Android based Attendance Management System Offline and Online accessibility

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Abstract: *There are several applications which are developed where a Professor can access the student's list from the server and can directly upload the attendance to an online database present in the server. All the applications that are developed, till date, are limited to internet connectivity i.e. they work only if internet connectivity is provided due to which still the pen and paper based attendance is followed in many institutes. Thus, in this paper we propose, an android application where the Professor can even mark attendance when the system is offline i.e. in absence of internet connectivity which can be stored as cache in local memory and when the system goes online or is connected to internet later, the attendance stored in cache can be uploaded on the server database automatically.*

Keywords*: Android-based management system, Client Server Framework, Online mode, Offline mode.*

I.   Introduction

In most educational institutes attendance of a student plays a vital exercise to allow knowledge transfer. Pen and paper based attendance is known to be the most commonly used system to take attendance. This approach could undoubtedly allow the students to cheat about their attendance, where a student may sign for an absent student. Besides, such attendance sheet could easily be misplaced or lost.

Such manual methods of taking students attendance have been proven to be difficult and time consuming. Thus, to avoid such malfunctioning, several applications are developed through which a Professor can directly upload the attendance of student to an online database in the server from an android application through android device with availability of proper internet connection. But still due to unavailability several institutes uses pen and paper based attendance only.

Therefore, it is our objective to develop an application which can be used even when internet connectivity is unavailable. The application will allow the user to use the application in the offline mode. Thus, attendance take during offline mode the data will stored inside local memory as cache. Then later whenever the user finds internet connectivity he/she can connect to the internet and the database will automatically uploaded to the online database present in server. With that in mind, we have aimed to address this issue by having a system with minimal hardware requirement and at the same time, enhancing the mobility aspect of the existing attendance systems.

II.   Existing System

The system we are introducing in this paper aims to address the issues of capturing student's attendance in class through the use of an Android-based attendance management application. With the expectation that most lecturers already own an Android device, the adoption of this proposed system will definitely cut down the cost of hardware and its maintenance.

With the vision of an end product in mind, we started the first step into the system development by listing the features to be provided by the application. To use the application, a lecturer will first need to install the apk file on their Android device. Once the application is started, the lecturer will need to log in to the application by supplying their user id and password. Upon a successful authentication, the user will then be redirected to another page that prompts them to select the course code and student group to be monitored. The list of students registered in the selected group will be downloaded into the Android device from an online database server. Based on the downloaded list of students, the application can then be used to check student attendance by marking them present or absent from options provided by the side of every name. Once all students have recorded their attendance, the updated attendance list can then be uploaded by the lecturer back to the online database server or can be stored in local memory.

III. Problem Statement

Attendance Management System is software developed for daily student attendance in schools, colleges and institutes. It facilitates to access the attendance information of a particular student in a particular class. This system will also help in evaluating attendance eligibility criteria of a student. A click on the mouse, the system will be able to produce the students' attendance report thus reducing the need for manual labour which is prone to human errors and time consuming. This application is built for automating the processing of attendance. It also enhances the speed of performing attendance task easily. The Student Attendance will be based on the department and section. According to the department wise and section wise the attendance will be marked for the students. It includes present, absent and leave column for each student so that they would mark the attendance period wise. The student and the staff have unique user login id and password available. The student can only view the attendance record on weekly, monthly, and whole semester basis. The staff can view as well as modify the attendance record. Printing facility for attendance record is available for both students and staff. Hence, we can summarize it as,

-Paperless record keeping
-Making use of local memory if the internet is not connected
-Self-sufficient Android app
-Develop and implement an attendance system.
-To create an Android mobile application to provide a User Interface to interact with the system

IV. Architecture

The Android based Attendance Management System is designed based on the client-server framework. By referring to the system architectural diagram, the system consists of a local database, an online server with database and the Android based application and its hardware part as the client. Whenever the device is not connected to internet and whenever the lecturer takes the attendance, the same will be stored in the local database of the android system in its local memory. Thus, whenever the client goes online or gets an internet connectivity, the database from the local memory will be updated to the server automatically.

Providing the user to upload students attendance even when they are not connected to internet as well as when they are. Thus, when needed, the Professor can refer to the database that is saved online as well as the database in local memory. This module can be divided into two modes that is

