Demo Project Book for-
Library Book Tracker Android App

Chapter 1-4
Introduction to Design Part

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A library requires a proper arrangement and placement of books. That makes it easy for the user to find a particular book. But in very large libraries which have a huge collection, locating a particular book becomes a very difficult task.

Though all books are arranged in categories, but the location of category and books must be known at first so that the user gets to know where that particular category of books are placed. A user also needs to know about books availability, borrowed and returned books status etc. He/She may need to see any book preview.

In such a condition there needs to be a way through user can precisely locate the location of any book seeing graphically by just typing its name and get all the library facilities in a server base android application.Here we are proposing a server based system using an android application to achieve this task using internet or wifi technology.

1.2 Objectives

The objectives of this project is to providing a server based android app, improving the library management system features and reducing the access time of users.As this is a server based application, the users will remain updated about his/her activities of library such as books availability, graphical book location, borrowed/returned book status and penalty/fine status, requested books, notice of library, yearly book generate reports, etc. The library operator or librarian just needs to maintain the data server.For example: “The librarian can add or remove the book details, user details, issue/returned books details, etc and the location of a book in the system such as “3rd row | 5th column” and a map of the book along with it’s status will show weather it is located.” All this data is stored in the server. New members are provided an android application with an account which will be used for library related purpose. Users having internet or wifi connection will use the application and will get most of the library facilities in the app. The data server queries the database and show necessary things in the app what users wants to know. Thus it allows to automate the library book finding, availability checking, and the others functionalities of a library.

1.3 Existing System

1. Traditional Library System

Fig 1.3.1- Traditional Library System

Generally libraries are the place to preserve and distribute the physical forms of resources, such as books and magazines, journals, periodicals. To maintain these resources with cataloguing and classification. Physical Searching method is using to retrieve the resources. Information is stored in physical format. The users may be borrowed the resources and make use of it. A traditional library consist details of available stock in books and subscription of periodicals.

2. Web Based Library Management System

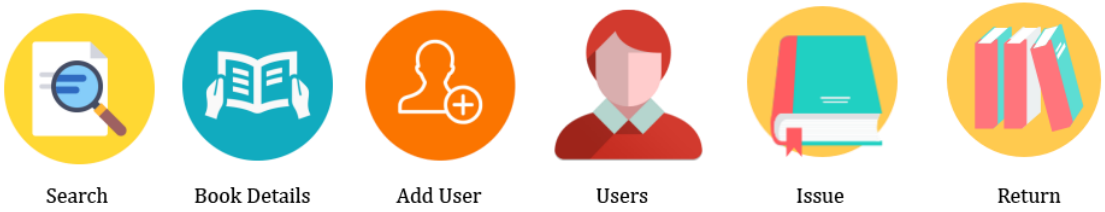


Fig 1.3.2- Web Based Library Management System

In Web Based Library Management System, there are different things which are maintained. They are - Keep the record of different categories like; Books, Journals, Newspapers, Magazines, etc. Classify the books subject wise. Keep the record of complete information of a book like; Book name, Author name, Publisher's name, Date/ Year of publication, Cost of the book, Book purchasing date/ Bill No. Fine calculation for late returns. Different criteria for searching a book. Different kind of reports like; total no. of books, no. of issued books, no. of journals, etc. How many books are issued to a particular student, etc.

1.4 Problems of Existing System

There are some problems of existing system which are mentioned below.

1. The First one is user interface problem. The user interface should be more responsive.
2. A user can not find specific book location easily.
3. The book searching process is so time consuming.
4. Book Issuing and Returning process is not better.
5. User can not check book availability.

