

Smart Attendance Application

Aakruti Buddhiwant¹, Mudita Bharkshe², Rushabh Bansod³, Mayur Chandekar⁴
^{1,2,3,4}Department of Computer Engineering, INDIA

ABSTRACT

Attendance Systems were Developed even before the Mobile Devices had been Introduced to the Market and therefore it is need of an hour to take Attendance using Various Technologies thus Making it Smart. In the Traditional Model of Attendance System, RFID Readers and Bluetooth/infrared were used but it made the system Restricted, Complex and error prone Replacing the pen paper Method to take Attendance. As the Emergence of GPS based system a Smart way of Attendance can be Introduced. In this project we will implement a smart attendance Application wherein the Teachers on their Mobile device will Just create a fence on Google Map as per the latitude and longitude; the Students Coming inside that fence will be able to give Attendance. As the Increase in smart phones the Students will just give Attendance through their Android phones through fingerprint and attendance will be recorded for that given lecture and will be sent to the cloud. The Students can view their Attendance and if Attendance is less than a given threshold than IVR call or SMS will be sent to the Parents Registered Number. It will Reduce the burden of Teachers to take Attendance and update their Records and analysis

Keywords— GPRS, IMEI, Wi-Fi

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. Nowadays, mobile devices have become a way of life for students especially in higher education. Computers are now being replaced by compact smart phones that can be t into pocket and can be carried anywhere. A smart phone based attendance recording is an efficient technique for teachers as well as students. Recording student's attendance is not an easy task as there are various issues such as authentication and authorization. Following this task we

have implemented, we have proposed an attendance management system based on the concept of web services which is implemented as an android mobile application that communicates with the database residing on cloud. It can either connect through General Packet Radio Service (GPRS) or Wi-Fi technology. It will provide a user friendly and efficient for managing the student's attendance. The application will support strong user authentication and quick transmission of data. Teachers will login to their mobile phone application for a particular lecture and will create a fence i.e. area on the Google map to take attendance of students present in that area, the students present under that area of fence can directly give their attendance through their registered mobile phone which is through their mobiles IMEI number, which will indicate a unique identification to a particular student and provide strong point of authentication.

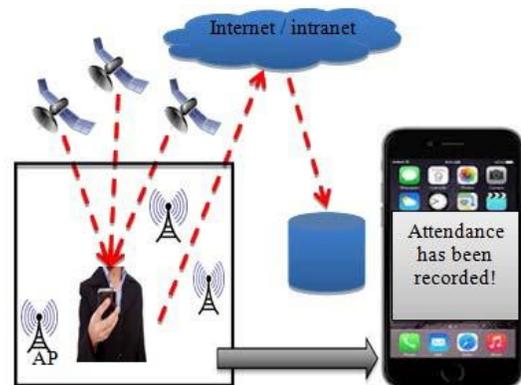


Figure-1 General model of a mobile attendance system using GPS enable device.

II. METHODOLOGY

GEO-fencing

Geo-fencing is a virtual barrier that used the global positioning system (GPS) or radio frequency identification (RFID) to define geographical boundaries. Its function allows an application to trigger when a device

crosses a Geo-fence and enters (or exits) the boundaries defined. The alert sent can be an email or SMS. Most of the Geo-fencing applications incorporate with Google Earth that allows us to define boundaries on top of a satellite view of a specific geographical area. Some application defines boundaries by longitude and latitude or through user-created and Web-based maps.

With the alert function, where the location-aware device of a location-based service (LBS) user enters or exits a geo-fence, the device receives a generated notification. This notification might contain information about the location of the device that is suitable to notify parents when the leaves predefined areas.



Figure 5: Geo-Fencing Technique

GEO-fence query

As discussed earlier, to capture the border of a location with multiple coordinate, geo-fence technique is used. With this technique, the teachers will create the area of a working site area using a map such as Google Map. using geo-fence query. With the query, the teacher can create a virtual boundary of the maps. The coordinate values of the area will be stored in the database. The system will compare the GPS of the student at the particular time whether they are in the boundary or outside the boundary. The teacher can only clock in or clock out within the boundary. There is a real world application that used this technology. Song et. al. used the geo-fence technique to extract information of truck loading time and hauling time of a heavy construction operation by simulates the data collected. With this information, the time management operations can be monitored. For the purpose of the attendance system, the input varies in terms of hardware to minimize the input to validate student.

III. PRIOR APPROACH

Traditionally attendance was taken using pen and paper which was a tedious process for teachers. Drawbacks aroused were time consumption and hard work. Later on many new technologies were created to make attendance system more simpler and efficient. Following are some techniques which used but are not that accepted.

RFID based attendance

A RFID based system detects and identifies tags and is used to mark students' attendance. A computer has been used as the medium to perform this task. The RFID reader detects the presence of a tag and the system processes this information on the computer according to the programmed instructions. The tractability, availability and receptiveness of the technology highly affect the ease with which RFID system can be integrated into current operations. The system provides an effective solution to lecture attendance problem by organizing the design of software and hardware along with efficient exchange of data between the RFID tag and reader which is interfaced with the computer.

