An Android Application for Library Access System

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Abstract

The process of library access system is still manual in most of the schools and colleges. The problem of manual process is inconvenient and time consuming. This paper proposes a Library Access System which is designed and implemented for android users. Nowadays Android Mobile platform is a widely used platform in smart phones. This paper focuses on the development of mobile application for Library Access System. Using this system, patrons can access the library information without the librarian or computers. This application receives the relevant information stored in the database. This system can be accessed by only authenticated users. Using this system, administrator can enter the new book details, update borrow/return details and user can search books, view due dates. This work brings an idea of the public to access the library.

Keywords
Library management, Android application, Library Access System

Introduction

Library Access System automates the functions of Library Access. In earlier days, all library access operations were manual and time consuming. Then standalone applications were introduced using C, Visual Basic with oracle backend to automate the library operations. The drawback of those applications is, the librarian only can access the system. When the users want to borrow books, search books and return books they will meet the librarian who will update /search the database using the standalone application. After that web applications for Library Access system using JSP, ASP, JavaServlets with backend such as Oracle, SQLServer, MySQL etc., were developed. Using web application system, one can search books in the library from anywhere using computer with internet connection. Nowadays mobility has become everything. This paper proposes a mobile application for Library Access System which is implemented for android phones. The proposed Library Access system allows users to manage the library by its quick and interactive interface. Using this application, any user can access the due dates and search books in the library and the library administrator can manage all the library item details and keep track on all the books details.

II. RELATED WORK

Number of authors proposes their work for library management. But this system let the user to complete their task easier. Some of the related work is also available for accessing and managing the library. But this work made our task easier.

A library access system- smartphone application using android[9] was proposed by R.Dinesh et al,. They developed a mobile application which provides appropriate functions for library access.

A Java Application for Online Library management System[2] was developed by Ashutosh Tripathi & Ashish Srivastava . This library management system provides necessary interface for both user and administrator for accessing library system.

Development of RFID Based Library Management System[1] Using MATLAB was proposed by C. Srujanaet al., this system is implemented using MATLAB and MySQL, based on the emerging technology called Radio Frequency Identification. This system is based on high frequency DLP RFID1 Read/Writer.

Design and implementation of LMS based on web service [5] was proposed by Yujun Li et al. This web based application which provides necessary functions of library was implemented using JSP using SQL server 2005. This system uses stored procedures and triggers to optimize the performance of the database.

Problem Description
The following problems are identified in library management without any automation. 1. Stock maintenance and management, security, searching for mis-placed books etc.

This system is more efficient in tracking and managing library materials. The objective of this system is to overcome the problems such as searching mis-placed books and Stock maintenance. This system also reduces the manual work and reduces the time wasted for searching the book manually.

Proposed System

Proposed system is an Android Application for Library Access. Using this System, user can add members and search books in quick time. Administrator can add books, search members, search books, borrow and return books in quick time.

Android OS and SQLite Database

Android is a mobile operating system was developed by google, based on linux kernel, mainly introduced to fulfill the market requirements. It was designed especially for touch screen devices such as smart phones and tablets. SQLite is an embedded SQL database which stores all data. Information is actually stored at the client end for quick access. It is the widely used database for the mobile applications. Databases cannot be accessed from outside the application.

There are lot of sophisticated Technologies are currently available to built android applications, the most frequently used tools are Android Studio, Eclipse IDE. Eclipse, an integrated development environment (IDE), is a powerful tool for developing mobile applications. Java N-IDE is used to develop Library Accessing System.

Android Software Development Kit (SDK) consists of a set of development tools. The development tools include Libraries, Debugger, sample codes. Programmer uses Eclipse and NetBeans to develop android application. The android applications are packaged file system with an extension .apk[6]. This extension file holds the .dex[7,8]and resource files etc. The combination of Eclipse and android SDK tools is said to be an IDE(integrated Development Environment) which is used to develop android applications.

The proposed system is developed using Java N-IDE and provides necessary interface through which users can view the available books in the library and their due dates and administrator update borrow/return details, enter book details and search books.

This system provides the individual interface for users and administrator to access to LAS

Library Access system will be loaded in the Google play store so that anyone can downloads LAS from it. The updated version details are notified to the users of Library Access System(LAS).

We use Java N-IDE to create this application under a package.com.example.MyAppplication. The first step is to modify the Main/Activity file by adding required code. Then the activity _main.xml file is modified by adding necessary XML components. The application is run and installed in the android device by clicking the run button. The project window is displayed in figure 1.