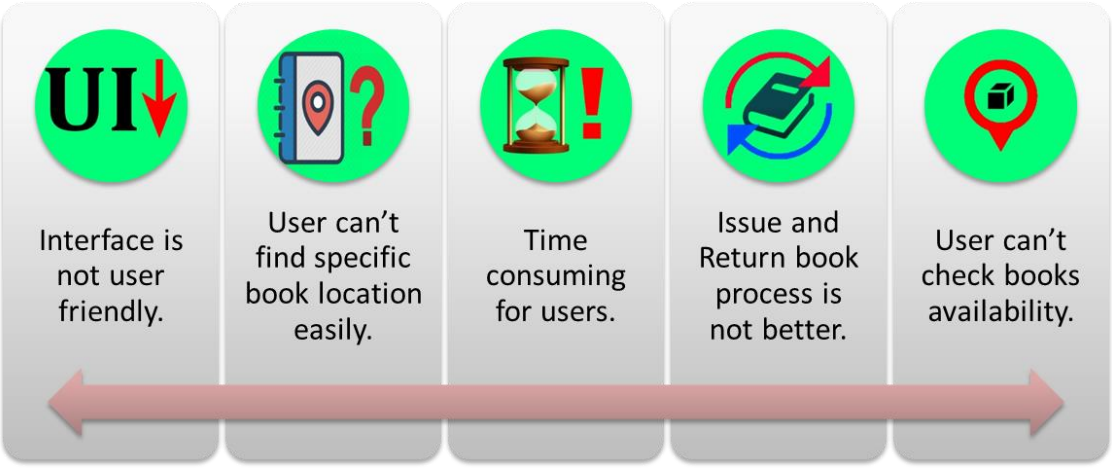


Fig 1.4.1- Drawbacks of existing system

1.5 Proposed System

Proposed system aims at developing a Server based mobile application which can make the library system better than previous for the users. As this is a server based application, the users will remain updated about his/her activities of library such as graphical book location, borrowed/returned book status and penalty/fine status etc. The library operator just needs to maintain the data server.

Fig 1.5.1- Server Based Android App

1.6 Problem Statement

Nowadays, people are using Smart phones so much than a Computer. So it is time consuming for those who are using web based library managemant system. The users needs to start the computer and use the web based library managemant system. Yes, users can run this web based library managemant system in mobile browser but the interface is not seemed suitable as like in a computer. As Smart phones are always near to hand of users, they can easily get all the library facilities in a single app. The main purpose of the app is to facilitate interactions between library and the users of the app.

1.7 Scope and Limitations of the Study

A. System Features and Functionality

This Web-based Library Management System is composed two major modules such as the **Admin Librarian Module** and **Student/User Module**.

A.1. Admin Librarian Module

Account Information – allows admin librarian to edit personal information such as name, gender, username and password, etc.

Book Information – allows admin librarian to edit book information such as book id, name, author name, edition, book location, etc.

View Borrowed Book and Returned Book – allows the admin librarian to monitor borrowed books that due every day and which are returned everyday. It will also allow the admin librarian to return and renew borrowed books.

View Requested/Reserved Book – allows the admin librarian to monitor requested/reserved books that due every day.

Open/close student/user reservation – enables the admin librarian to close or open the book reservation in the student/user module.

View Statistics (yearly generated books) – allows the admin librarian to view the statistics of borrowed book every month per institution year.

Notice Board – allows the admin to provide important notices.

Log-out – allows the admin librarian to sign-out of the admin librarian module.

A.2 Student/User Module

***Search book by title, author, category* –** enables the students to search for the book by its title, author, catagory, etc.

***Book Preview* –** enables the students to see book previews.

***Book Availability* –** enables the students to check book preview.

***Book Location* –** enables the students to see the book location map.

***Reserve/Request Book* –** enables the students to make a book reservation/request. Students can only perform this process only if he or she is logged-in in the app.

***View reserved/requested book* –** enables the students to view all the books that was being reserved.

View borrowed book – enables the students to view all the borrowed books.

***View Penalty Status* –** enables the students to view penalty status.

***View Notice Board* –** enables the students to view notices.

***Changing Password* –** enables the students to change password.

***Log-out* –** enables the students to sign-out of the student/user module.

B. Limitations

Due to the limited time given in the development of this project, some features are excluded in this system. Limitation of the system will be discussed below.

A.1 Admin Librarians Module

1. Calendar displayed in this module is not interactive and it is just for viewing purpose only.

2. Statistics graph is for display only, this can't be downloaded.

A.2 Student Module

1. Book reservation is only for the students/users. Instructors, faculties and staffs of the school has no access to make book reservation, they can only search for books in this module.

2. Book contents are not visible in this module; only the details of the books are available and can be viewed inside such as the author, title, subject, category, publisher and edition of the book.

1.8 Motivation

From the view of current system of library management system, there is no efficient software or solution which can easily manage all the library activities at a platform.This free Android application will make the library sysyem better hopefully.You will have all the major functions of library in this app. This app will save the time of librarian as well as the students/users.

Chapter 2

FEASIBILITY STUDY

2.1 Feasibility Study

A fesibility study is conducted to select the best system that meets performence requirement. This entails an identification description, an evaluation of candiadate system and the selection of best system for the jon. the system required performence is defined by a statement of constraints, the identidication of specific sysyem objectibe and a description.