Bluetooth based attendance system-

A Bluetooth Smart chip is programmed and configured such that it works in connection with the Android application via Bluetooth. Every student is given a specific tag, which can then be detected by the application via Bluetooth Low Energy. When he/she attends the lecture, a serial number (related to each student's SAP number) of the tag is associated with the student database entry. Therefore, every time a student carries his/her card and is attending the lecture the entries will be entered into the database with the time stamp as the lecturer moves around the class and the application detects the tags. Also, the application is configured to detect tags only within a particular range in order to avoid detection of tags that are outside the class.

IV. OUR APPROACH

Algorithm:

- 1 Login by teachers on the application using valid username and password
2. Search for GPS location
3. Read GPS Co-ordinates
4. PolyLine creation by teachers to create a fence
5. Login by student using biometric fingerprint on mobile application
6. If login successful and student within the boundaries of PolyLine
 - Send the user-id & IMEI number to the cloud
 - Save the attendance & record to the cloud database
 - Calculate the attendance & sent message or IVR call to parent if attendance less than a threshold suppose 50% percent
 - Notify student of given attendance for successful clock in & clock out
7. Else
 - No attendance can be given

Go to step 2

Teacher on their application can login with their username and password or they can register on the application. This makes the teacher to authenticate on their application and valid teacher can only login. The teacher once done with the login can create fence on the Google map so that specified area can be covered to take attendance.

Figure 2: Teacher login into the application

Map management

Teachers can set boundaries for each class. When a particular student comes into the given boundaries specified by the teacher on the Google map attendance can be given by the students using the phones IMEI number which is registered. With this feature, teacher can easily take attendance with less effort.

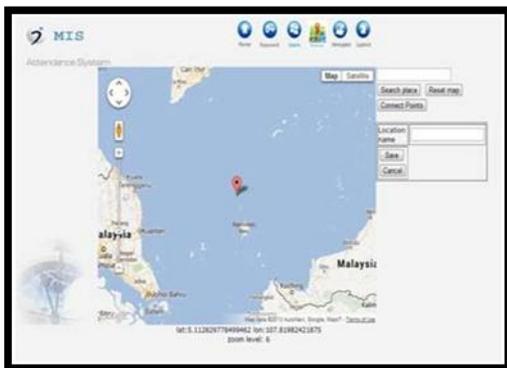


Figure : Fence creation on Google Map

Student Login

Student can login to their application using their mobile's inbuilt fingerprint biometric to give attendance this is used for authentication so that no proxies to the lectures can be given and also make it secure. Student can view their attendance and attendance can only be given if student is inside the fence created by teacher and the IMEI number of students mobile is registered.



Figure 3 : Student login through fingerprint

Database

Cloud will be used to store the attendance, the attendance given by students can be stored on cloud, analysis and report generation is also done. If the attendance of students is less than a particular threshold value then SMS notification or IVR calls will be sent to the parents registered mobile number.



Figure 4: Attendance stored on cloud

V. CONCLUSION

An Android based mobile application for Attendance Monitoring is presented. 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.

REFERENCES

- [1] Ankit Bansal, Ajit Rana, Akhil Bansod , Prafulla Baviskar. Paper Name: Mobile Based Campus Information Retrieval Android Application, 1, International Journal of

Computer Science and Mobile Computing, Vol.4 Issue.3, March 2015.

[2] Ms. Shweta A. Shaha, Ms. Madhuri V. Gorade, Ms. Nutan T. Shitole, Ms. Swati B. Gawade. Paper Name: Smart Attendance Management System, In International Journal of Advance Research in Technology (IJSART), Vol.1, Issue3, March 2015.

[3] M. Makhtar, R. Rosly, S. A. Fadzli, S. N. W. Shamsuddin and A. A. Jamal. Paper Name: IMPLEMENTATION OF MOBILE ATTENDANCE APPLICATION USING GEO-FENCE TECHNIQUE, ARPN Journal of Engineering and Applied Sciences, VOL.11, NO. 5, MARCH 2016

[4] P. Jessenth Ebenezer, M. R. Mralidharan, S. Srianth, E. Ramesh, Mr.S.Prabhu. Paper Name: Android Application for Student Activity Register, In International Journal of Research Engineering and Advanced Technology (IJREAT), Volume2, Issue 2, May2014.

[5] M. F. Mahyidin. 2009. Student Attendance Using RFID System. University Malaysia Pahang.

[6] Riya Lodhaa, Suruchi Guptaa, Harshil Jaina, Harish Narulaa Paper Name: Bluetooth Smart based Attendance Management System; International Conference on Advanced Computing Technologies and Applications (ICACTA- 2015)