status and change in local records is considered as advantage to the library (Yang, 2013). Real time status displayed interface facilitates user to identify whether items are still available or not. Other than that, Archana, Padmakumar and Beena (2014) mentioned about interfaces for access point of searching where it can be done via information such as the author, title, keyword and many more. In their paper, they stated that different LMS will provide different access point.

2.8Integrate effort within library departments.

In order to facilitate the workflow and the process within the library, the usage of Integrated Library System is seem as the best platform to execute all of its process. Modules available in Integrated Library System such as Acquisition, Cataloguing. Serial and Circulation allow one item to be reviewed and processed by various departments within the library.

Acquisition department for example will manage the purchasing of material for the library. With evolution of integrated library system, invoice system embedded to assist acquisition unit with the purchasing process. Data will be stored in ILS server either in its physical form or in cloud. Beside the acquisition department, the next process will be done by cataloguing unit where they will complete the simple MARC record of the material purchased by acquisition or serial department. Using ILS as a method of cataloguing, 239.50 allows for copy cataloguing to be executed by the library. This allows librarian to speed up their cataloguing process daily.

2.9Easy retrieve information needed

Storing the information of material in library management system allows librarian or staff to casily locate the needed information for their patron. With the development of WebOPAC such as VTLS Virtus iPortal, it allows client to search for needed information based on record inserted in the Library Management System. Besides assisting user in finding the information they need, WebOPAC also have other function which allow patron to request the item needed as well as reservation of material. This is also part of Library Management System (LMS) for user to retrieve material that they need.

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Chapter 3. Analysis

3.1 Introduction

Library management system project website used to maintain all activities of library system such as maintain books stock, issue book records, return book records, student detail and also keep data of penalty for late return books. The project covered all activities which has done to run library system.

In this chapter, we will discuss and analyze about the developing process of Library Management System including software requirement specification (SRS) and comparison between existing and proposed system. The functional and non-functional requirements are included in SRS part to provide complete description and overview of system requirement before the developing process is carried out. Besides that, existing vs proposed provides a view of how the proposed system will be more efficient than the existing one.

3.2 System Specifications

3.2.1 Hardware Requirements: -

- Pentium-IV(Processor).
- 4 GB Ram
- 512 KB Cache Memory
- Hard disk 10 GB
- Microsoft Compatible 101 or more Key Board

3.2.2 Software Requirements: -

- **Operating System** **:** Windows (Any version above XP)
- **Programming language:** .NET4.0, VISUAL STUDIO2019
- **Web-Technology** **:** ASP.NET
- **Back-End** **:** SQL SERVER 2016
- **Web Server** **:** IIS.

3.3 SYSTEM REQUIREMENTS

3.3.1 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

The system should accurately perform 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.

ORGANIZATIONAL REQUIREMENT

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

3.3.2 FUNCTIONAL REQUIREMENTS

1. NORMAL USER

1.1 USER LOGIN

Description of feature: 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.

1.2 REGISTER NEW USER

Description of feature: This feature can be performed by all users to register new user to create account. Functional requirements -System must be able to verify information -System must be able to delete information if information is wrong

1.3 REGISTER NEW BOOK

Description of feature: 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.

1.4 SEARCH BOOK

Description of Feature: 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 Functional requirements -System should be able to add detailed information about events. -System should be able to display information on notice board available in the homepage of site

Chapter 4. System Design

4.1 Introduction

Design is the first step in the development phase for any techniques and principles for the purpose of defining a device, a process or system in sufficient detail to permit its physical realization.

Once the software requirements have been analyzed and specified the software design involves three technical activities - design, coding, implementation and testing that are required to build and verify the software.

4.2 UML DIAGRAMS

Actor:

A coherent set of roles that users of use cases play when interacting with the use cases.

Use case:

A description of sequence of actions, including variants, that a system performs that yields an observable result of value of an actor.

UML stands for Unified Modeling Language.

There are various kinds of methods in software design:

They are as follows:

- Use case Diagram
- Sequence Diagram
- Activity Diagram

4.2.1 SEQUENCE DIAGRAM:

Sequence diagram and collaboration diagram are called INTERACTION DIAGRAMS. An interaction diagram shows an interaction, consisting of set of objects and their relationship including the messages that may be dispatched among them.

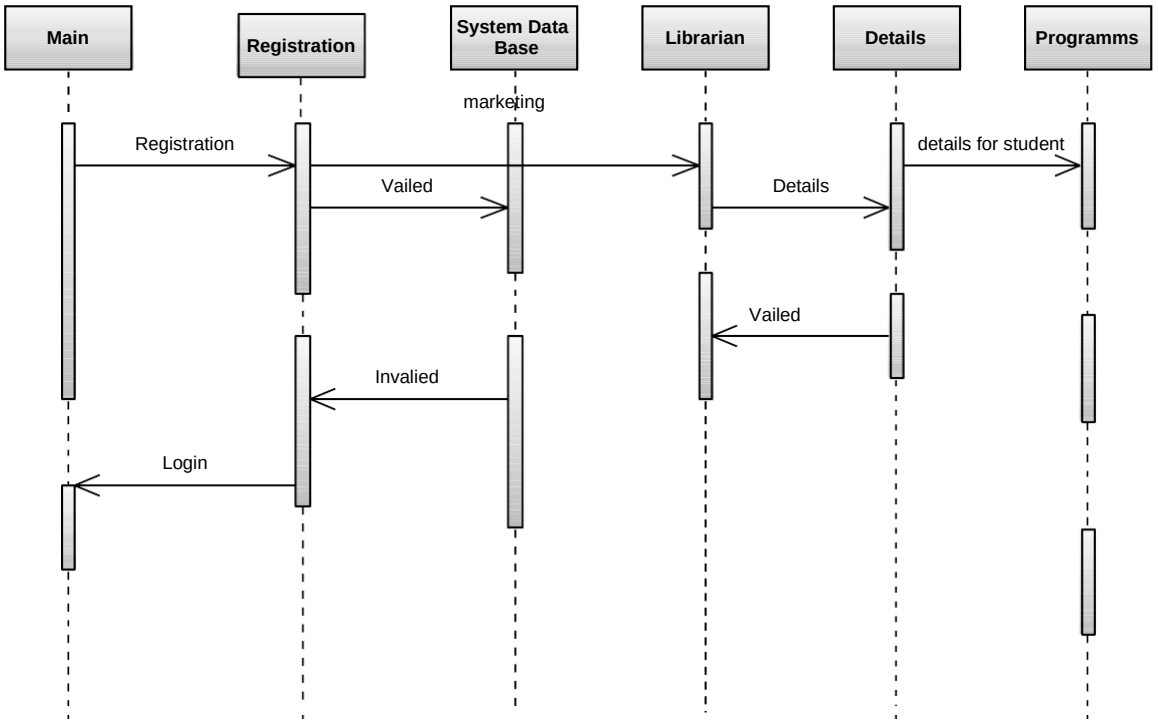


Fig 4.1 sequence diagram.

4.2.2 ACTIVITY DIAGRAM:

The activity diagram used to describe flow of activity through a series of actions. Activity diagram is a important diagram to describe the system. The activity described as an action or operation of the system.

Librarian Activity:

- Add Publication
- Add books
- Add Branch
- Add Student
- Issue Book
- Return Book
- Apply Penalty
- Change Password
- Issue Book
- Return Book
- Apply Penalty
- Change Password
- View Reports

Student Activity:

- Search Book
- Issue / Return Book Report
- Penalty Report
- Change Password

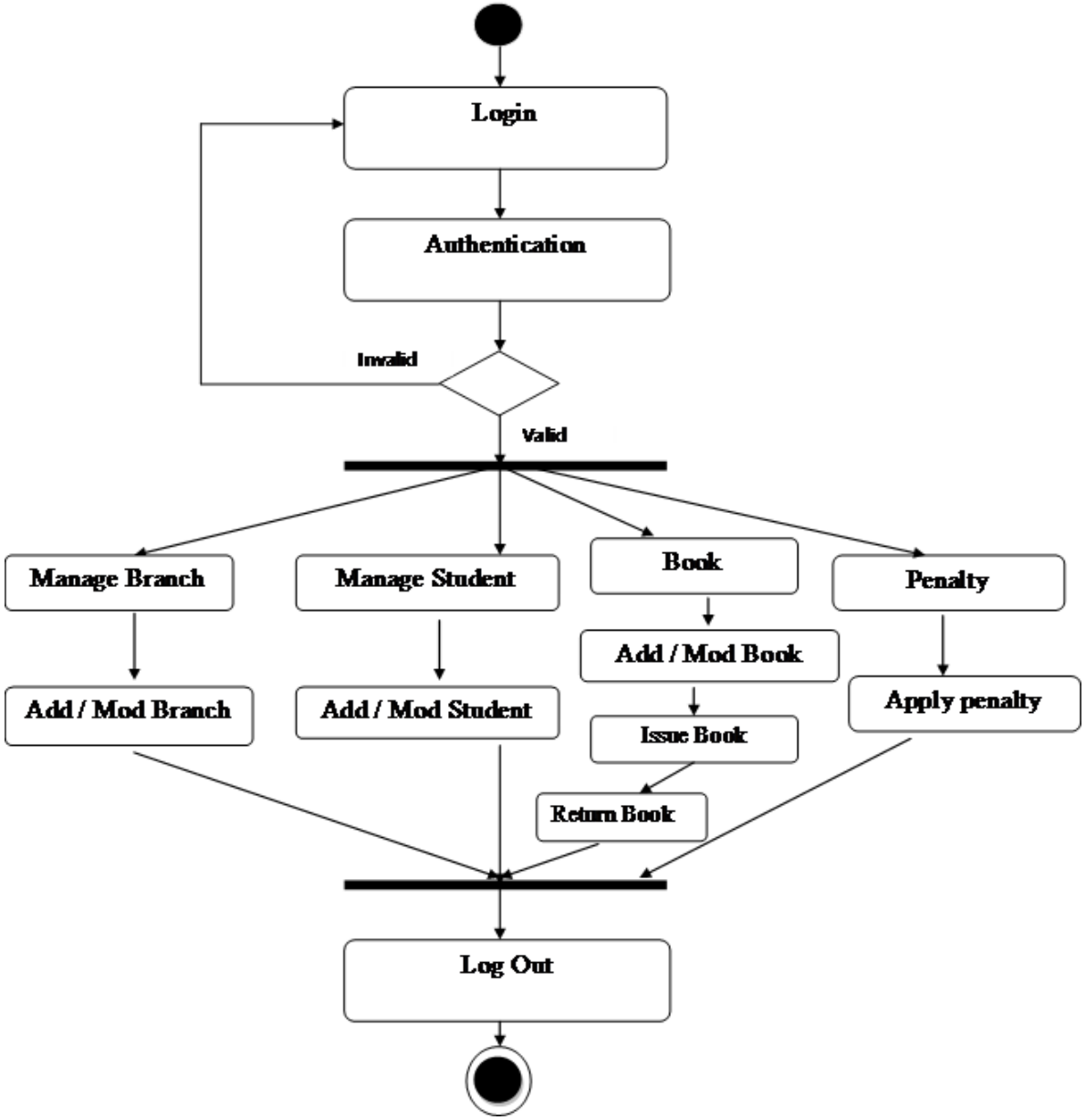


Fig 4.1 activity diagram

4.2.3 USECASE DIAGRAM:

Use case:

A description of sequence of actions, including variants, that a system performs that yields an observable result of value of an actor.

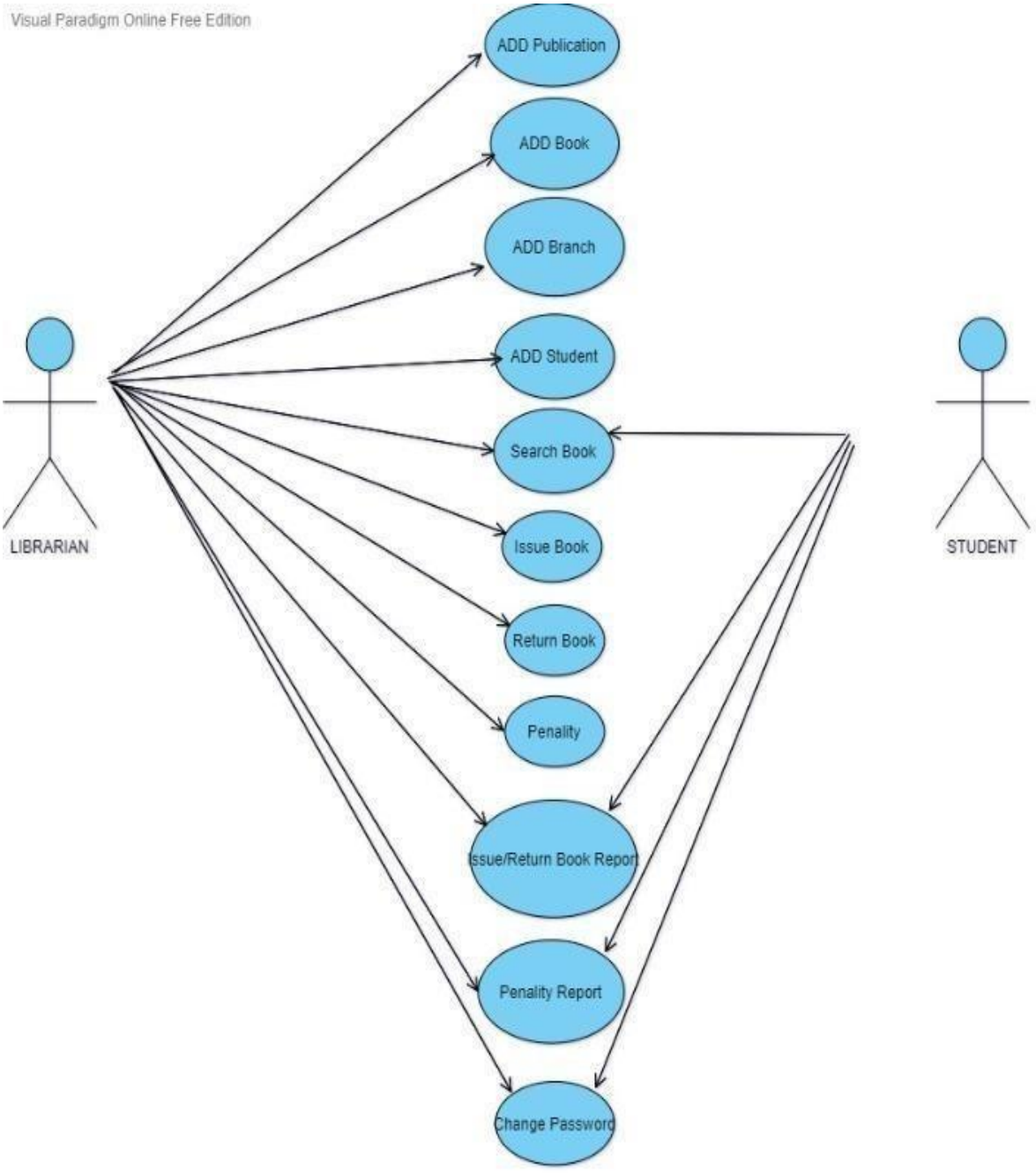


Fig 4.2 use case diagram

4.3 DATA FLOW DIAGRAMS

The DFD takes an input-process-output view of a system i.e. data objects flow into the software, are transformed by processing elements, and resultant data objects flow out of the software.

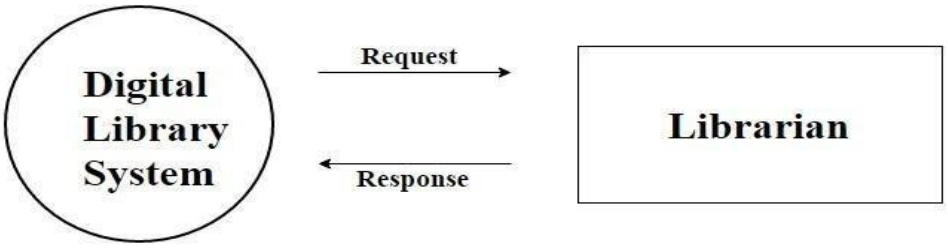
Data objects represented by labeled arrows and transformation are represented by circles also called as bubbles. DFD is presented in a hierarchical fashion i.e. the first data flow model represents the system as a whole. Subsequent DFD refine the context diagram (level 0 DFD), providing increasing details with each subsequent level.

The DFD enables the software engineer to develop models of the information domain & functional domain at the same time. As the DFD is refined into greater levels of details, the analyst performs an implicit functional decomposition of the system. At the same time, the DFD refinement results in a corresponding refinement of the data as it moves through the process that embody the applications.

A context-level DFD for the system the primary external entities produce information for use by the system and consume information generated by the system. The labeled arrow represents data objects or object hierarchy.

