

Attendance Tracking System Using Wi-Fi

Neil Sharma, Behara Manoj Kumar, Ajay Patil, Abhilash Kale, Nikhil Lambe

Abstract— The attendance tracking using traditional approach is really a cumbersome process. The individual has to maintain the attendance record in registers and files using pen and paper. The problem with this approach is that it requires lots of paper which are the part of our non-renewable natural resources. We are in the age, where we have to think about sustainable development. Managing the attendance using mobile phones, provide an alternative way in this direction. The project emphasize on the development of a standalone system that can track the attendance of the students with the help of Wi-Fi. Communication between teachers and the parent is also an important issue that should also be considered, because parent can only get the information about their ward after the interaction with teachers. So, we also tried to bring the system which enables parent to receive the information of their ward of regularity on daily basis.

Index Terms—Wi-Fi, Communication, Attendance, Tracking.

I. INTRODUCTION

We have seen over the years that the process of manual attendance has been carried out across almost all educational institutions. The process is not only time consuming but also sometimes inefficient resulting in the false marking of attendance. Today, we need not maintain pen and paper based attendance registers. Following this thought, we have proposed an attendance monitoring system based on the concept of Wi-Fi which is implemented as an Android mobile application that communicates with the database residing on a remote server. The mobile application would require connecting to the database using Wi-Fi technology. Our project is an efficient and user friendly Android mobile application for an Attendance Monitoring. The application will be installed on the user's smart phone. It intends to provide an interface to the teacher who will require minimal details to input for marking of attendance of a particular class of students. The teacher will open a portal for the students as soon as he enters the classroom, the student's mobile with the android application installed on it will mark the attendance if it is in the range of the Wi-Fi. Apart from that, the application would support strong user authentication and quick transmission of data via the Wi-Fi service. Lecturers will login to the phone application and get connected to the server. After login, they will take attendance using mobile phone.

Manuscript received April 20, 2015.

Neil Sharma, Department of CE, University of Pune, NBN SSOE, Pune, India.

Behara Manoj Kumar, Department of CE, University of Pune, NBN SSOE, Pune, India.

Ajay Patil, Department of CE, University of Pune, NBN SSOE, Pune, India.

Abhilash Kale, Department of CE, University of Pune, NBN SSOE, Pune, India.

Nikhil Lambe, Assistant Professor, Department of CE, University of Pune, NBN SSOE, Pune, India.

Staff within the same class track attendance differently even when provided with sophisticated tracking systems. Many track attendance only at the beginning of class which can lead to tardy students being counted as absences, that's why this application is built. In his mobile application student can also register his name, branch, year and with the roll number. If the student wants to see their attendance then they can see it by the application, after entering the authorized user id and the password. Staff can also upload any notice through the mobile which is visible to student by their own smart phone.

A. BASIC CONCEPTS

Here the idea is to demonstrate a small expenditure, reliable standalone system that is in contact with Android application connecting to the remote main server with an efficient wireless cum cable networking terminology.

The data which is sent from student's mobile to the access point is encrypted first and then stored in the database. The rights for manipulating the data of the student as well as teacher are with the administrator. The system is proposed to be transparent to maximum extent so that student and teacher can view the attendance respectively in a sorted manner. The application is also intended to send the information to the parent to reduce the communication gap.

II. LITERATURE SURVEY

The attendance tracking system is a tedious process. The system is used to track the attendance of the students in a systematic manner automatically. The development of the application reduces the inefficiency of the attendance system. So Before developing the tool it is necessary to determine the time factor, integrity and security of the system. Once these things are satisfied, then next step is to determine the operating system and language can be used for developing the tool. The deployment of the system application is done in a systematic manner with the various hardware as well as software requirements. Before building the system the above considerations are taken into account for developing the proposed system.

Many systems and applications have been developed in this regard to solve the automating the process of attendance, but almost none of them fulfill the whole requirements. Many problems can be seen on those existing applications, some lack GUI, some lack automating the process of informing the care taker or guardians. There are softwares available for automating such problem of attendance but being the fact that desktop consumes more energy or power than the mobile.

Nowadays, attendance is generally taken on the piece of paper in register. Using mobile for taking attendance, consumes not only less energy but also helps in reducing the wastage of paper and can serve as green way for taking the attendance. Use of paper, nowadays can be eliminated by the use of mobile or automating the process of attendance. As now generally every person has a mobile device and thus can read the text message or the email easily on the spot to get the status of their ward in their college or school.

Thus although there exists a system for implementing this feature as desktop application for particular college or school or any other place, But with the mobile, we get solution that is green and eco -friendly i.e. consume less energy and power and also provide a good interface and easy to use for taking the attendance. Mobile being portable can help teachers or any other user to take attendance on their mobile and view the various statistics to analyze the attendance record of the student.

