A GEO-Tagging Based Hybrid Mobile Attendance System

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ABSTRACT

Biometrics technologies verify identity through characteristics such as fingerprints, faces, irises, retinal patterns, palm prints, voice, hand-written signatures, and so on. These techniques, which use physical data, are receiving attention as a personal authentication method that is more convenient than conventional methods such as password or ID cards because it uses data taken from measurements and such data is unique to the individual and remains so throughout one's lifetime. Geo-tagging is the process of adding geographical information to various media in the form of metadata. The data usually consists of coordinates like latitude and longitude, but may even include bearing, altitude, distance and place names. By combining the above services, we can help the public and private sector offices like Survey Department, Revenue Department, Electricity department, Telephone Department, Public Works Department (PWD), Transport Department (NH, KSRTC etc.) to take care of the employee's attendance by asking them to install this proposed application in their smart phone.

Keywords: Geo-Tagging, Multilingual, Finger- Printing, GPS.

I. INTRODUCTION

A Geo-Tagging based hybrid Mobile Attendance Management System is an application developed for daily employee attendance in public and private sector offices. It facilitates to access the attendance information of a particular employee. It will also help in evaluating late coming and casual leaves of an employee. The purpose of developing Hybrid Mobile attendance system is to computerize the tradition way of taking attendance. The Employees of a particular department assigned for the fieldwork must travel to remote and far-away areas for their work. In case if the place assigned is too far from the office, the officials must report in their respective offices, give their attendance, and leave to the fieldwork. A web and mobile-based solution be used, by which all the employees can mark their attendance at any place, in time and out time at different locations and multiple times in a day. The proposed system will capture the employee's location and time information is extracted through GPS, thumb impression of employee will be taken and whole information is stored at a centralized server and used for further evaluation.

1.1 Existing System

After visiting some organizations, we found that no proper system to monitor the staff attendance that are at fieldwork. Some companies still use logbook to keep track of the employees' attendance. These attendance records are not precise. Besides, the company still uses the paper-based system to keep track of the records of the staff. This method is not secure because the records may be lost. It is also hard to find certain records using paper-based system. With the paper-based system, employee can also manipulate the time of signing in and out.

1.2 Proposed System

A hybrid Mobile Attendance Management System that uses finger print technology and Geo-Tagging for location identification along with capturing an image at the location, wherein employees can mark their attendance anywhere within time. This solution includes recording of their login time and logout time on different locations multiple times a day. The proposed system can trace the attendance of the employees, to know when they are coming and leaving from work. Besides, the system is able to calculate the total working days of the employees, total of the employees who work over time, total of the employees who are coming late. It will generate reports regarding the attendance of the employees. Geo-Tagging prevents users to give proxy attendances. The controlling officer with admin privileges will keep track of attendance of all employees using this application. The GPS coordinates fetched to check the site location and check the employee's presence in the site.

II. BACKGROUND STUDY

Shoewu O., Olaniyi O.M. and Lawson A, proposed an embedded computer-based lecture attendance management system where a single-chip computer based subsystems (an improvised electronic card and the card reader) were interfaced serially to the serial port of the digital computer. The electronic card is a model of a smart card containing the student identity. The student ID is authenticated by the card reader, which compares the entrance code with the encrypted code on the card swiped through the card reader. The student is granted and/or denies specific lecture attendance based on the result of the comparison by the backend software system running on the PC to which the card reader is serially interfaced [1].

Shehu V. and Dika A, proposed real time computer vision algorithms in automatic attendance management systems using Computer vision and face recognition algorithms and integrating both into the process of attendance management. The system eliminates classical student identification such as calling student names, or checking respective identification cards, but still lacks the ability to identify each student present in class thereby providing a lower recognition rate [2].

Kadry S. and Smaili M, proposed wireless attendance management system based on iris recognition is proposed using Daugman's algorithm. The system uses an off-line iris recognition management system that can finish all the process including capturing the image of iris recognition, extracting minutiae, storing and matching but it is difficult to lay the transmission lines where topography is bad[3].

Nagarajan Ramalingam, proposed Attendance Monitoring System of Students based on Biometric and GPS Tracking System. This paper is a study of a fingerprint recognition system based on minutiae based fingerprint algorithms used in various techniques. This line of track mainly involves extraction of minutiae points from the model fingerprint images and fingerprint matching based on the number of minutiae pairings among to fingerprints. This paper also provides the design method of

fingerprint based student attendance with help of GSM. This system ignores the requirement for stationary materials and personnel for keeping of records [4].
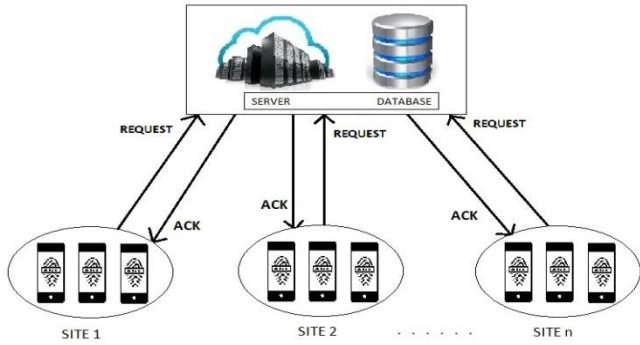
III. DESIGN