The key consideration is feasibility analysis are :

1. Economic Feasibility

2. Technical Feasibility

3. Operational Feasibility

2.2 Econimic Feasibility

It look at the finantial aspect of the peoject. It determines whether the management has enough resources and budget to invest in the proposed system ans the esmited time for the recovery of cost incurred. It also detemines whether it is worthwhile to invest the money in the proposed project. Economic fesibility determines by the means of cost benifit analysis. The proposed system is economically feasible beacuse the cost minimises in hardware purchasing. The operating environment costs are marginal. the less time involved also helped in its economic feasibility. The Business Case provides an analysis of the business environment including, but not limited to, a description of who the expected customers are, the nature of the business, how the payment is currently being processed, if applicable, and the current and expected volume and timing of transactions. The Business Case also presents the benefits of the proposed project.

2.3 Technical Feasibility

Technical feasibility takes of the all issues concerned with the design and development part of the project. It concerns itself with the software, hardware and the platform related issues. The following are technical specifications for our project.

The project would require a lot of space storage of static as well as dynamic content.

2.4 Operational Feasibility

Operational feasibility is the measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.

The system will be used if it is developed well then be resistance for users that undetermined :

- No major training and new skills are required as it is based on Waterfall Model
- It will help in the time saving and fast processing and dispersal of user request and application.
- New product will provide all the benifits of present system with better performence.
- Seller will control over their own shop
- Faster systematic processiong of iser application appoval. used had greater chances of error due to wrong information.
- Easy UI for controling.

2.5 Software Requirements

A software requirements specification (SRS) is a description of a software system to be developed. It lays out functional and non-functional requirements, and may include a set of use cases that describe user interactions that the software must provide.

- ❑ Android Studio IDE (Integrated Development Environment).
- ❑ Android SDK (Software Development Kit).
- ❑ Android Emulator.
- ❑ JDK(Java Development Kit).
- ❑ JAVA Progamming Language.

- XML for Software Design.
- MySQL for Database.
- phpMyAdmin for server.
- HTML and CSS for webpage design.

2.6 Programming Language

JAVA , ANDROID, SQL these programming languages are used to develop this project.

CHAPTER 3

SYSTEM ANALYSIS

3.1 Requirement Analysis

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications.

Hardware Requirements	Software Requirements
❖ Memory of 4 GB RAM or more ❖ Monitor resolution of 1024 x 768 or higher ❖ Intel Pentium 4 or 3 GHz (or faster) ❖ 200GB (or more) available hard disk space	❖ Android Studio IDE v2.2.2 or more ❖ Android SDK tools v22.0 or more ❖ Android API-19 (4.4 Kitkat) or more ❖ Java SE JDK v8.0+ ❖ Operating system- Windows 7,8 or 10 and Linux Ubuntu 16.04 ❖ Android Virtual Device (AVD)

3.2 Feasibility Study

A feasibility study is an analysis of how successfully a project can be completed, accounting for factors that affect it such as economic, technological, legal and scheduling factors. Here we use feasibility studies to determine potential positive and negative outcomes of a project before investing a considerable amount of time and money into it.

Due to it fullfill the requiremets of

1. Economic Feasibility

2. Technical Feasibility

3. Operational Feasibility

So the Software is feasible for all the users.

3.3 Technical Feasibility

Technical feasibility is one of the first studies that must be conducted after a project has been identified. In large engineering projects consulting agencies that have large staffs of engineers and technicians conduct technical studies dealing with the projects.

This project is strongly technically feasible. Because it needs less hardware & technical eruipemets.

3.4 Process Model Used

The ultimate objectives if software engineering is to produce good quality maintainable software within reasonable time frame and at affordable cost. This is achieveable only if we have matured processes to produce it. For a mature process, it should be possble to determine im advance how much time, cost and effort will be required to produce the final product. This can only be done using data from past experience, which requires that we must measure the software process,

A key component of any software development process is the life cycle model on which the process is based. Life cycle of the software starts from concept exploration and ends at the retirement of the software.

The system life cycle is the period of time that starts when a software product is conceived and ends when the products is no longer available for use. The software life cycle typically includes a requirement phase, design phase, implementation phase, test phase, installation and check out phase, operation and maintainance phase, and sometimes retirement phase.

This system is developed mainly following Agile Software Development Methodology.

3.5 Agile Software Development

Agile software development describes a set of values and principles for software development under which requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams.