III. MATHEMATICAL ANALYSIS:-

Set Theory:

Let S (be a main set of) $\equiv \{SDB, S, T, AL, V,G,IP\}$

Where,

SDB is the copy of the server database. This database is responsible for storing student information related to interactions with server.

S is a set of all the registered students using the server database and services from the server.

T is a set of the two databases that we have stored one for the personal details of the particular student and the other for the user id and password.

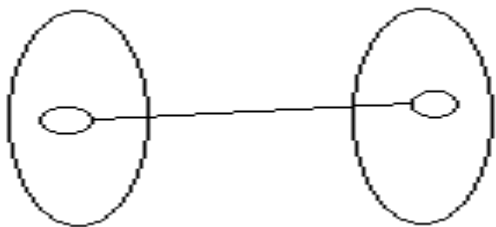
AL is a set of algorithms applied on the encrypted input mobile data to get desired results. .

Vis set for all Registered and Authorized teachers which is valid and not repeated.

G is set parent users or non- registered which is not valid for attendance marking, but have privileges for viewing information about particular student.

IP is the attendance marked by student.

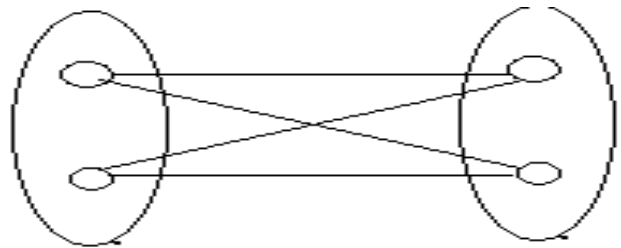
Functionalities:



F1=Register (Add information): This function has a list of actions that the admin performs only once when he has to register student and teacher for the attendance system. This data can be added / updated by the admin only

F2=Validate (): In this function depending on student or teacher details which is saved in the database, the input from the user is cross verified from the database and then further process can be performed.

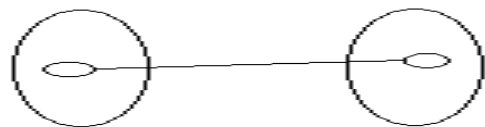
F3= Login (): The data that is sent from student mobile to server where the username and password is matched if the transaction is committed then the student is able to VIEW his own personal attendance data.



Every input given to this function F1,F2,F3 will have only 2 possible values, i.e. Boolean values of true or false.

F4=Attendance Mark (): In this function the students logs in through his registered username and password, and using IEMI number his/her attendance is marked.

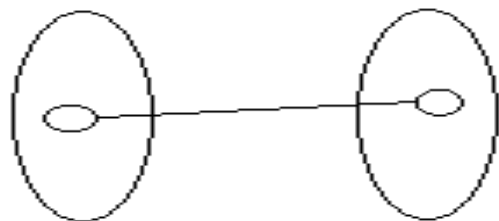
F5= Attendance Update (): In this function the attendance given by students is updated at the end of the day



Function F4 and F5 have one to one mapping as one student can only mark attendance once in a day and this is one to one .

F6= AttendanceView ():This function is invoked once the student marking attendance is over. The staff/teachers can view the result as well as manipulate them .The attendance can also be shown to the respective student but they are not allowed to manipulate them This is to be displayed over the portal and can be accessed by all the users.

F7= Notify (): This function is used to notify the parents about the attendance percentage of their respective wards.



Function F6,F7 has one to one mapping as attendance result is displayed for one student each.

IV. IMPLEMENTATION

The implementation phase of the project is the real hurdle in the proposed system.This project will be the platform independent, i.e.; project can run on any operating system.

Because any one can access the project and upload it for their use.

Modules Implementation:

It is designed especially for students to keep track of their attendance level and get notified when attendance drops down. It has two modules. They are-

1 Staff Module: The main purpose of the staff module is to provide security. This module is specially designed for staffs, which use mobile phone to take attendance. Each staff enter username and password before enter in to attendance list. If username and password match, he/she can enter in to attendance page.

1.1 Attendance Entry Module:

The purpose of Attendance Entry Module is to enter the attendance using cell phone. In this module Lecturer takes the attendance using the cell phone. Lecturers select the branch, semester and year. After this session he enters in to attendance page. Here staff makes a mark on the absentees.

1.2 Database Module

The first function of this module is to update the attendance list from the cell phone. When the attendance list from the cell phone receives, server automatically updates its database. The server updating the database whether any change from cell phone occurred.