RULES FOR DFD:

- Fix the scope of the system by means of context diagrams.
- Organize the DFD so that the main sequence of the actions .
- Identify all inputs and outputs.
- Identify and label each process internal to the system with Rounded circles.
- A process is required for all the data transformation and Transfers. Therefore, never connect a data store to a data Source or the destinations or another data store with just a Data flow arrow.
- Do not indicate hardware and ignore control information.
- Make sure the names of the processes accurately convey everything the process is done.
- Number each occurrence of repeated external entities.



0 Level DFD

1 LEVEL DFD

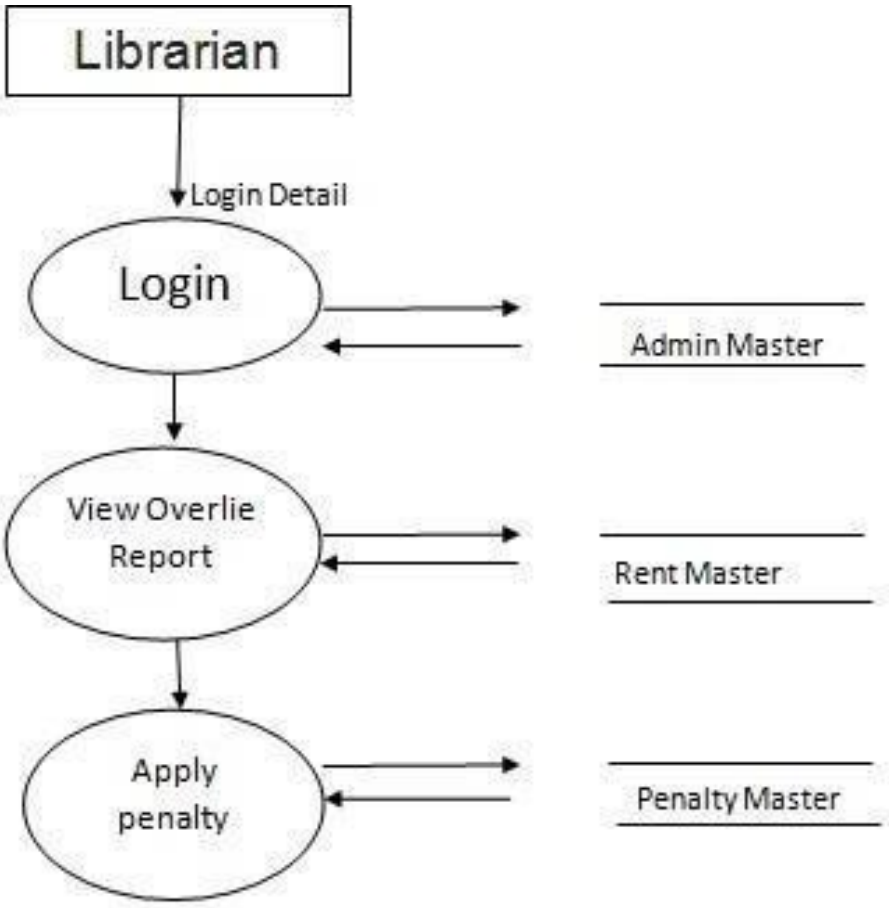


Fig 4.3 data flow

Chapter 5. Detailed Design

5.1 MODULES USED: -

The proposed system categories and follows these modules to implement

Login component

1. Administrator (Head office manager)
2. Librarian
3. User

Administrator Component

1. Administrator

Librarian Manager Component

1. Librarian Manager

Student Component

1. Books Details
2. Issue Details

5.2 MODULES DESCRIPTION: -

User: Using login id and password user can the use Library online where users can search for books and renewal books online. They can recommend for new books by just sending messages to the librarian from anywhere in the college. They can view the issue and return dates of any book and due they have to pay.

Registration: In the Registration module, user has to register himself by supplying his personal information which gets store in data base which are using as backend. By registering himself user will get his login id and Password so that he can access Library online. Separate Register form should be designed for separate user

(Student, Faculty, Librarian) and separate login has to provide for each user. For example, if the users are students, then student id should be SH001.

Librarian: Librarian is a responsible person who run the system, is an administrator of the whole system. Librarian has a full right to handle the project.

Librarian Functionalities:

Here is the list of activities of librarian.

- Add Publication
- Add Book Stock
- Add Branch
- Add Student
- Issue Books
- Return Books
- Penalty

The Librarian has a username and password to access the system. After login he has to first add publication detail in to system and then enter all the detail of book stock. In our system librarian can make entry of student who are the members of our system. Librarian can register all students with valid personal detail and generate username and password for each student for login into system. Librarian issue books to registered student and get return from them. He has rights to make a penalty for late return book.

Student / Member Functionalities:

- Book Reports
- Penalty Status
- Account

The student is a registered member of library system. All student has unique username and password to access his account. After login student can access his account detail, they can see the borrowed book report and penalty report.

5.3 FLOWCHART

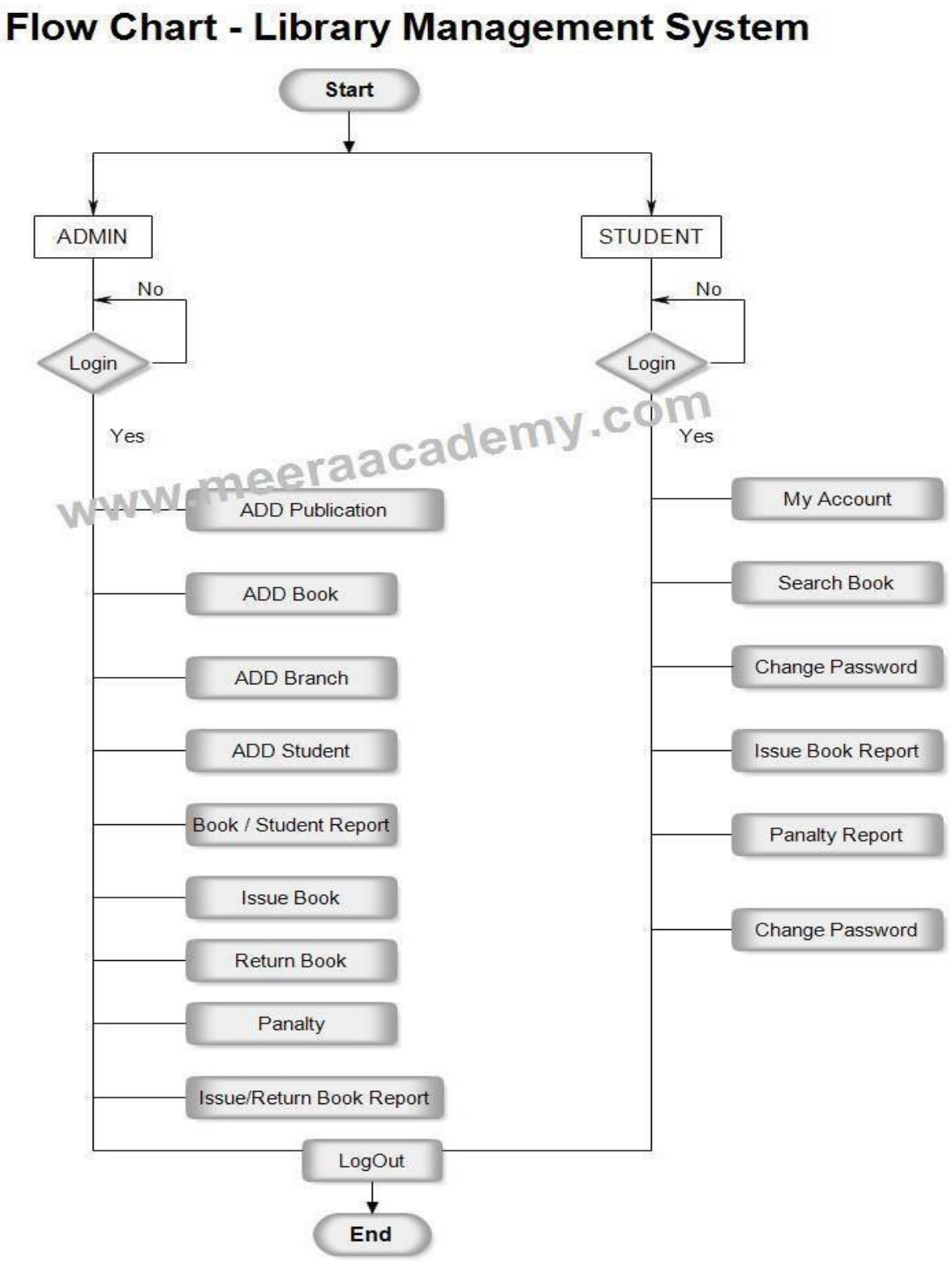


Fig 5.1 Flow chart

Chapter 6. Implementation Details

6.1 Introduction:

Implementation is the stage where the theoretical design is turned into a working system. The most crucial stage in achieving a new successful system and in giving confidence on the new system for the users that it will work efficiently and effectively.

