

An Advanced Library Management System Using Android Device

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Abstract— Android platform is gaining popularity and holds more users than other platforms. Earlier Librarian needed to keep track of books in a vast room. But evolution of the computers, smart phones and internet have made the work much easier. LIBKART application helps the users to access their required information and queries without the help of computers or the librarians but through their android devices which saves their time and energy. In this paper we provide an efficient access over library system using a Smartphone application named as LIBKART. The main purpose of this paper is to provide an easy access to library and to provide details of library books, issue of books and notify the user due dates of book being issued. The paper also aims at providing a reference section of books where the books can be downloaded through permission from admin. The user can access the newspapers on daily basis and can also download university question papers.

Keywords—Android, library system, smartphone, LIBKART

I. INTRODUCTION

A library is a formatted collection of sources of information which is made accessible to the people of different community. The information in a library can be in a physical format or it can also be digitized. In olden days the access to library was usually in the Library room [1]. Students waited in line for their turn to issue the books. The advancement in technology has made the access online [2]. This provides an efficient use of technology by eliminating the rigorous paper work to be done. Initially the computers eliminated the paper work to be done, then came the internet which provided a feature for storing data centrally and then accessing it. Since data storage is centralized one can access it online. Presently the transitional phase in mobile services is from SMS (Short Message Service) to WAP (Wireless Application Protocol) services. This does not provide a good experience for user.

The mobile phones provided the mobility of devices. The initial mobility platforms were Bada, Flash UI, and Symbian etc. Later for easy user interface, better response time and faster access Android operating system was introduced. Android is an open source platform based on the Linux Kernel introduced by Google. In the present era, android has become a popular platform. Android operating system is mainly designed for smart phone and tablet devices. This application

can be downloaded through Google play store feature. These applications can run on Android Smartphone, TV, Tablets and other devices and are available in Google play store, Amazon app store and various other android app focused sites [7][8]. Android Virtual Device (AVD) is used to test the android application without the need for mobile or tablet etc. Android applications use .apk as the extension [11].

The database technology plays an important role in query processing than paper work. The tremendous improvement in internet has provided opportunities to interact with new products online. LIBKART application is mainly built for android devices which work on Linux platform. This paper depicts how a user such as student or faculty can view the books to be issued, get the due dates of the books to be returned. Since the whole process is online based it saves lot of user's time. The user can have access to daily newspapers in English, Hindi and Kannada. User has a liberty to download the university question papers through this application. LIBKART application developed is designed for Nougat and also works in all other lower version. The application keeps track of all the books in the library, their author, publication, cost, book id and total number of books available. In order to have access to LIBKART features the user must first register and then login.

II. EXISTING SYSTEM

'Online Library Management System' focuses on day to day operations in library such as the user searching for desired book, issue and then return the book [3]. This was developed for 32-bit windows operating systems. The disadvantage is managing the library manually by a librarian.

Development of RFID based library management system proposed an automated identification technique called RFID (Radio Frequency Identification) [4]. This system is based on the high frequency DLP RFID1 Read/Write having the frequency range up to 13.5Hz. The database for this system is maintained by MySQL using MATLAB. It is used to maintain database of books information. Since lot of hardware is involved, it has high initialization cost and is difficult to handle.

'Design and implementation of the mobile library app based on smart phone' [5] describes development of a mobile

library application for smart phones. To provide improved book recommendations and novel reading services users personal preferences were taken into consideration. This lacks in innovation and user interface can be made more interactive.

Library Access System Application [6], was developed for Android using SQLite Database. This application provides access to library account to check the availability of books. The drawback is that it does not provide efficient data processing.

III. PROPOSED SYSTEM

A. System architecture

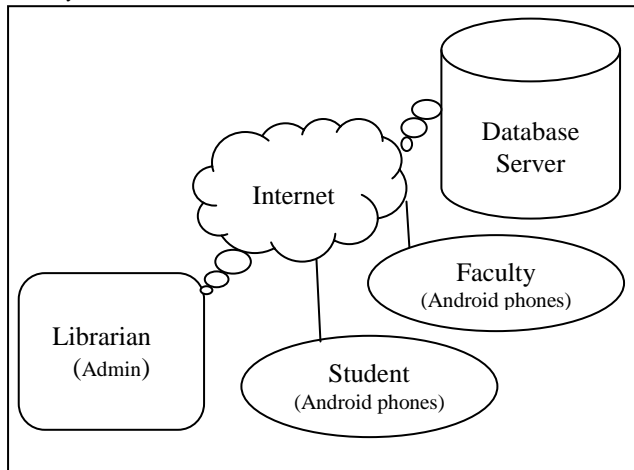


Fig. 1. Basic structure

The basic structure of LIBKART in Fig. 1 consist of librarian, student/faculty. The librarian has a direct connection to database. LIBKART application is installed in student/faculty's android phones through which the interaction with the database can be done. This reduces the time involved in going to library ,searching book in book shelf and then waiting in queue for his/her turn to issue the book.