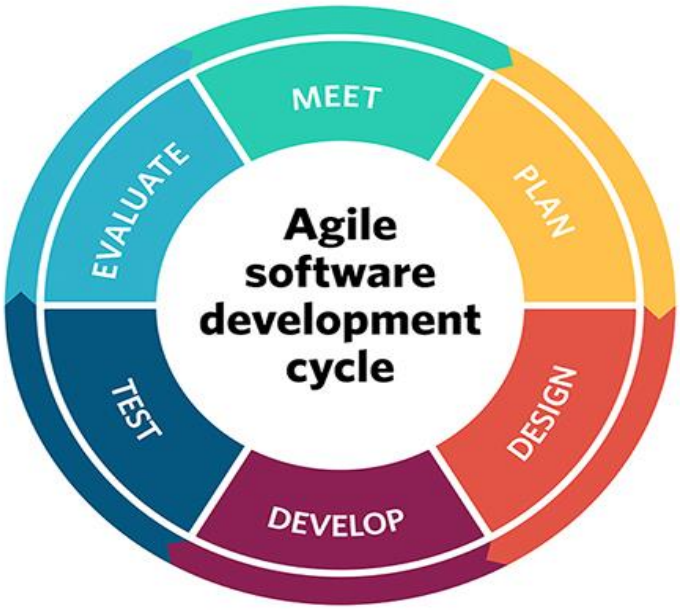


Fig 3.5.1 - Agile Software Development Cycle

Main features of an Agile software development life cycle model

1. Individuals and interactions

In the Agile software development life cycle model, self-organisation and motivation takes precedence over delegation of authority and following the "seniority" hierarchy. Team members are encouraged to take an active part in the development and planning activities. They are also "empowered" to take certain decisions on their own. The Agile team has to collaborate and share ideas to develop the product "as a whole" unit i.e. each member should support a common vision

2. Working software

Agile concentrates upon delivering sustained "working" product releases through product incremental cycles over documentation and working protocols. The main objective is to develop, and deliver, bug free product feature releases in a continuous and sustained manner until the entire product is developed.

3. Customer/user collaboration

Since all the requirements pertaining to product development may not be available, or "acquirable", at the project start up time owing to various factors, development should commence almost "immediately", and presented to clients for verification purposes. Stakeholders and project owners "clear" the product features developed through the sprint cycles. A lot of time is saved through customer collaboration, and as a result, the project proceeds in a successful manner as the client always Okays the development keeping in mind the current market trends.

4. Responding to changes

Agile focuses upon incorporating dynamic changes in the product development cycle. Changes in the product features can be easily and effortlessly carried out by developing "user stories" – product functionality or features as defined in the product backlog. Changes can be carried out at any time while the features are being developed – even late in the product development cycle.

3.6 Advantages of Agile model:

- Customer satisfaction by rapid, continuous delivery of useful software.
- People and interactions are emphasized rather than process and tools. Customers, developers and testers constantly interact with each other.
- Working software is delivered frequently (weeks rather than months).
- Face-to-face conversation is the best form of communication.
- Close, daily cooperation between business people and developers.
- Continuous attention to technical excellence and good design.
- Regular adaptation to changing circumstances.
- Even late changes in requirements are welcomed

3.7 Disadvantages of Agile model:

- In case of some software deliverables, especially the large ones, it is difficult to assess the effort required at the beginning of the software development life cycle.
- There is lack of emphasis on necessary designing and documentation.
- The project can easily get taken off track if the customer representative is not clear what final outcome that they want.
- Only senior programmers are capable of taking the kind of decisions required during the development process. Hence it has no place for newbie programmers, unless combined with experienced resources.

3.8 Resons for Use

- The customer has frequent and early opportunities to see the work being delivered, and to make decisions and changes throughout the development project.

- The customer gains a strong sense of ownership by working extensively and directly with the project team throughout the project.

- If time to market for a specific application is a greater concern than releasing a full feature set at initial launch, Agile can more quickly produce a basic version of working software which can be built upon in successive iterations.

- Development is often more user-focused, likely a result of more and frequent direction from the customer.

3.9 Technolody Used

This pojects requires the following software tools in order to function property.

JAVA :

Java is a programming language. It was first developed by James Gosling at Sun Microsystems, which is now a part of Oracle Corporation. It was released in 1995 as a part of Sun Microsystems' Java platform. The language has developed much of its syntax from C and C++. Java applications are usually compiled to bytecode (class file) that can run on any Java Virtual Machine (JVM). Java is currently one of the most popular programming languages being used. It has about 10 million users.

