An Android Based Automated Attendance and Employee Tacking System

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Abstract – *This paper introduces a smart, automated way for companies to be able to consistently track and monitor their employees, especially when they are always on the move. It aims to benefit both the employers and the employees through an android application that ensures that employees do not need to physically be present at their work place to give attendance, i.e., to inform that they have started their daily work, and also make sure that employers always have an eye on the work of his/her employees. The application makes use of biometric features for authentication, GPS (Global Positioning System) for location tracking of the employees and also provides time and task scheduling facilities for complete control of the employees' work.*

Key Words: **Employee monitoring, fingerprint authentication, employee attendance, employee location tracking, employee job scheduling**

1. INTRODUCTION

For any company to flourish, it is of utmost importance that their employees are genuinely doing their work, and hence it becomes the company's duty to take all measures to ensure that the employees actually are doing their job. Since earlier days, manual systems have been extensively used to mark the attendances of company employees.

Manual systems are those in which the employees are required to gather at a particular spot and put in their signature as a mark of attendance. Some of the disadvantages of using such a system are damage of the attendance record, extra overhead of another employee only for the job of maintaining/calculating attendances of all employees, etc. With the current boom in technology, it doesn't make sense for companies to continue using such an attendance system to keep track of attendance of their employees. A better solution would be to use automated attendance which cuts down a lot of the extra work to be done only for the sake of attendance of employees. There have also been various implementations of automated attendance, the best way being the use of smartphones.

Using smartphones in this context enables several features to be easily and efficiently implemented like location tracking, fingerprint scanning, instant communication between employees and employers, etc. The attendance of an employee is marked automatically when he starts doing the work he is supposed to do for that day. In this paper, we give importance to companies having employees that have most of their work to be done outside of the company location. The employees are tracked by the employers through the help of a website, which is created specifically for the purpose of complete monitoring and control of the employees.

Another important feature in this application is location tracking, which is obtained through GPS (Global Positioning System) tracking. This not only lets the employer constantly track the employee's location, but also allows the employee to easily choose a required job destination from his personalized application. The application also provides a time and task schedule for the employee's reference, so that he/she can easily finish of the allotted work for the day. It also provides a way for the employers to ensure that his employees are sincerely getting their work done without slacking off.

This application also makes use of biometric features for authentication. Here, we have implemented fingerprint scanning [1] for this purpose. Since nowadays smartphones with in-built fingerprint scanners are available at low costs, our application proves to be more efficient and easy-to-use than many of the already existing systems.

2. EXISTING SYSTEMS

The following are some existing systems [2] that are minutely related to our system.

2.1 AnID

AnID is an application used to supervise employees with face recognition, fingerprints, PINs and GPS. It includes features like check in / check out on phones or tablets, optional offline operation, synchronizing when the device becomes online, payroll and attendance data download in a spreadsheet, management from 'Boss' phone (e.g. approve new worker's faces), project / task based costing support, GPS location for all actions, with geocoding, real time attendance and check in location tracking, employee data, time sheet upload/download. But the limitation to this application is that it requires an external device for fingerprint scanning/ face-recognition.

2.2 Boomr

Boomr is an employee time tracking software that is a mobile time clock which tracks employee hours, overtime, projects, communication etc. It has the following features: GPS capabilities, automated reminders, overtime tracking, financial reporting and project tracking. Even though this application takes care of tracking and reporting, it does not make use of any authentication techniques, and it also does

not allow the employer/manager to track employees real-time.

2.3 Hubstaff

Hubstaff is software to know about when and what the employees are working on, the limitation being that, it doesn't give where the employees are working, i.e., their location. Hubstaff time tracker runs as software on desktop or as a mobile app making it easy to track time. Once the time is tracked, the employer can invoice clients, pay employees, see in-depth reporting, etc. Another limitation, compared to this paper, is that Hubstaff provides an interface for the purpose of organization of work for the employee. It doesn't allow any kind of involvement of the employer.

2.4 Clock In

Clock In Portal is a user-friendly, advanced online employee time tracking software allows employers to effectively manage users through a number of remarkable features and our clock in clock out app enables employees to do so with the click of a mouse. Time-tracked information is kept securely at their servers, so it can be easily accessed at any time. Their comprehensive system supports businesses by providing an employee time clock, online timesheet management, and payroll processing and access points. Even though this software provides a few efficient features, it fails to include employee authentication. It also only give the employer information about the employee's clocked in and out time.

2.5 Where's My Staff

It is an attendance & tracking app that can replace the traditional attendance machines. It uses the NFC technology founded in smart phones, to convert these phones into tracking cards. This attendance app can also be used as a GPS locator, so that the employer can locate and track employees/ colleagues who work outside the company. As it uses NFC technology, it is clear that the employees' travelling distances are limited.

2.6 NutCache

Nutcache provides teams with a business-oriented agile solution for managing the entire project delivery lifecycle. It does not provide any employee-employer communication or employee tracking facilities for the employer or any biometric authentication. It is a project organization and time tracking application only.

3. PROPOSED SYSTEM

In the proposed system, employers make use of a specifically created website through which they can view a list of all employees, track them real-time, assign them with daily tasks, monitor their work and obtain a final report about all the employees. New employees may be added anytime by providing required details and also a password, which the employees will be informed about. The website can be personalized according to company preferences.