The system can be implemented only after thorough testing is done and if it is found to work according to the specification.

It involves careful planning, investigation of the current system and its constraints on implementation, design of methods to achieve the changeover and an evaluation of change over methods a part from planning. Two major tasks of preparing the implementation are education and training of the users and testing of the system.

The more complex the system being implemented, the more involved will be the systems analysis and design effort required just for implementation.

The implementation phase comprises of several activities. The required hardware and software acquisition is carried out. The system may require some software to be developed. For this, programs are written and tested. The user then changes over to his new fully tested system and the old system is discontinued.

6.2 OVERVIEW OF TECHNOLOGIES USED

6.2.1 Front End Technology

6.2.1.1 MICROSOFT .NET FRAMEWORK

The .NET Framework is a new computing platform that simplifies application development in the highly distributed environment of the Internet. The .NET Framework is designed to fulfill the following objectives:

- To provide a consistent object-oriented programming environment whether object code is stored and executed locally, executed locally but Internet-distributed, or executed remotely.
- To provide a code-execution environment that minimizes software deployment and versioning conflicts.
- To provide a code-execution environment that guarantees safe execution of code, including code created by an unknown or semi-trusted third party.
- To provide a code-execution environment that eliminates the performance problems of scripted or interpreted environments.
- To make the developer experience consistent across widely varying types of applications, such as Windows-based applications and Web-based applications.
- To build all communication on industry standards to ensure that code based on the .NET Framework can integrate with any other code.

The .NET Framework has two main components: the common language runtime and the .NET Framework class library. The common language runtime is the foundation of the .NET Framework.

For example, ASP.NET hosts the runtime to provide a scalable, server-side environment for managed code. ASP.NET works directly with the runtime to enable Web Forms applications and XML Web services.

Database

A database is similar to a data file in that it is a storage place for data. Like a data file, a database does not present information directly to a user; the user runs an application that accesses data from the database and presents it to the user in an understandable format.

A database typically has two components: the files holding the physical database and the database management system (DBMS) software that applications use to access

data. The DBMS is responsible for enforcing the database structure, including:

- Maintaining the relationships between data in the database.
- Ensuring that data is stored correctly and that the rules defining data relationships are not violated.
- Recovering all data to a point of known consistency in case of system failures.

Client/Server: -

- In a client/server system, the server is a relatively large computer in a central location that manages a resource used by many people. When individuals need to use the resource, they connect over the network from their computers, or clients, to the server.
- Examples of servers are: In a client/server database architecture, the database files and DBMS software reside on a server. A communications component is provided so applications can run on separate clients and communicate to the database server over a network. The SQL Server communication component also allows communication between an application running on the server and SQL Server.
- Server applications are usually capable of working with several clients at the same time. SQL Server can work with thousands of client applications simultaneously. The server has features to prevent the logical problems that occur if a user tries to read or modify data currently being used by others.
- While SQL Server is designed to work as a server in a client/server network, it is also capable of working as a stand-alone database directly on the client. The scalability and ease-of-use features of SQL Server allow it to work efficiently on a client without consuming too many resources.

.NET Framework Class Library: -

The .NET Framework class library is a collection of reusable types that tightly integrate with the common language runtime. The class library is object oriented, providing types from which your own managed code can derive functionality.

For example, you can use the .NET Framework to develop the following types of applications and services:

- Console applications.
- Scripted or hosted applications.
- Windows GUI applications (Windows Forms).
- ASP.NET applications.
- XML Web services.
- Windows services.

For example, the Windows Forms classes are a comprehensive set of reusable types that vastly simplify Windows GUI development. If you write an ASP.NET Web Form application, you can use the Web Forms classes.

6.2.2 Active Server Pages.NET: -

ASP.NET is a programming framework built on the common language runtime that can be used on a server to build powerful Web applications. ASP.NET offers several important advantages over previous Web development models:

- World-Class Tool Support:
- Power and Flexibility
- Enhanced Performance
- Simplicity
- Manageability
- Scalability and Availability
- Customizability and Extensibility
- Security

Language Support

The Microsoft .NET Platform currently offers built-in support for three languages: C#, Visual Basic, and JScript.

What is ASP.NET Web Forms?

The ASP.NET Web Forms page framework is a scalable common language runtime programming model that can be used on the server to dynamically generate Web pages.

a. BACK-END TECHNOLOGY:

6.3.1 About Microsoft SQL Server 2016

Microsoft SQL Server is a Structured Query Language (SQL) based, client/server relational database. Each of these terms describes a fundamental part of the architecture of SQL Server.

Database

A database is similar to a data file in that it is a storage place for data. Like a data file, a database does not present information directly to a user; the user runs an application that accesses data from the database and presents it to the user in an understandable format.

A database typically has two components: the files holding the physical database and the database management system (DBMS) software that applications use to access data. The DBMS is responsible for enforcing the database structure, including:

- Maintaining the relationships between data in the database.
- Ensuring that data is stored correctly and that the rules defining data relationships are not violated.
- Recovering all data to a point of known consistency in case of system failures.

SQL Server Features

Microsoft SQL Server supports a set of features that result in the following benefits:

Ease of installation, deployment, and use

SQL Server includes a set of administrative and development tools that improve your ability to install, deploy, manage, and use SQL Server across several sites.

Scalability

The same database engine can be used across platforms ranging from laptop computers running Microsoft Windows® to large, multiprocessor servers running Microsoft Windows NT®, Enterprise Edition.

Data warehousing

SQL Server includes tools for extracting and analyzing summary data for online analytical processing (OLAP). SQL Server also includes tools for visually designing databases and analyzing data using English-based questions.

System integration with other server software

SQL Server integrates with e-mail, the Internet, and Windows.

When dealing with connections to a database, there are two different options: SQL Server .NET Data Provider (System.Data.SqlClient) and OLE DB .NET Data Provider (System.Data.OleDb). In these samples we will use the SQL Server .NET Data Provider. These are written to talk directly to Microsoft SQL Server. The OLE DB .NET Data Provider is used to talk to any OLE DB provider (as it uses OLE DB underneath).

Connections

Connections are used to 'talk to' databases, and are represented by provider-specific classes such as SQLConnection. Commands travel over connections and result sets are returned in the form of streams which can be read by a Data Reader object, or pushed into a Dataset object.

Data Adapters (OLEDB/SQL)

The Data Adapter object works as a bridge between the Dataset and the source data. Using the provider-specific SqlDataAdapter (along with its associated SqlCommand and SqlConnection) can increase overall performance when working with a Microsoft SQL Server database. For other OLE DB-supported databases, you would use the OleDbDataAdapter object and its associated OleDbCommand and OleDbConnection objects. The Data Adapter object uses commands to update the data source after changes have been made to the Dataset. Using the Fill method of the Data Adapter calls the SELECT command; using the Update method calls the INSERT, UPDATE or DELETE command for each changed row.

6.3.2 C# Language

C# (pronounced C Sharp) is a multi-paradigm programming language that encompasses functional, imperative, generic, object-oriented (class-based), and component-oriented programming disciplines. It was developed by Microsoft as part of the .NET initiative and later approved as a standard by ECMA (**ECMA-334**) and ISO (**ISO/IEC 23270**). C# is one of the 44 programming languages supported by the .NET Framework's Common Language Runtime.

C# is intended to be a simple, modern, general-purpose, object-oriented programming language. Anders Hejlsberg, the designer of Delphi, leads the team which is developing C#. It has an object-oriented syntax based on C++ and is heavily influenced by other programming languages such as Delphi and Java. It was initially named Cool, which stood for "C like Object Oriented Language". However, in July 2000, when Microsoft made the project public, the name of the programming language was given as C#. The most recent version of the language is C# 4.8 which was released in conjunction with the .NET Framework. The next proposed version, C# 4.0, is in development.