- Java requires that each variable be initialized. Some older languages such as C, allow variables to go uninitialized, which can cause random failures with mysterious bugs.
- Java requires that each method that declares a return type, always return a value. This also prevents bugs.
- Java comes with a large set of classes and methods, the Java API that can be used without having to develop as much code "from scratch".
- Unlike C, Java primitive types, such as int, are always the same size in the number of bits which helps achieve cross-platform compatibility.
- Java has exception-handling that requires a programmer to handle error-conditions such an Input/Output errors.
- Code compiles on one Java platform can be run on other platforms that support Java without modification of either the source-code nor the byte-code. For example, this means that a person can make a Java program for a Windows computer and have it run a Linux computer or a Mac computer.

Android :

Android is a mobile operating system developed by Google, based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed Android TV for televisions, Android Auto

for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics. Initially developed by Android Inc., which Google bought in 2005, Android was unveiled in 2007, along with the founding of the Open Handset Alliance – a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices. Beginning with the first commercial Android device in September 2008, the operating system has gone through multiple major releases, with the current version being 7.0 "Nougat", released in August 2016. Android applications ("apps") can be downloaded from the Google Play store, which features over 2.7 million apps as of February 2017. Android has been the best-selling OS on tablets since 2013, and runs on the vast majority[a] of smartphones. As of May 2017, Android has two billion monthly active users, and it has the largest installed base of any operating system.

phpMyAdmin Server-

Here, phpMyAdmin is used for data server. All the databases are stored in the data server.

HTML & CSS-

HTML and CSS is used for webpage design.

SQL -

SQL (pronounced "ess-que-el") stands for Structured Query Language. SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database. Some common relational database management systems that use SQL are: Oracle, Sybase, Microsoft SQL Server, Access, Ingres, etc. Although most database systems use SQL, most of them also have their own additional proprietary extensions that are usually only used on their system. However, the standard SQL commands such as "Select", "Insert", "Update", "Delete", "Create", and "Drop" can be used to accomplish almost everything that one needs to do with a database. This tutorial will provide you with the instruction on the basics of each of these commands as well as allow you to put them to practice using the SQL Interpreter.

3.10 Tool Used

Android Studio -

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development.
Android Studio was announced on May 16, 2013 at the Google I/O conference. It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014.[10] The first stable build was released in December 2014, starting from version 1.0.[11] The current stable version is 3.0 released in October 2017.

XAMPP -

XAMPP is a free and open source cross-platform web server solution stack package developed by Apache Friends consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. Everything needed to set up a web server – server application (Apache), database (MariaDB), and scripting language (PHP) – is included in an extractable file. XAMPP is also cross-platform, which means it works equally well on Linux, Mac and Windows. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server extremely easy as well.

CHAPTER 4

DESIGN

4.1 Intoduction

This chapter contains the designing part of the application. It describes all the the design architectures of this app. For Example: the flow chart, the use case diagram, the E-R diagram, the database designs as the table diagrams.