B. Android Application

This application is designed for devices powered by Google's android platform. The main programming language used here is java. The development tools such as debugger, emulator, documentation and sample codes are present in Android Software Development Kit (SDK) [8]. It consumes less memory and provides fast performance. Developers can download the Android software development kit (SDK) from the Android website [9]. The SDK includes tools, sample code and relevant documents for creating Android apps [10].

B. Database

All the required information about faculty, student and books are stored in library database. Initially the student/faculty can register them and then they can use the

login ID and password to login the android application. Student/faculty database contains information regarding name, USN, branch, year, mobile number and password. Book database contains information regarding book accn (accession) number, author, title, publisher, edition and cost. LIBKART application retrieves the information stored in library database through SQL queries. Database checks for user credentials to meet authentication. We have used 000WebHost an online database for our application.

C. Librarian

It is librarian's job to maintain the database up to date. The librarian needs to notify the users about any news regarding to LIBKART and library policies. Librarian needs to maintain detailed information about the books, journals, magazines etc.

D. Student/Faculty

With the help of registered login ID and password the student/faculty can login through LIBKART application. Student can issue a maximum of 3 books and faculty is provided with maximum of 6 books. Student/faculty can request for issuing a particular book. If the request is accepted within 24 hours student/faculty must collect the book, otherwise the request will be cancelled after 24 hours and they again need to issue the book. The issued book must be returned within a time period of 15 days, otherwise they may have to pay a penalty amount

IV. WORKING MODULES

A. Login through Android

If a new user wishes to login he initially needs to register himself and then he can login using login ID and password provided. If all credentials are properly satisfied then the user is logged in. The login is classified into two types, student login and faculty login as shown in Fig. 2.



Fig. 2. Login page

B. Signup

When the user registers to the LIBKART application he/she needs to enter all the fields given below in Fig.3. Once the user enters all the required fields properly he/she can press the register button which will store user's information in the database.



Fig.3. Register page

C. User module

The user is directed to user module where he/she could view various options as shown in Fig. 4. such as issue, notices, newspaper and question paper.

Issue is particularly used to issue the desired book from available books as shown in Fig. 5. The user can search the desired book and long press the book name to issue it. The librarian has the authority to accept or reject the request. Notices display the important news regarding the library management from librarian.

Newspaper in Fig. 6 provides online newspapers available in English and Kannada languages. The user can read the newspaper by clicking on any of the options provided such as Udayavani, VijyaKarnataka, The Hindu and Times of India.

Question paper shows university question papers according to year and branch shown in Fig. 7. The user can download the desired university question paper.

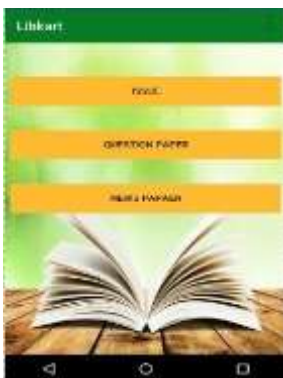


Fig.4. Options

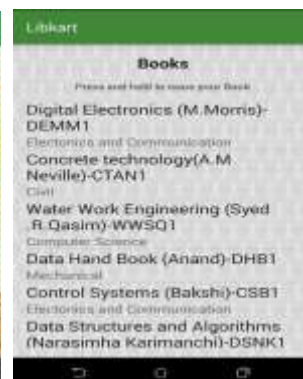


Fig.5. Issue



Fig.6. Newspapers



Fig.7. Question paper

V. ADVANTAGE

1. This application provides an easy interface to access library account.
2. It also allows the user to access library account through android smart phones.
3. It can be used in all the existing versions of android devices.

VI. CONCLUSION

In this paper we have developed LIBKART application built for android devices. This aims at providing easy access to library using your smart phones. A lot of user's time is saved since the application is online and user does not need to stand in queue for his/her turn to issue the book. However the detail about the books must be manually updated by the librarian and can be used only by android devices. In future the librarian can use bar code scanner to update the book details and the notices updated by the librarian can be viewed by the student through android application.

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