

## Library Management System Using Android

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**Abstract**— Today's education institutes understand the importance of the library with the increase in education standards. Library management system is online system. This system helps in maintaining all daily tasks of library. As the numbers of users are increasing there is a demand for effective library management system that reduces cost of management and saves time of users. This project has facility of student login and a facility of teacher login which are generally not available in manual library management systems. It also has a feature of librarian login through which the librarian can handle the entire system. It also has a facility through which student can view list of issued book to them and its issued date and return date after logging in their accounts. Through feedback students can appeal librarian to add new books and can also give suggestions. This system also authenticates users through email verification.

**Keywords**— Library management system, Android Operating System, Firebase, java.

### I. INTRODUCTION

Library management system is a software developed to monitor and control the transactions in a library. Manual library system should be replaced by online library management system. With manual systems staff spends a lot of their time on manual tasks. The biggest downfall to manual document filing is the amount of space it can take. So to reduce human efforts and cost and to increase efficiency and also to save time there is need to develop online library management system. Library management system will be user-friendly and will provide mobile access to search library catalog, books and resources from anywhere via smart phones. Our project library management system is developed in java which mainly focuses on basic operations in library. We are using Firebase database which is real-time database where data is synced across all clients in real-time, and remains available when your app goes offline. This application is useful for students and staff and mainly for librarian who can manage records digitally.

Rest of the paper is organized as follows, Section I contains the introduction of Library management system, Section II contain the existing system, Section III contain the problem statement, Section IV explain the methodology with block diagram and flowchart, section V describes results and discussion and Section VII concludes research work with future scope.

### II. EXISTING SYSTEM

As we know that manual library management system is very time consuming. Manual systems are also prone to damage and being misplaced. Librarians find it difficult to

offer a wider range of new services with a manual library system. For example, a library can put its catalog on the app allowing readers to access it remotely; with a manual system members have to visit or telephone the library to find this information. Manual system takes lot of space to store record as librarian manually keeps record of all the transactions in library. Working with paper documents it is difficult to make changes in data as we have to erase previous data and becomes difficult to edit data manually. Security point of view manual library management system is less secure. Increasing users increases the files in library making more use of papers for data filling thereby increasing cost. Some system has been developed to computerized library system but database is SQLite database which stores the library data. SQLite is local database on Android device with SQL interface.

### III. PROBLEM STATEMENT

There is need to have digitized library management system. The manual library management system takes lot of time of students, staff as well as librarian as students or staff has to visit library to know catalog of library also librarian has to keep record of data manually by doing lots of paper work. This problem needs to be fixed as manual systems are prone to human errors. Existing system faces the problem such as the fast report generation is not possible also information about issue return of the books is not properly maintained and tracing book also becomes difficult. The existing system should be replace by computerized library management system to increase efficiency in which librarian can put its catalog on the app allowing users to access it remotely. From environmental point of view lots of paper work is reduce as data is available online thereby reducing load of librarian.

**IV. METHODOLOGY**

Block diagram represents basic design of our library management system.

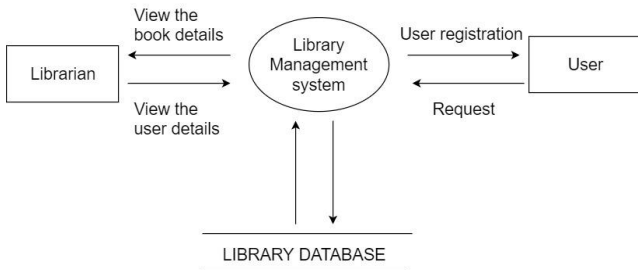


Figure 1. Block diagram

Figure shown below is flowchart of our system which shows flow of our library management system.