4.2 Flow Chart

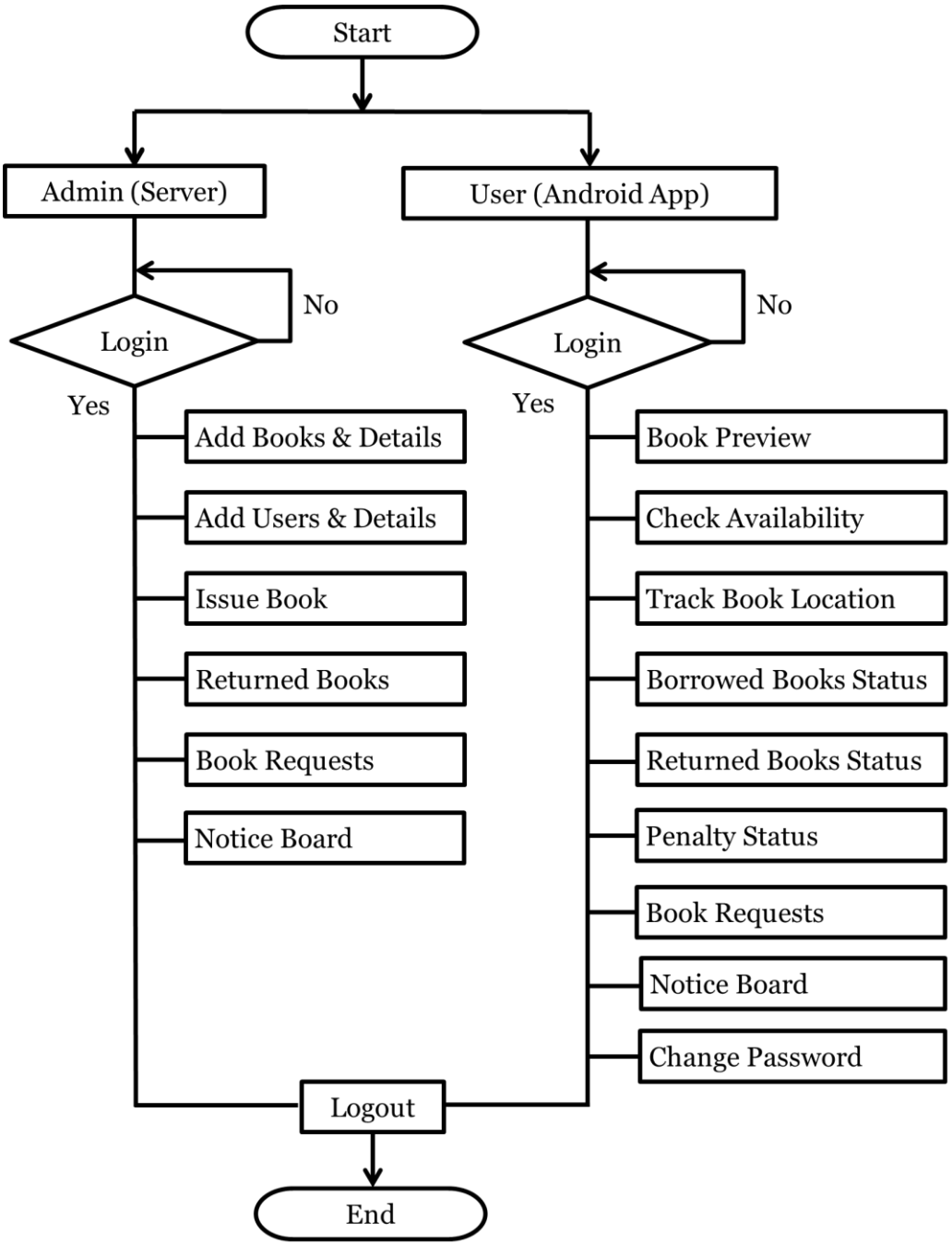


Fig 4.2.1 - Flow Chart

4.3 Use Case Diagram