The LAS provides three interfaces of the following components

a) Login/Registration module b)Administrative module c) User module

Login module asks your credentials to login to some particular application. You might have seen the same when logging into our mail, WhatsApp etc., sample source code is given in figure 2.
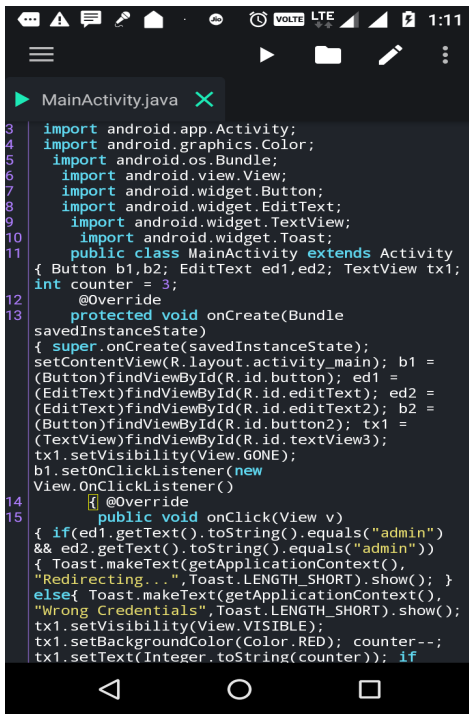

Fig 1: Project Window in Java N-IDE.

Fig.2. Sample Source code in Java N-IDE

Interface of Login/Registration

Using registration module, a new users can register themselves by giving the necessary details such as name, email, and password and conform password etc. Registration is compulsory for accessing the library system. Using login module, a registered user can login to the system by giving the correct user name and password. Both users and administrator have to provide correct username and password to enter into the system.

Login module - Sample Android code
We have to define two TextView to read username and password from the user.

```
<EditText
  android:id = "@+id/editText2"
  android:layout_width = "wrap_content"
  android:layout_height = "wrap_content"
  android:inputType = "textPassword" />
```

```
<EditText
  android:id = "@+id/editText1"
  android:layout_width = "wrap_content"
  android:layout_height = "wrap_content"
/>
```

The above code displays button with Login text and onClick property of the button is set. Login function which is defined in java will be invoked whenever the button is clicked.

```
<Button
  android:id = "@+id/button1"
  android:layout_width = "wrap_content"
  android:layout_height = "wrap_content"
  android:onClick = "login"
  android:text = "@string/Login"
/>
```

The Login method of onClick get the username and passwords entered by the user using **getText()** and **toString()** method and match it with the correct text using **equals()** function. A sample output of Login/Registration application is given in figure 3.

```
EditText username =
(EditText)findViewById(R.id.editText1);
EditText password =
(EditText)findViewById(R.id.editText2);

public void login(View view){

if(username.getText().toString().equals("user1")
&&
password.getText().toString().equals("tiger")){

  //correcct password
  }else{
  //wrong password
}
```
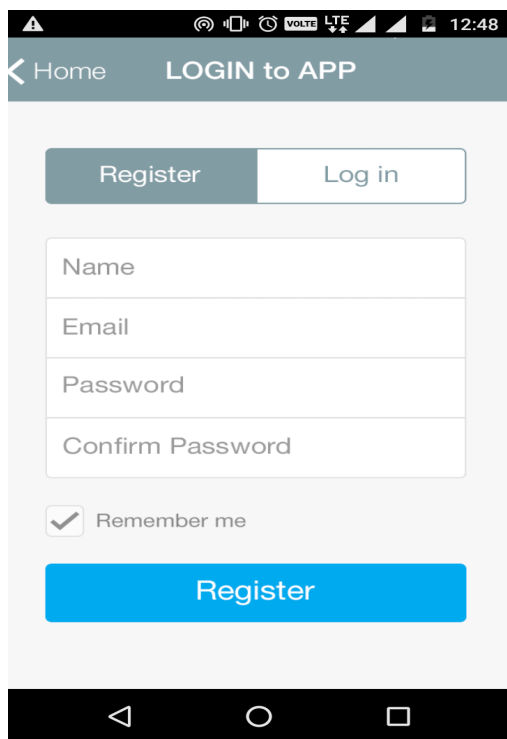
Fig3. Sample output of registration/Login

Interface of user module

User has to enter correct username and password to access this module. Using this module user can search books in the library. They also can check the due dates of their borrowed books.

Interface of Administrative module

Administrator can access this module by giving username and password. Administrator can enter the new book details such as book name, author, edition and publication by clicking AddNew button. He can also check whether specified book is available for the user or not. He can update the library book database whenever students borrow/ return the books.

This system has following limitations. All book details are entered by the administrator only. Administrator only can update the database. This Library Access System can be accessed only by android users.

Advantages of the proposed system

This system automates all the operations of library and removes manual process. User registration / login can do using this system. User can also check the due dates and availability of books.

Conclusion

In this paper, an android application for Library Access System has been proposed. This system provides necessary interfaces of administrative and user module. Using this application, administrator can manage the library and users can easily access their library account to check their due dates, availability of books in the library. This system saves user's time by making online request.

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