- Offline mode and,
- Online mode
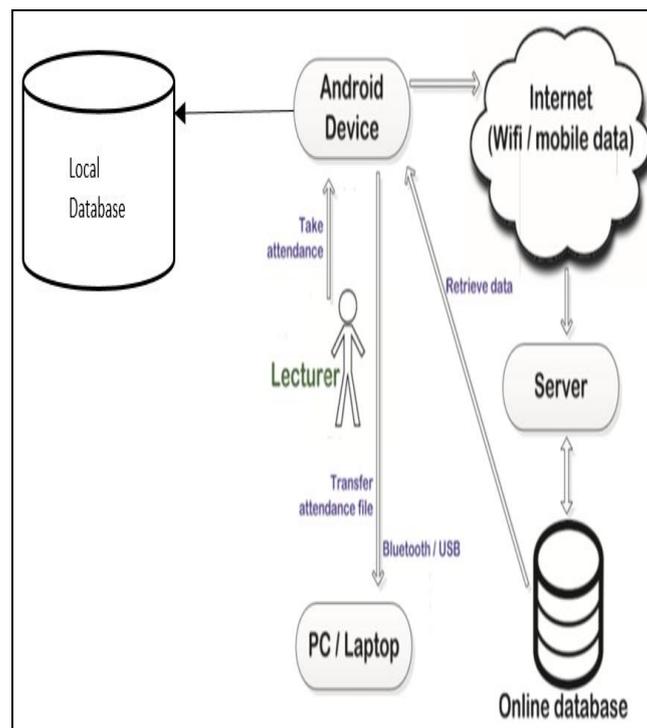
Fig. 1. Architecture

# V. Module Description

5.1. Offline Mode

The main challenge accepted by this project was to develop an attendance management application such that the Professor can upload the attendance for the student even when he/she is not connected to internet. Even after so many existing systems, many institutes still follow the paper pen attendance system by maintaining a log book due to lack of internet connectivity. The use of this application is very easy. Every Professor just needs to install this android application in their android phones and login using their credentials. Once the Professor logs in successfully, the date and the class has to be choosen, the list of names of students in that particular class will come into view. Once the names appear the teacher can mark the respective student present or absent and then click on button save. Thus, once the attendance is done the app will create a local database which will store the attendance of the student for the specific date and class.

5.2. Online Mode

The attendance taken by a professor should be in such a way that even the other staff can access to it, as well the students can check their attendance. Thus, there is need for the updating a database on the server such that database can be shared among several users. Once the attendance is taken by the professor, he/she has to connect their android device to internet so that the local database can be linked to the online database present on the server and the database on the server can be updated from the database that is present in local memory.

The database is composed of a number of tables, which are used to store different groups of records required to manage the student attendance data. Basically, there are four relational tables specifically named as; 'groups', 'lecturer', 'courses' and 'students'. Thus, online database provides the user to share the data among others and also provides better security and reliability to store the data.

The Ofline process can be shown by a flow chart in Fig.2,
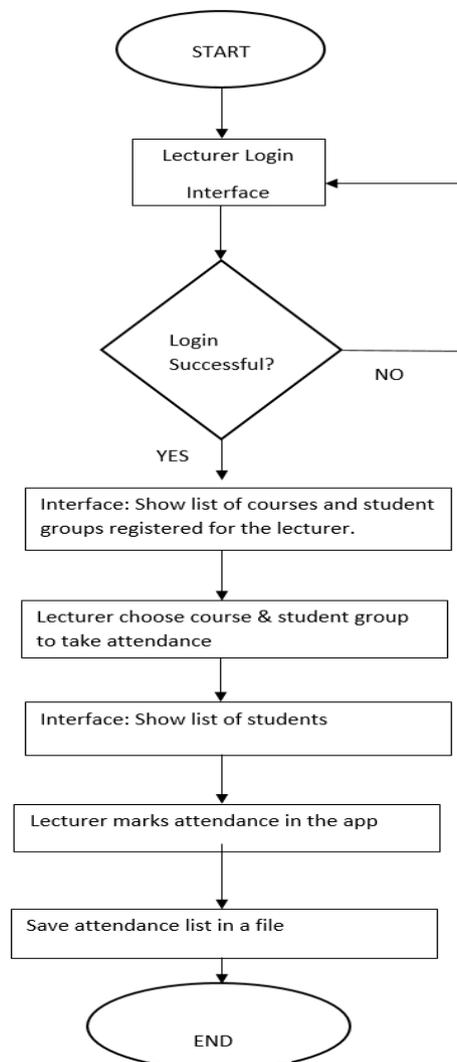
Fig.2. Flow Chart for Offline Mode