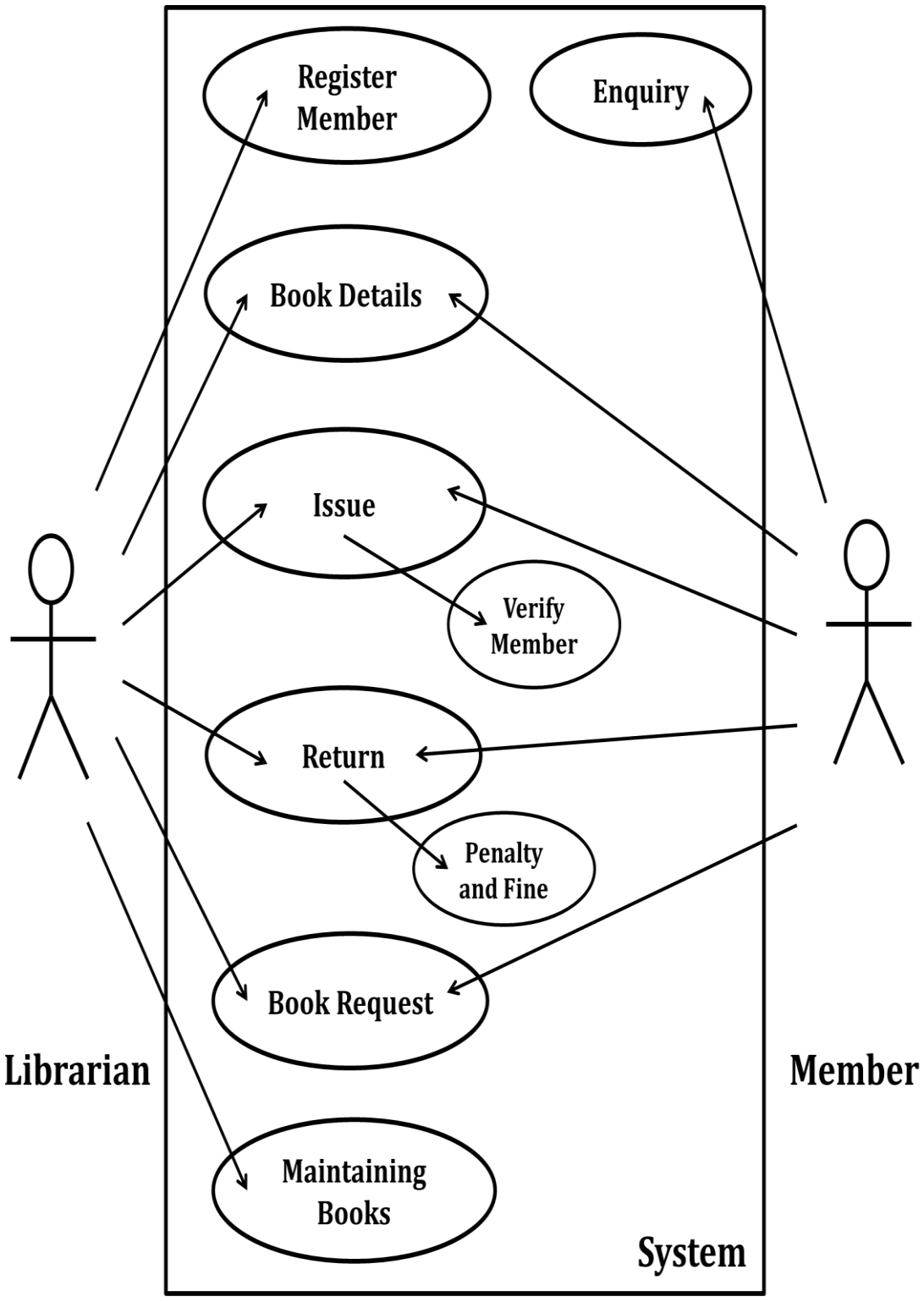
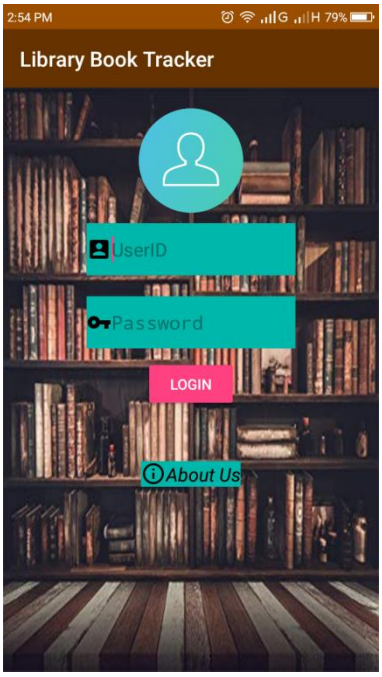
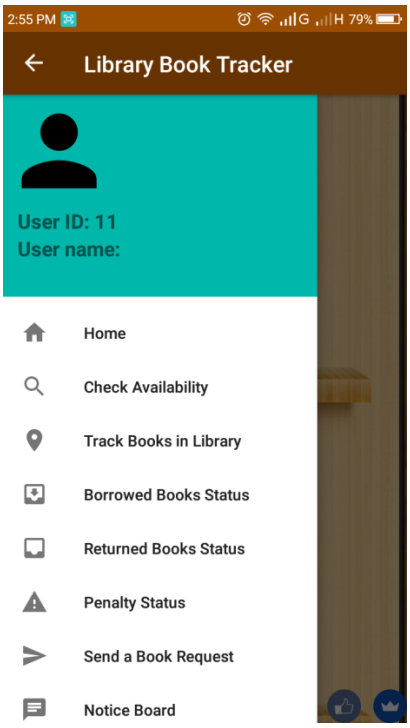