Some notable C# distinguishing features are:

- There are no global variables or functions. All methods and members must be declared within classes.
- Local variables cannot shadow variables of the enclosing block, unlike C and C++. Variable shadowing is often considered confusing by C++ texts.
- C# supports a strict Boolean data type, bool. Statements that take conditions, such as while and if, require an expression of a Boolean type.
- In C#, memory address pointers can only be used within blocks specifically marked as *unsafe*, and programs with unsafe code need appropriate permissions to run.
- Managed memory cannot be explicitly freed, but is automatically garbage collected. Garbage collection addresses memory leaks. C# also provides direct support for deterministic finalization with the using statement (supporting the Resource Acquisition Is Initialization idiom).
- Multiple inheritance is not supported, although a class can implement any number of interfaces.

- C# is more type safe than C++. The only implicit conversions by default are those which are considered safe, such as widening of integers and conversion from a derived type to a base type.
- Enumeration members are placed in their own scope.
- C# provides syntactic sugar for a common pattern of a pair of methods, accessor (getter) and mutator (setter) encapsulating operations on a single attribute of a class, in form of properties.
- Full type reflection and discovery is available.

b. Pseudo Code

6.4.1 Connecting To SQL SERVER

```
<?xml version="1.0"?>
<!--
  For more information on how to configure your ASP.NET application, please
visit
  http://go.microsoft.com/fwlink/?LinkId=169433
  -->
<configuration>
       <connectionStrings>
  <add        name="LibrarySystemConnectionString"        connectionString="Data
Source=LAPTOP-OSI8RUB5\SQLEXPRESS;Initial       Catalog=LibrarySystem;Integrated
Security=True"
    providerName="System.Data.SqlClient" />
 </connectionStrings>
 <system.web>
              <compilation debug="true" targetFramework="4.0"/>
       </system.web>
</configuration>
```

Chapter 7. Testing

Testing is a process of executing a program with the intent of finding an error. Testing is a crucial element of software quality assurance and presents ultimate review of specification, design and coding.

System Testing is an important phase. Testing represents an interesting anomaly for the software. Thus, a series of testing are performed for the proposed system before the system is ready for user acceptance testing.

A good test case is one that has a high probability of finding an as undiscovered error. A successful test is one that uncovers an as undiscovered error.

The primary objective for test case design is to derive a set of tests that has the highest livelihood for uncovering defects in software. To accomplish this objective two different categories of test case design techniques are used. They are

- White box testing.
- Black box testing.

WHITE-BOX TESTING:

White box testing focus on the program control structure. Test cases are derived to ensure that all statements in the program have been executed at least once during testing and that all logical conditions have been executed.

BLACK-BOX TESTING:

Black box testing is designed to validate functional requirements without regard to the internal workings of a program. Black box testing mainly focuses on the information domain of the software, deriving test cases by partitioning input and output in a manner that provides through test coverage. Incorrect and missing functions, interface errors, errors in data structures, error in functional logic are the errors falling in this category.

c. Unit testing:

Unit testing is essential for the verification of the code produced during the coding phase and hence the goal is to test the internal logic of the modules. Using the detailed design description as a guide, important paths are tested to uncover errors with in the boundary of the modules. These tests were carried out during the programming stage itself. All units of Vienna SQL were successfully tested.

d. Integration testing:

Integration testing focuses on unit tested modules and build the program structure that is dictated by the design phase.

e. System testing:

System testing tests the integration of each module in the system. It also tests to find discrepancies between the system and it's original objective, current specification and system documentation. The primary concern is the compatibility of individual modules. Entire system is working properly or not will be tested here, and specified path ODBC connection will correct or not, and giving output or not are tested here these verifications and validations are done by giving input values to the system and by comparing with expected output. Top-down testing implementing here.

f. Acceptance Testing:

This testing is done to verify the readiness of the system for the implementation. Acceptance testing begins when the system is complete. Its purpose is to provide the end user with the confidence that the system is ready for use. It involves planning and execution of functional tests, performance tests and stress tests in order to demonstrate that the implemented system satisfies its requirements.

Tools to special importance during acceptance testing include:

Test coverage Analyzer – records the control paths followed for each test case.

Timing Analyzer – also called a profiler, reports the time spent in various regions of the code are areas to concentrate on to improve system performance.

Coding standards – static analyzers and standard checkers are used to inspect code for deviations from standards and guidelines.

g. Test Cases:

The test case specification for system testing has to be submitted for review before system testing commences.

LOGIN FORM:

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

BOOK ENTRY FORM:

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

USER ACCOUNT FOR/1:

S1 No	Test Case	Exoepted Result	Tert **Result**
1	On the click of ADD button	At first user have to **fill all fields** with **proper** data , if any **Error** like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds **Record To the** Database	successful
2.	On the Click of DELETE Button	This deletes the details of studem by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH BuHon	Displays the Details of book for entered Register no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	**successfu**
7.	On the Click of NEXT button	Display the next form	

BOOK ISSUE FORM:

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

BOOK RETURN FORM:

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

Chapter 8. Results

Fig 8.1 LOGIN PAGE

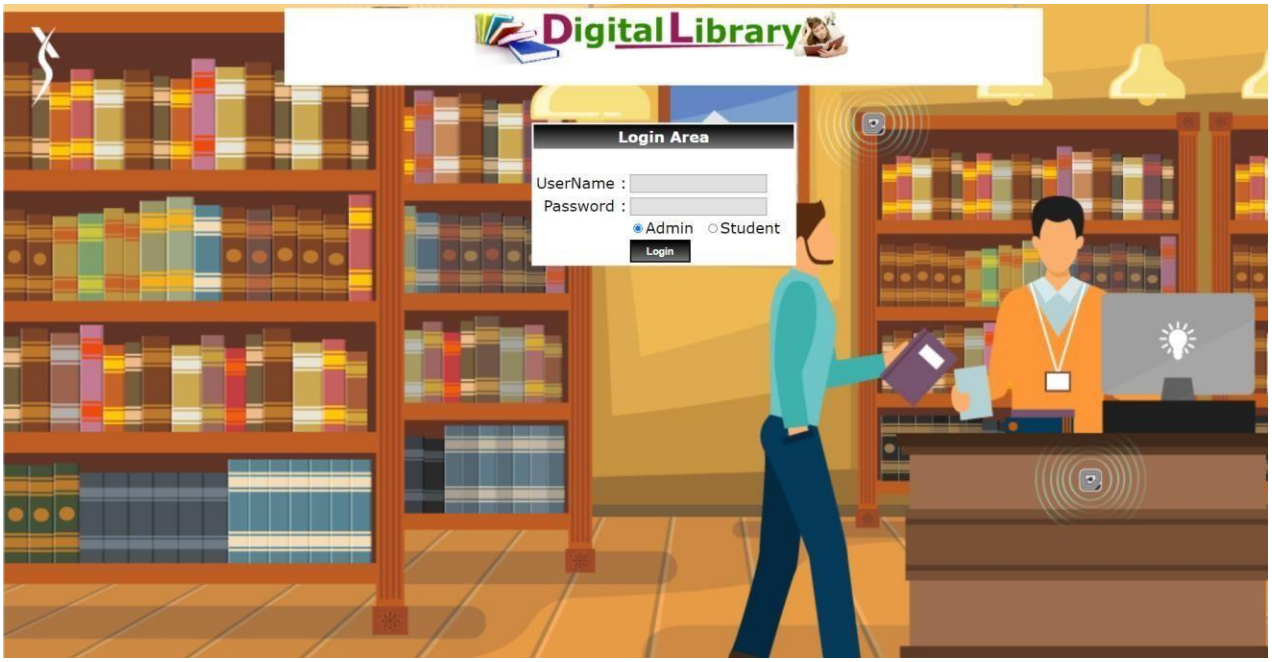


Fig 8.2 HOME PAGE

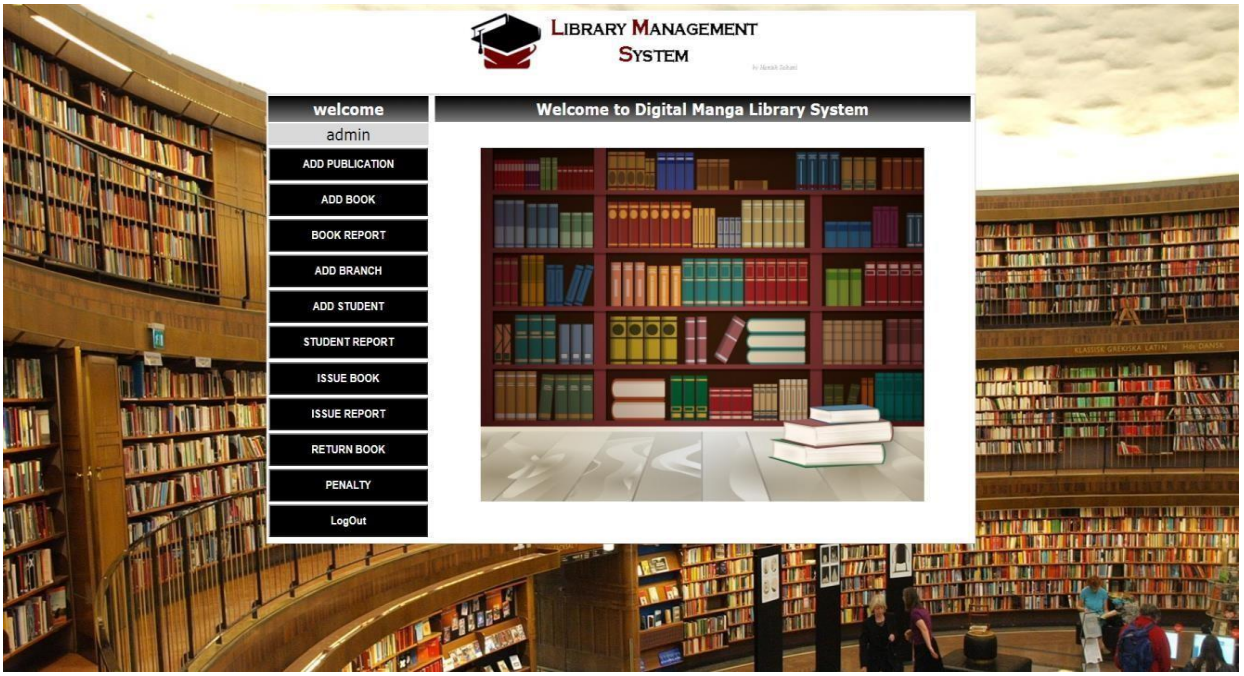


Fig 8.3BOOK REPORT

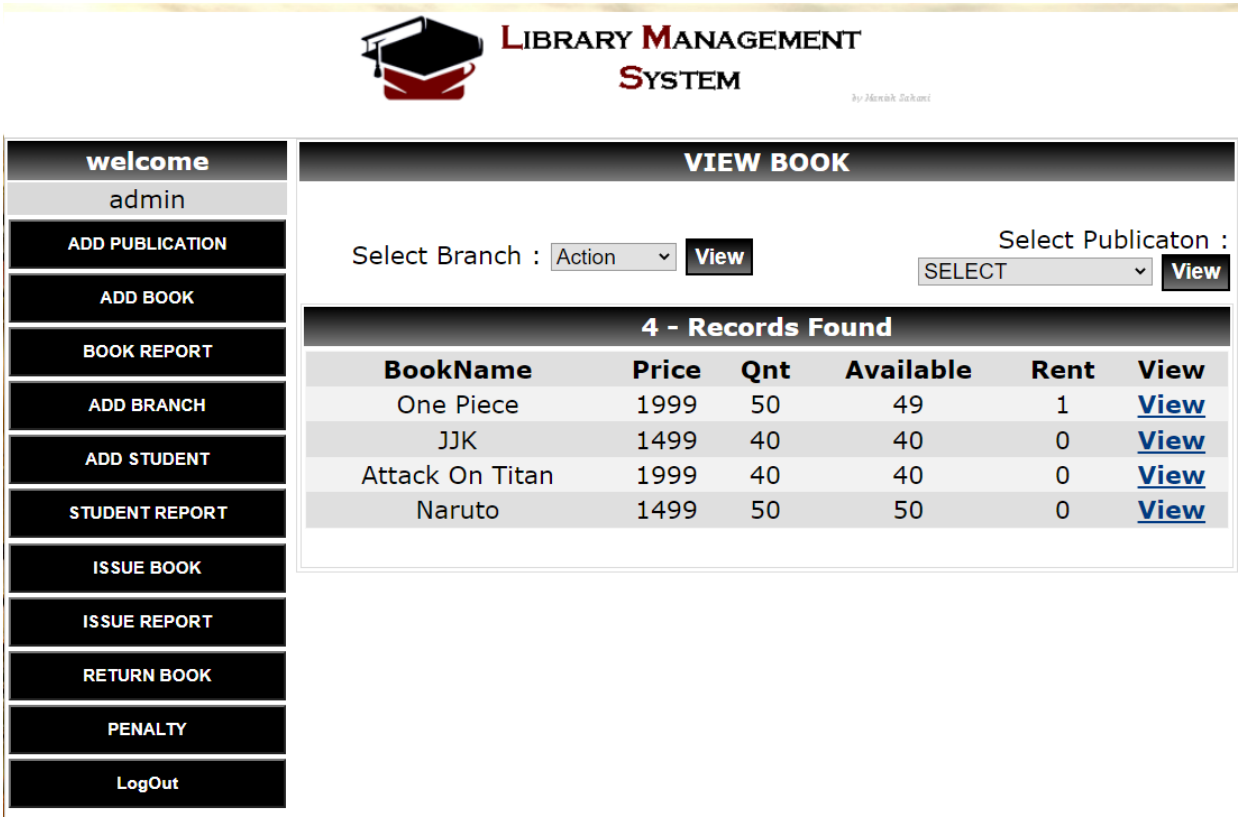


Fig 8.4BOOK ISSUE

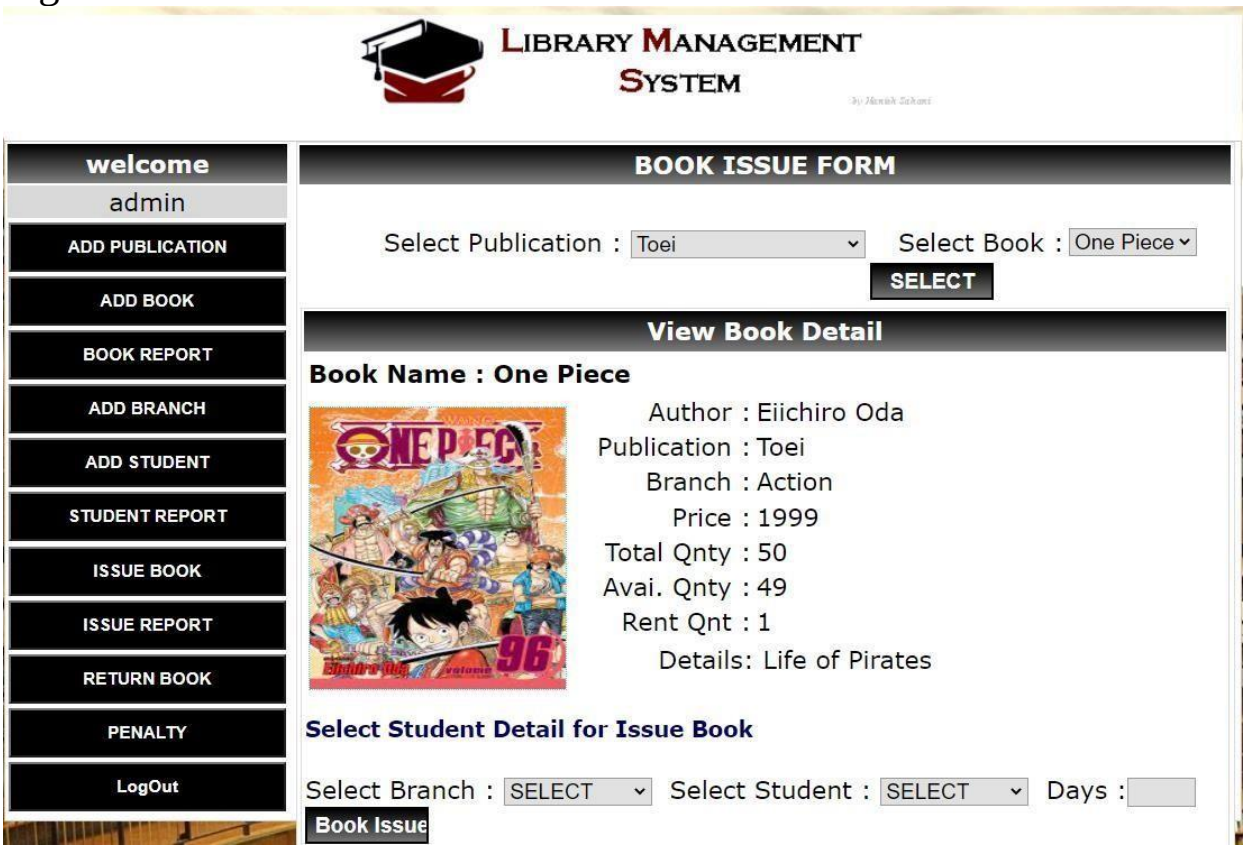


Fig 8.5 BOOK RETURN FORM

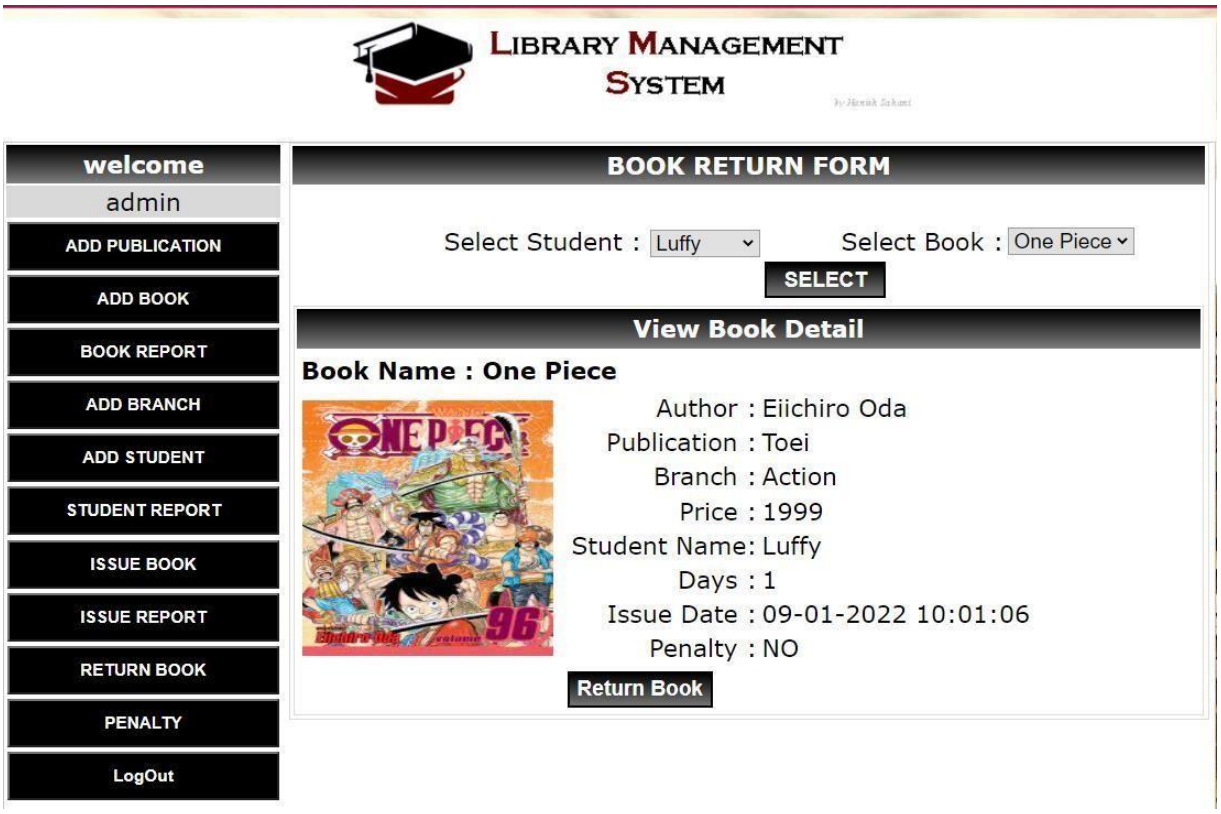


Fig 8.6 ISSUE REPORT

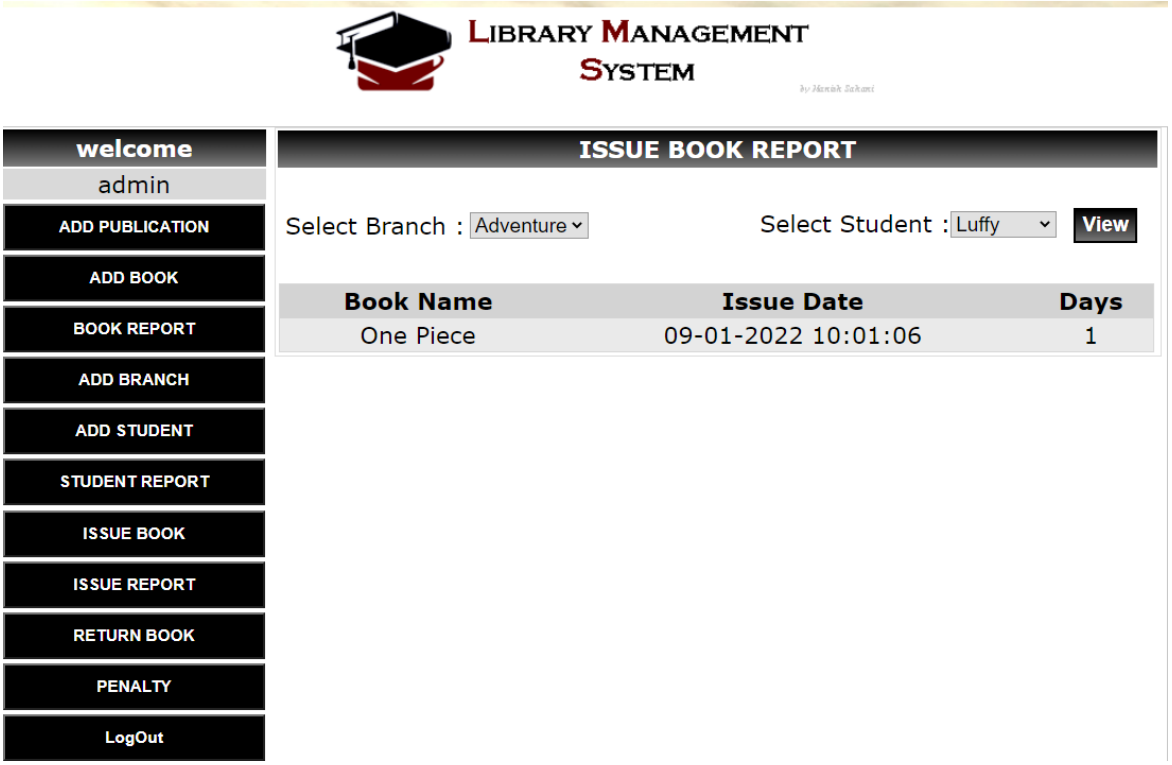


Fig 8.7 STUDENT REPORT

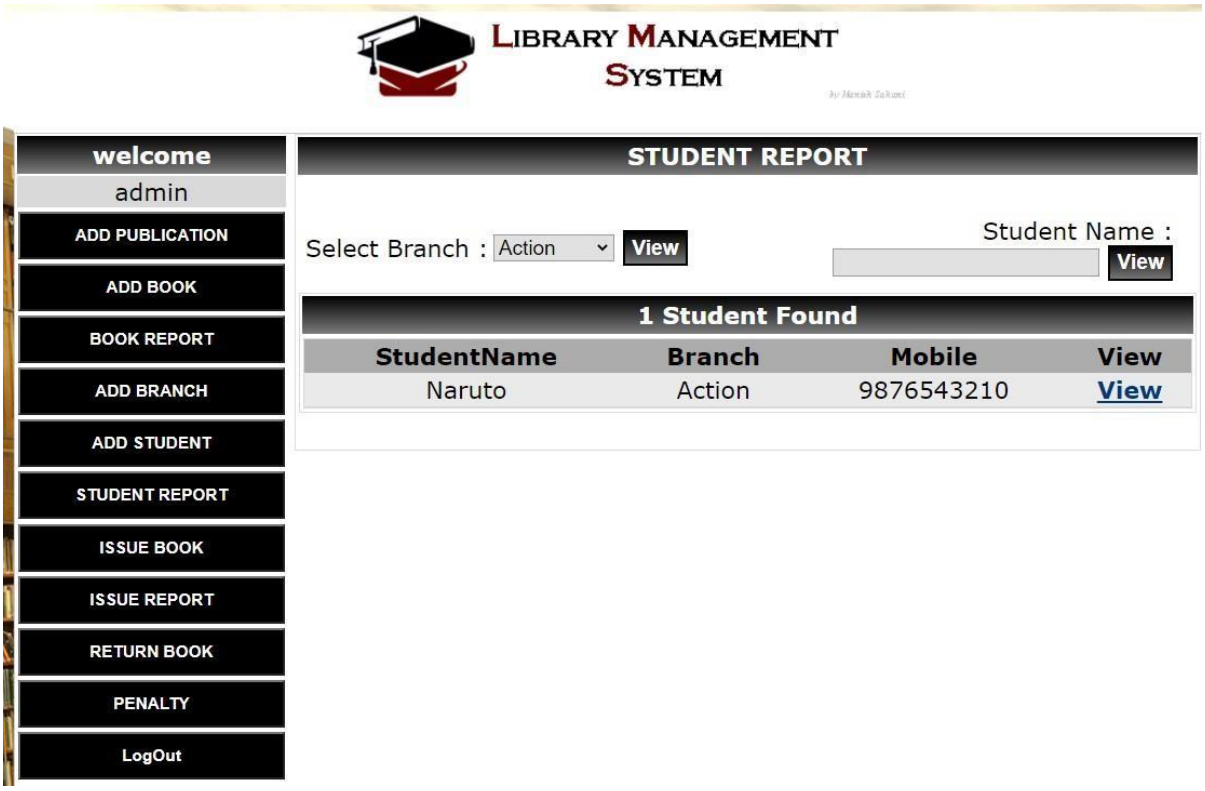


Fig 8.8 STUDENT HOME PAGE

Fig 8.9 STUDENT'S BOOK REPORT

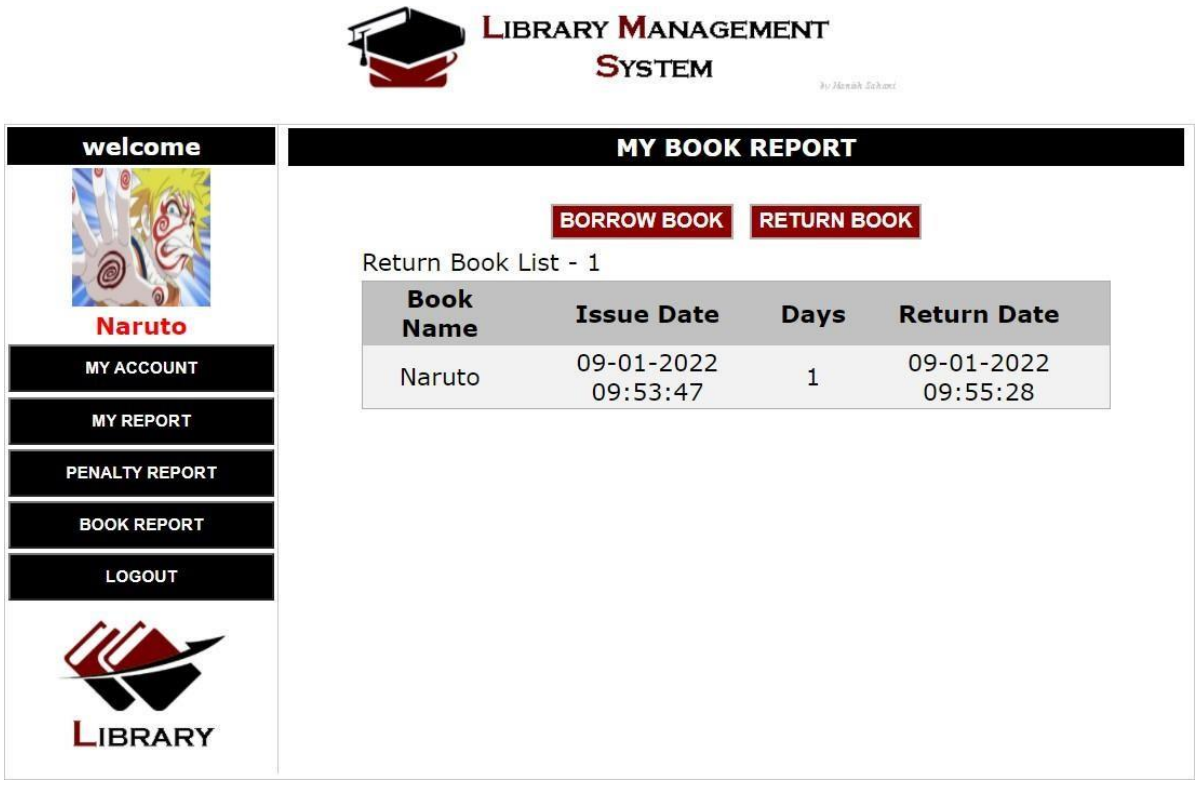
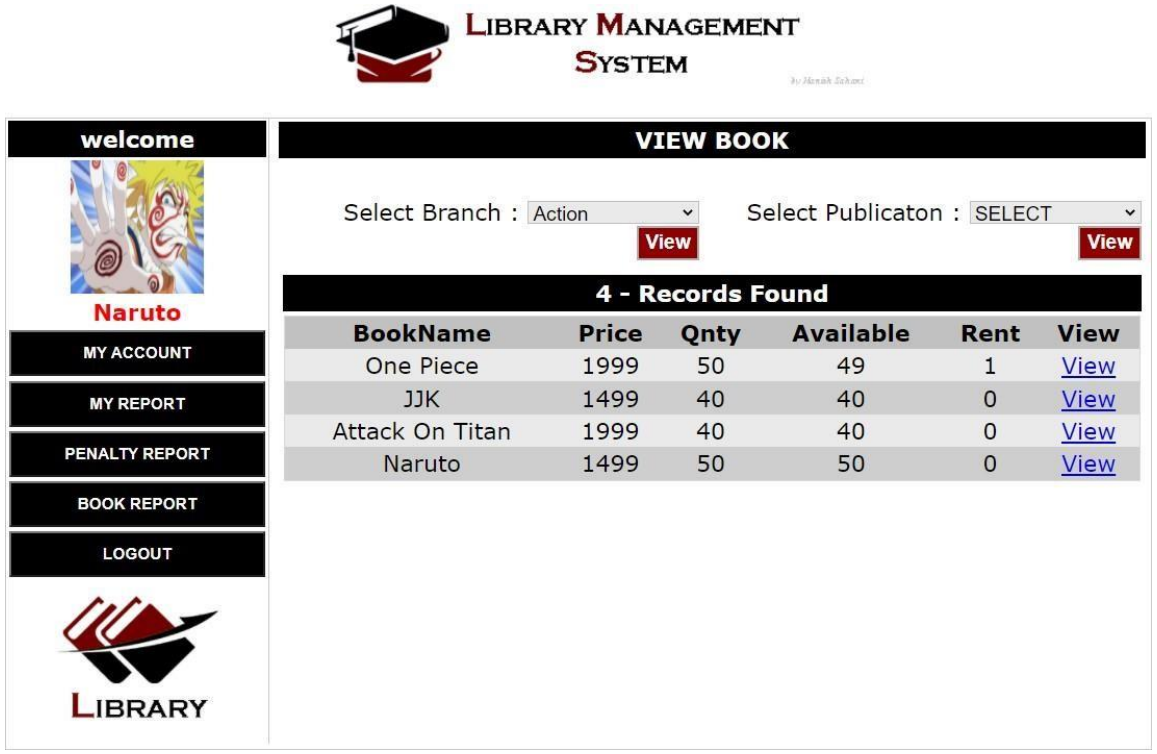


Fig 8.10BOOK REPORT 2



Chapter 9. Conclusion and future work

a. CONCLUSION

The package was designed in such a way that future modifications can be done easily. The following conclusions can be deduced from the development of the project.

i. Library Management System of the entire system improves the efficiency.
ii. It provides a friendly graphical user interface which proves to be better when compared to the existing system.
iii. It gives appropriate access to the authorized users depending on their permissions.
iv. It effectively overcomes the delay in communications.
v. Updating of information becomes so easier.
vi. System security, data security and reliability are the striking features.
vii. The System has adequate scope for modification in future if it is necessary.

b. FUTURE WORK:

This application avoids the manual work and the problems concern with it. It is an easy way to obtain the information regarding the various products information that are present in the library of a particular college.

Well, I and my team members have worked hard in order to present an improved website better than the existing one's regarding the information about the various activities. Still, we found out that the project can be done in a better way. Primarily, when we request information about a particular product it just shows the company, product id, product name and no. of quantities available. So, after getting the information we can get access to the product company website just by a click on the product name.

The next enhancement that we can add the searching option. We can directly search to the particular product company from this site. These are the two enhancements that we could think of at present.