The Online process can be shown by a flow chart in Fig 3,
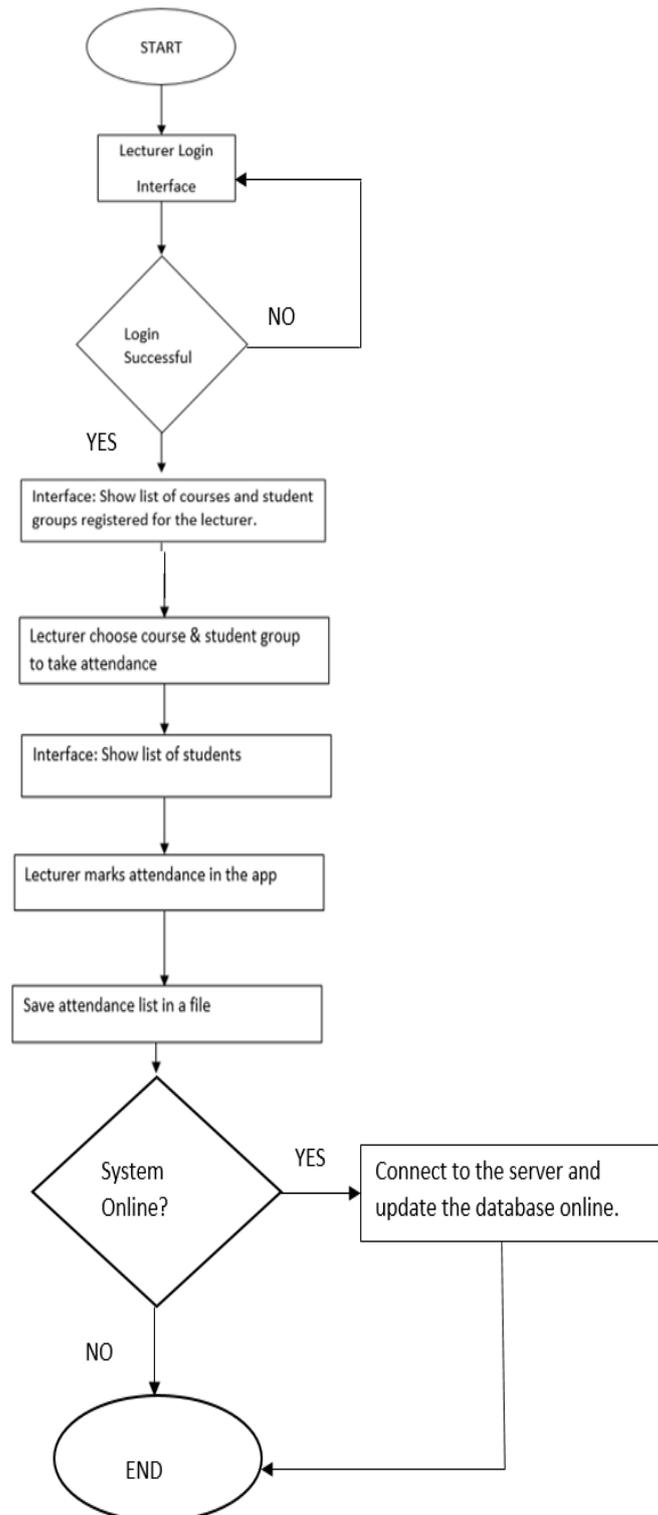
Fig.3. Flow Chart for Offline Mode

VI. Implementation

The android application that we are proposing can be developed using android studio. Android offers a unified approach to application development for mobile devices which means developers need only develop for Android, and their applications should be able to run on different devices powered by Android.

The following snapshots (Figure 4-8) illustrate the attendance – recording process based on the flowchart as in Figure 2&3. Figure 4 shows the default front interface once the application is launched. Figure 5 shows the login form where the user (lecturer) needs to enter their username and password. Upon a successful login process, the lecturer will be taken to the next interface (see Figure 6) where the lecturer's name is displayed along with a list of their respective hour number and groups (class). Figure 7 shows the students' name list (or Roll numbers) from the database.
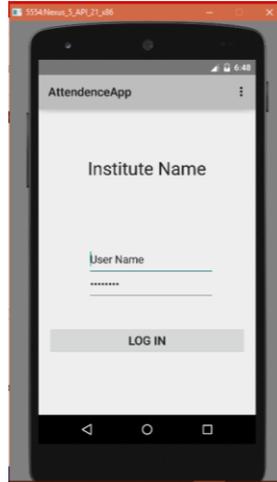
Fig.4. Login page

Fig.5. Entering Id & Password
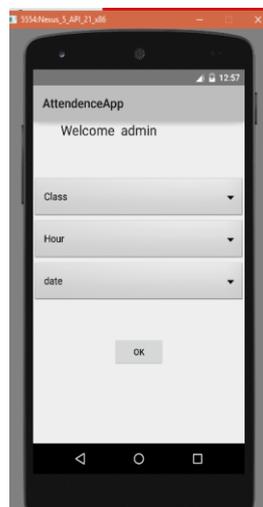
Fig.6. Selecting Details
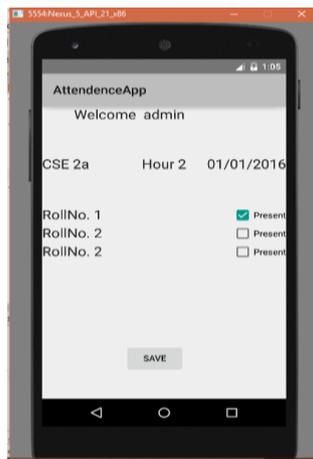
Fig.7. Marking Attendance

Thus, once the attendance is marked, the present students are given attendance rest are marked absent and the data is uploaded on the server's online database is the internet is provided or else the data is stored inside the local memory if the internet connectivity is not provided.

Acknowledgements

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