1.3 Adding the time table:

Adding the time table is very simple as the application stores all the university subjects and simply we have to select from the drop down list.

1.4 Email Module:

This module is used to send email to the parents to notify them their attendance, curriculum activities.

2 Student Modules:

2.1 Add Details:

Add your name, registration number ,address IEMI number, parents email ids, username and password. This is a onetime process.

2.2 Dashboard:

You can view all pages from the dashboard. You'll be shown the dashboard every time the app runs.

2.3 View bunks:

You can either view all bunks or view by subject. View by subject displays a list of subjects and on clicking it takes you to the summary. View all lists all your bunks which are arranged by date.

2.4 Alerts:

In order to view the overall attendance clicks on alerts button in dashboard. Alerts page also notifies you when the overall percent drops down.

3 Server Module

In this we simply build the database module which is used to store all the data of the staff as well as student also.

Any one authority member can easily access the data from the server as their use.

V. PROPOSED SYSTEM

We tried to implement a system which overcomes the limitations of the existing approach. Taking the attendance on mobile phones instead of traditional approach is one step forward to automated system. Doing the same work on mobile phones not only saves our resources but also enables the user

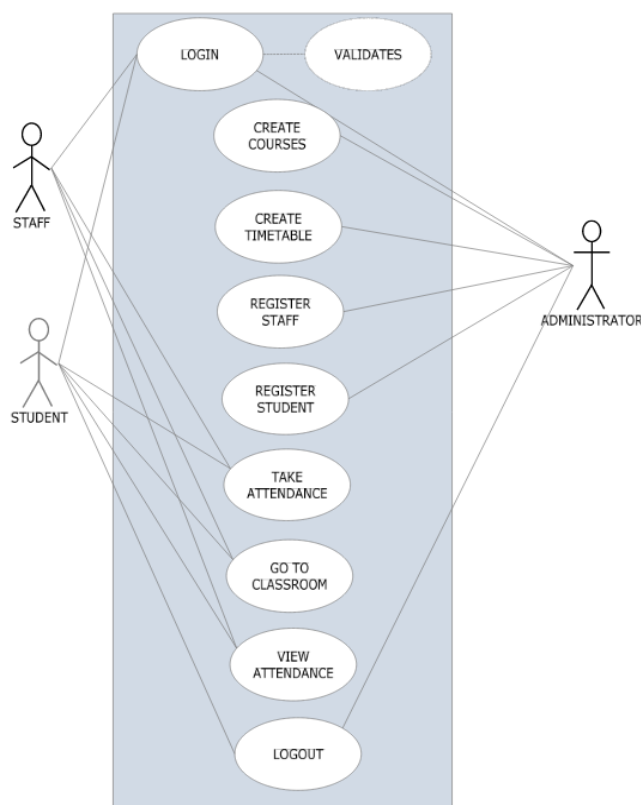
to get easy and interactive access to the attendance records of student. We are trying to make an application that can help the teacher to take attendance of the students through their own mobile device.

The problem is that guardians or parents are not able to get the status of their child time to time or we can say on monthly basis. The application that we are building can allow teacher to take the attendance through their mobile devices, manage records, and inform their parents or guardians about the status of their ward.

VI. SYSTEM WORKFLOW

Real Time Workflow-The teacher will open the portal as he/she enters the classroom and the students will have the particular timeslot to mark their attendance. As the attendance is marked automatically when the student's mobile interacts with the access point inside the classroom so the student is barred to enter the class within particular time.

The attendance is marked with the help of a unique number send to the remote administrator .The data will be transferred in an encrypted format with the help of the AES encryption algorithm. The data then will be stored at the server which is controlled by the administrator, manipulation of the information of the student such as editing the name, mobile number, and the parent's information. The data related to the staff members is also maintained by the administrator only.



VII. SOFTWARE AND HARDWARE REQUIREMENT

HARDWARE REQUIREMENT

System : Pentium IV 2.4 GHz.

Hard Disk : 80 GB.

Attendance Tracking System Using Wi-Fi

Monitor : 15 VGA Color.

Mouse : Logitech.

Ram : 512 MB.