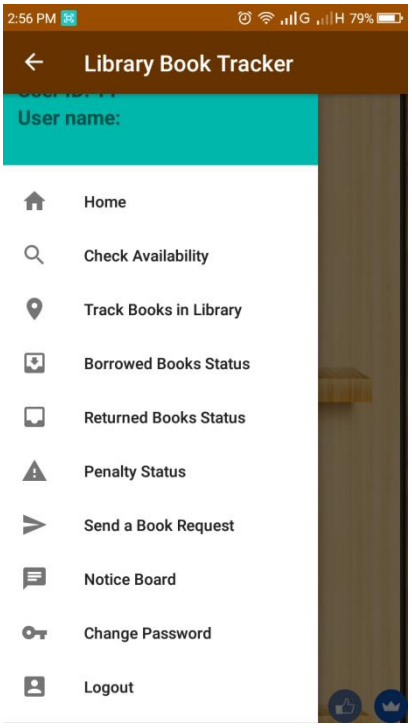
Fig 4.3.1 - Use Case Diagram

4.3. User App Login Interfac



4.4. Logged in Interface





4.4. Book Preview Interface

4.5. E-R Diagram

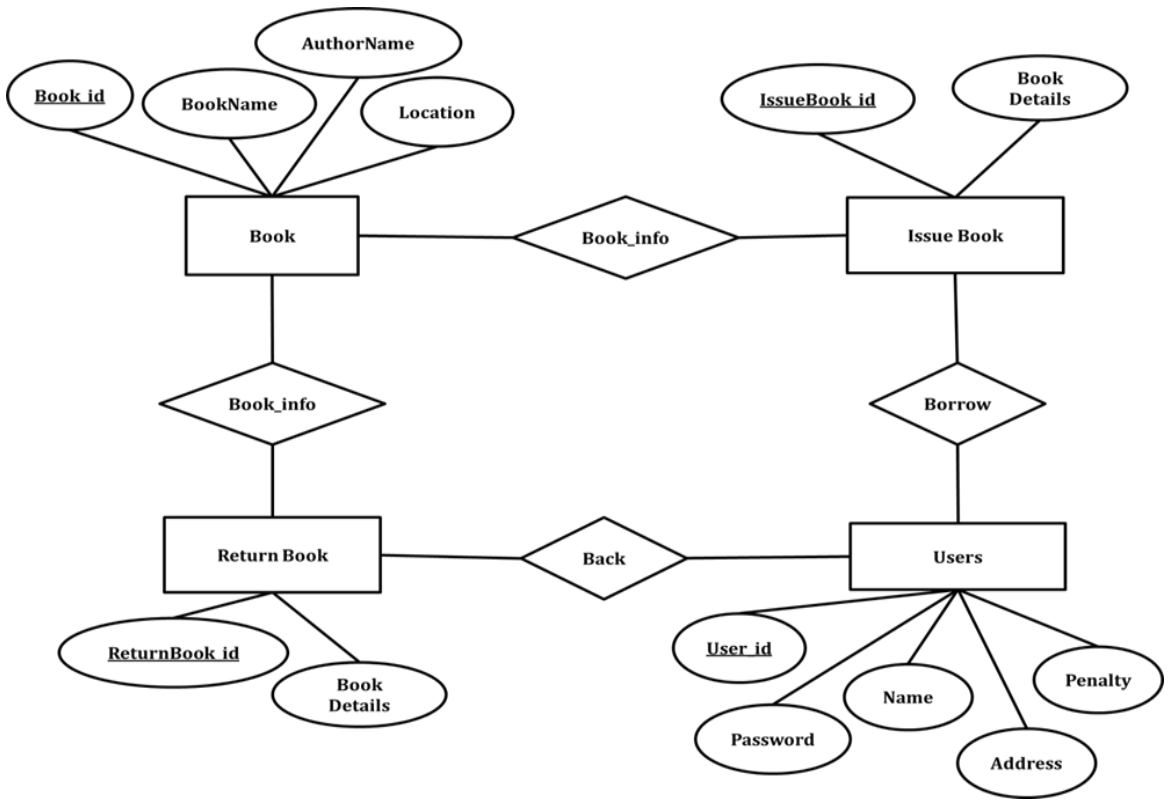


Fig 4.5.1 - E-R Diagram

4.6. Database Design

Book Database-

Book Id	**Book Name**	**Book Writer**	**Book Edition**	**Book Quantity**	**Book Location**

User/Student Database-

User ID	**Password**	**Name**	**Mobile Number**	**Address**	**Penalty**

Issued Book Database-

Issue Id	**Book Id**	**User Id**	**Issue Date**	**Return Date**

Retuned Book Database-

Return Id	**Book Id**	**User Id**	**Return Date**	**When Returned**

Requested Book Database-

Request Id	**Book Id**	**User Id**	**Request Date**

Notice Board Database-

Notice Id	**Notice**