Fig 3.1 System Architecture

System architecture shows the conceptual model that defines the structure, behaviour, and more views of a system. It is a formal description and representation of system, organized in a way that supports reasoning about the structures and behaviours of the system. The user has to request to the server for service. Once the request is accepted, an ACK sent to the user to confirm the update of the attendance.
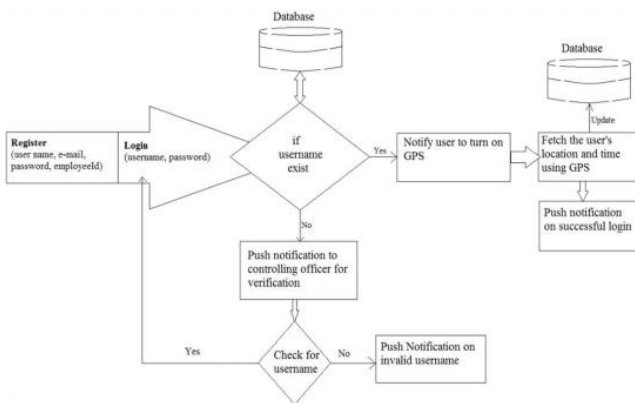
IV. WORKING

Fig 4.1: Methodology

Step 1: Start, after successful login.

Step 2: Check the prerequisites such as android version, fingerprint device hardware, app permissions.

Step 3: If the prerequisites not met display the appropriate toast message and go to step 6, else go to step 4.

Step 4: Check whether any fingerprint is registered on phone, if registered go to step 5, else display appropriate toast message and go to step 6.

Step 5: Match or check the user's fingerprint with the first fingerprint registered on phone, if matched go to next activity, else display appropriate toast message and go to step 6.

Step 6: stop.

V. IMPLEMENTATION

5.1 GPS Algorithm

In the A-GPS, architecture, in addition to a digitized GPS signal, several pieces of assistance data is made available to the GPS algorithm, including:

1. Time stamp: This can be supplied through a cellular network and represents an estimate of the time at which the GPS signal capture was initiated.

2. Approximate location: Typically taken to be the location of the base station from which the mobile device receives assistance data, the approximate location serves as a coarse estimate of the receiver's location. In urban areas, the closest base station is typically within a few kilometres of the receiver. In rural areas, the closest base station can be tens of kilometres from the receiver.

3. Ephemeris information: Obtained through a network, used to compute satellite locations, velocity, and acceleration.

4. Satellite clock corrections: Satellite clocks drift over time. At any given time, clock error estimates, obtained through the network.

5. Differential corrections: As with conventional differential GPS systems, this data is obtained from a reference receiver network and enhances system accuracy.

6. Navigation data: Navigation data is required for coherent processing of long durations of signal. With the right algorithms, transmission of navigation data from the base station to the mobile device can greatly enhance sensitivity.

5.2 Fingerprint Algorithm

Step 1: Start, after successful login.

Step 2: Check the prerequisites such as android version, fingerprint device hardware, app permissions.

Step 3: If the prerequisites are not met display the appropriate toast message and go to step 6, else go to step 4.

Step 4: Check whether any fingerprint is registered on phone, if registered go to step 5, else display appropriate toast message and go to step 6.

Step 5: Match or check the user's fingerprint with the first fingerprint registered on phone, if matched go to next activity, else display appropriate toast message and go to step 6.

Step 6: stop.

VI.RESULTS

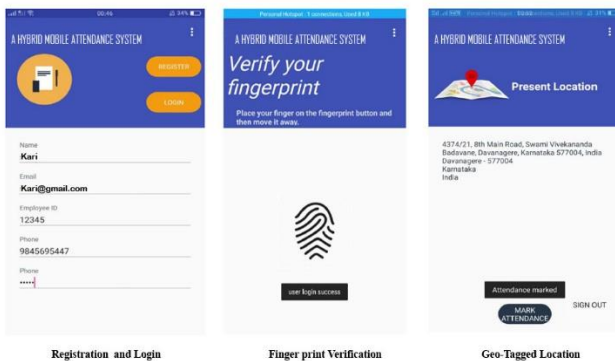Registration and Login | Finger print Verification | Geo-Tagged Location

Fig 6.1 : Snapshots

VII. CONCLUSION

The Developed application is specifically developed for Field working employees. The Developed application helps in Effortless Attendance Management. It works for Go Green Initiative. It Avoids proxy and Saves time of the Employee. It also provides multilingual support. The Developed application probably can be the best way to avoid proxy and will definitely help employee save his/ her time and energy by reducing the travelling time. We designed an android application as almost every person or every employee will have a Smartphone of his/ her own.

VIII. REFERENCES

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