SOFTWARE REQUIREMENTS

Operating system: Windows 7Ultimate

Front End : NetBeans 8.0,Eclipse

Coding Language: Java, Android

Database :MySQL

VIII. SCREEN SHOTS OF IMPLEMENTANTATION

ADMINISTRATOR:

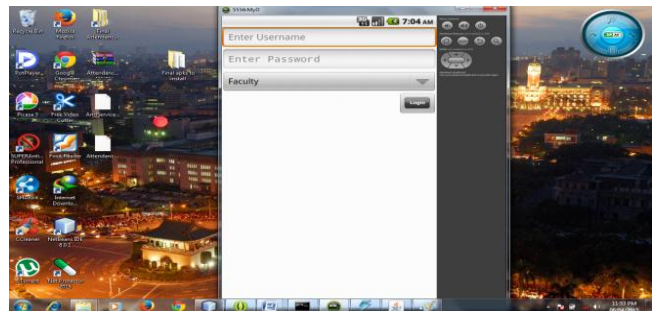
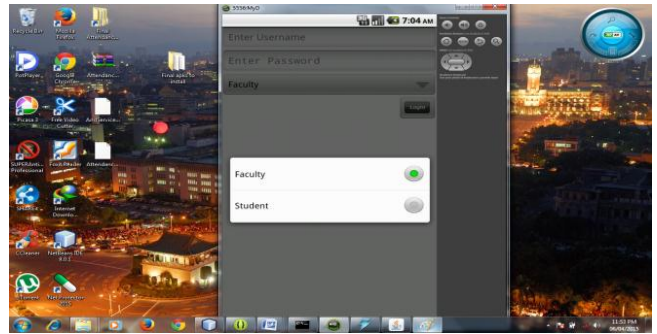


FACULTY:



ANDROID APPLICATION:

FACULTY



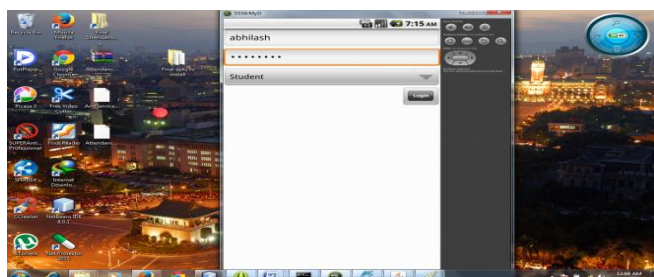
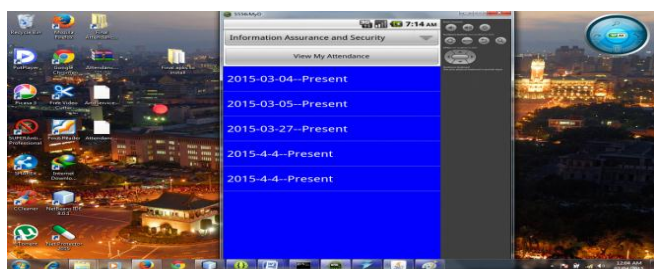
campus. These are some future works which can be implemented further.

REFERENCES

- [1] Frank H. P. Fitzek, Frank Reichert "Mobile phone programming and its application to wireless networking"
- [2] Neha Mittal "Minor Report On Mobile Augmented Reality Application for Android Operating System"
- [3] "Announcing the ADVANCED ENCRYPTION STANDARD (AES)". Federal Information Processing Standards Publication 197. United States National Institute of Standards and Technology (NIST). November 26, 2001. Retrieved October 2, 2012.
- [4] Dag Arne Osvik¹; Adi Shamir²; Eran Tromer² (2005-11-20). "Cache Attacks and Countermeasures: the Case of AES" (PDF). Retrieved 2008-11-02.
- [5] "Wi-Fi Mapping Software: Footprint". Alyrica Networks, Inc. Retrieved 2008-04-27.
- [6] Mateti, Prabhaker (2005). "Hacking Techniques in Wireless Networks". Dayton, Ohio: Department of Computer Science and Engineering Wright State University. Retrieved 2010-02-28.
- [7] "Quatech Rolls Out Airborne Embedded 802.11 Radio for M2M Market". Retrieved 2008-04-29



STUDENT



IX. CONCLUSION:

The application offers reliability, time savings and easy control. It can be used as a base for creating similar applications for tracking attendance colleges and in offices or any workplace. and seminar will help the lecturers to reduce their workload by reducing the time and calculations required to update the attendance manually. Students and their parents will also view the attendance and curriculum details using the website. And students also see their attendance at any time. In this paper we have discussed about the problems caused due to the use of traditional approach in taking the attendance and solutions for that through the use of mobile and provide a new approach.

The goals achieved in following this approach: Automate the attendance management using mobile devices to reduce the dependencies on natural resources and also provides a way of communication between parents and teachers. Integrating the student's mobile phones with the application so that the application detects automatically the students that are present is a great thing to be added in the future. Integrate it with the centralized server of the college/school so that the server will send the mail to the guardians of the absentee's students and informing them about his or her ward. We will try to generate the daily report that will be submitted to the centralized server for its record. This can also use Wi-Fi technology for communication between device and central server within