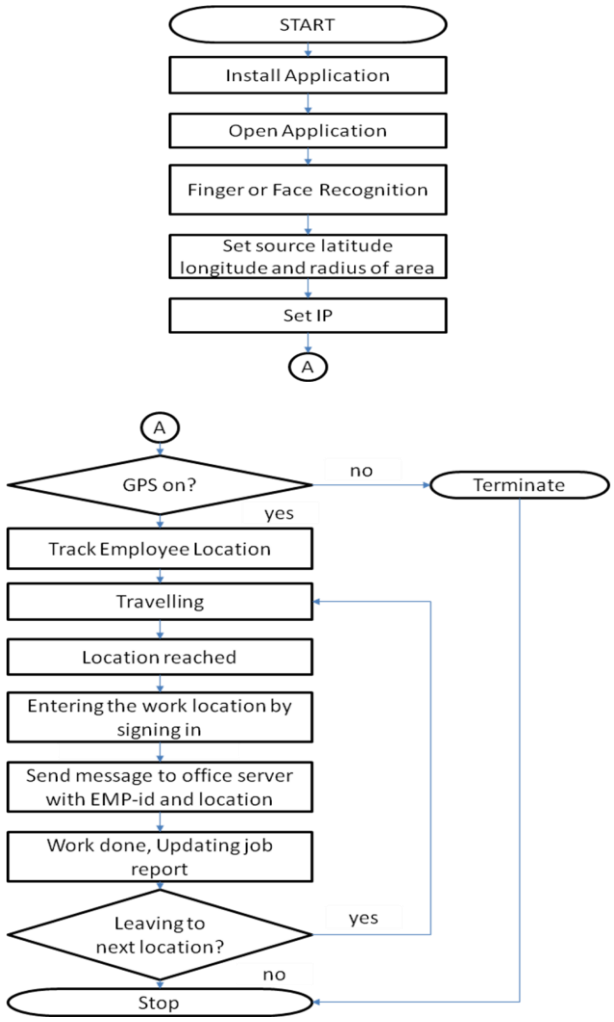

Fig 1- Flow of operation for the proposed system

The employees make use of an Android application through which they can receive daily work/tasks, view their location on map [3] and also find routes [4] to task destinations get a time schedule and also personalize their application and profile. The employees initially have to sign up using the password that is given to them, by their employer. Later on, they only need to give their ID and scan their fingerprint for signing into the application.

4. SYSTEM ARCHITECTURE

4.1 Software Architecture

The software architecture mainly consists of the employer web page, application program, database and the server.

- Employer Web Page: The website is developed using html, PHP (Hypertext Preprocessor), CSS (Cascading Style Sheets), JavaScript. The webpage is used by the employer to keep track of each of his employees.

- Application Program: The application program is developed using Android Studio [5]. It uses Java and XML files. Java is used for the working part and XML for the user interface.

- Database: JDBC (Java Database Connectivity) is used here. The database is used by the server to fetch details about the employees. MySQL is used to implement the database. It stores employee-specific details like name, ID, location, break details like duration, start/end time, task-specific information like completed/not completed, start/end time and schedule details like job locations, time allotted at each location, etc.

- Server: The server is implemented on PC (Personal Computer) using XAMPP server solution software.

4.2 Hardware Architecture

The basic requirement of the location based attendance and employee tracking system is an android device on which the developed application is run. The application is only for employee use. The other requirement is a personal computer on the server side for storing database and also for the employer to use the employer website.

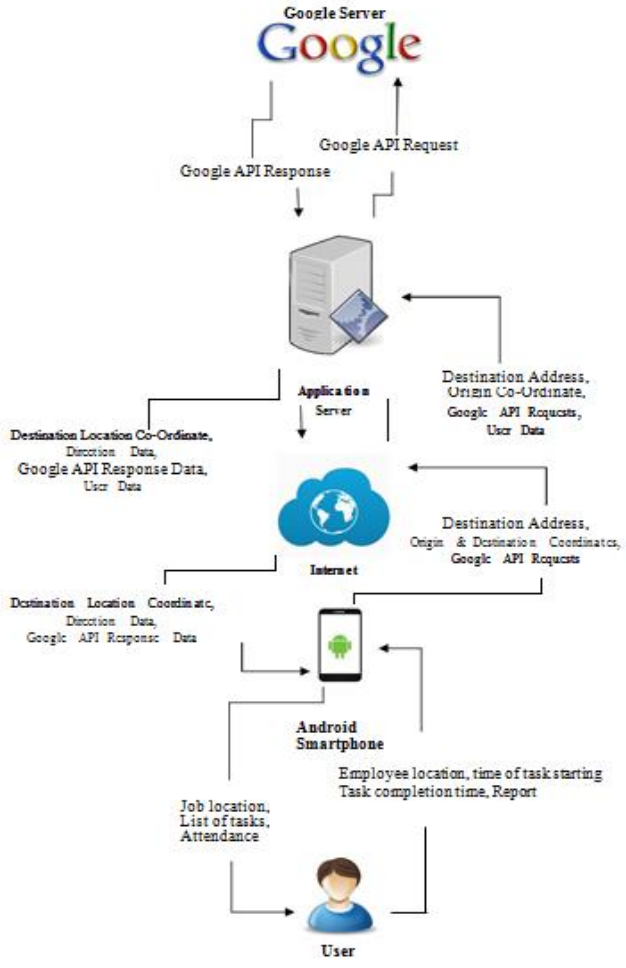

Fig 2- System Architecture

5. CONCLUSION

The main purpose of coming up with this project is to create an easy-to-use and efficient platform on which employers can easily monitor their employees' daily work. The outcomes of our project are, better employee supervision at work site, guaranteed work efficiency as a result of automatic time scheduling, maximum reduction of employee truancy, efficiency in terms of time, cost and effort for employer and better working environment, due to buildup of employee-employer trust.

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