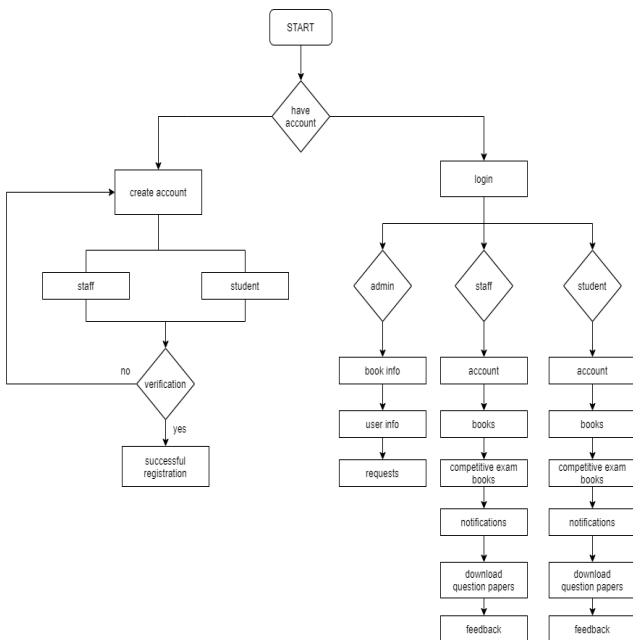


Figure 2. Flowchart

Our application is developed using Android Studio. Android is an open source mobile operating system. Android programs are written in java and xml and run through a JVM that is optimized for mobile devices. Here java is used for backend and xml for used in frontend.

We have used firebase database which is no SQL database that stores data in the cloud that users can access it directly in real-time. Firebase database is real time database. It allows users to access data from anywhere. When user create account, he/she can login using email as username and password. Authenticate users through email verification.

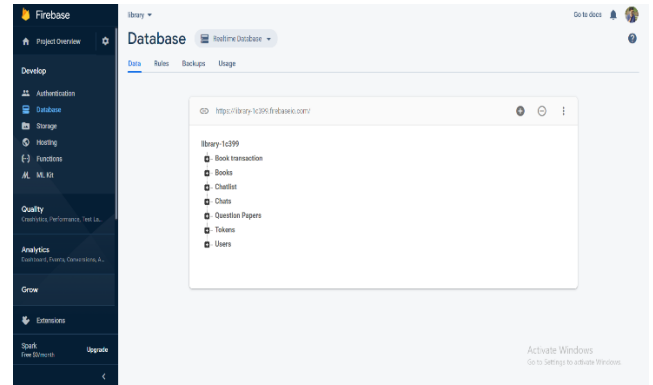


Figure 3. Database

**V. RESULTS AND DISCUSSION**

*A. Users*

There are three users:

- Admin
- Student
- Staff

Librarian acts as admin. Admin can fully access the system.

Most of the rights are reserved with admin. Admin can manage books, manage students, manage staff, add question papers and issue books. Admin can view user account as well as all books and can add books by filling the form in which there are number of headings to be filled such as ‘Name of Book’, ‘Book Title’, ‘Author Name’, ‘Published Year’, ‘Edition’, ‘Book Category’, etc. Librarian can digitally maintain all records.

Students have to open account and set username and password which he/she can use to login. Students can issue books also he/she can issue competitive exam books and download question papers from app. This application helps students to see whether books are available from anywhere. Students can view available books as well as issued books.

Staff can also issue book from library. Staff has to sign in and create account. Staff can also download papers.

*B. Books*

Books are managed by librarian. Users can issue book including Librarian. Number of books users can issue differ according to user type. Staff can issue 10 books and students can issue 5 books. Librarian being the admin can issue 10 books. Librarian can view all data related books. Librarian also has list of issued books. The day when the user issues book from library that day is considered as issued date and returned date is calculated. Books can be searched by title, subject, author, content. Recent issued books are visible to users. Availability status of books can also viewed.

*C. Competitive exam books*

Competitive exam books is different section of books where students can issue competitive exam books. The

issued and returned date is calculated same as other books in library but the duration of returning these books is more. Librarian can view all data related to these book.

#### D. Question papers

Librarian can upload question papers which are displayed to users and users can download from their account. On one click users can download any previous question papers from anywhere.

#### E. Feedback system

If any user has any doubt or suggestion and wants to communicate to librarian he/she can directly message to librarian and communicate. If librarian wants to convey something to users then he/she can message them through chat system provided in the app. Librarian can view all the users so he/she can talk to any users but users can only view librarian.

#### F. Library Top view

App has top view of library so users can get idea of structure of library so that users can easily find the books.

### VI. CONCLUSION AND FUTURE SCOPE

The paper conclude that the proposed Library Management System will be computerized management system developed to maintain all library oriented tasks. The system is highly efficient GUI based software so it is easy to use. Software will meet all the requirements of library and capable to provide easy and effective storage of information. The main goal of the project is to reduce overall manual work thereby reducing time and paper work in library. Drawback of system is that librarian has to enter every detail of new book add in library. This problem can be solved by providing facility that will automatically add book detail in library database on one click.

This system can be implemented in college libraries and even public library. In future we will try to use machine learning in our system so that user will get suggestions according to their interest. Barcode system can also implemented for adding books. The system can be further extended by adding facility of E-Books.

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