Smart Attendance and Payroll System

Pranali Dhawas[1] (student), Mayuri Nimbulkar[2] (student), Osheen Waghmare[3] (student), Priya Kawale[4] (student) & Dipali Mokasare[5] (student)

Computer Science and Engineering

Tulsiramji Gaikwad Patil College of Engineering and Technique

pranalidhawas10@gmail.com[1] , maahinimbulkar@gmail.com[2], osshoosheen5@gmail.com[3] , priyakawale9@gmail.com[4] , dipalimokasare1@gmail.com[5]

Abstract:

In this project an employee tracking system based on Android operating system was developed. Over the years the process of manual attendance has been carried out which is not only time consuming but also provides erroneous result. Automated time and attendance monitoring system provides many benefits to organizations. All the activities of the Employee will be monitored using this system. Following this thought, we have proposed a smart location based time and attendance tracking system which is implemented on android mobile application on Smartphone reducing the need of additional biometric scanner device. The location of an organization has a specific location, which can be determine by the GPS. Apart from this we added SQL injection technology for providing security to login id, etc. Scheduling information and time off requests are often considered part of personnel tracking; as this information will enable managers know when employees are expected to actually be in the office or other work areas. This system is mainly made up for the marketing purpose, so that the admin can trace the location of employee to check whether he/she at work place or not, with this the live image can be taken of the employee. This system is really very helpful for the managers to monitor their employees through mobile phones. It was implemented using JAVA programming language, and the result was stored in SQL Lite database. We are using data compression technique on the data so that it takes less storage. Data was collected using document analysis and field Methods and the application of relevant analytical methods like bar-charts were used to interpret the facts collected. The developed system was able to increased productivity, reduction of cost, instant access to employee attendance record.

Keywords

Keywords should be the keywords used in the article or related to the articles, Each keywords should be separated by comma or semi-colon, E.g. International Journal of Research, Edupedia Publications, ISOAR Journals, Book Publisher

1. Introduction

This work is designed for employers to track their employee, but it can be used by anyone who wants to track other person with prior permission as this application needs to be installed on the person whom we are going to track. This application is developed using the Android SDK and eclipse and server side is developed using PHP and tracking is plotted on Google maps using JavaScript. For this application to work properly the location services should be turned such that the app can get location through GPS or from the network.

Fig1.1: Client Server Diagram

This system consists of two components: Client and Server.

The client will be the android application or android phone, it is designed in such a way that it has very few elements and very less user interaction and the interval at which location updates are received can be either hard-coded or selected, but ideal timing will be every 10minutes.

In this system server will receive data sent from the client side and it will save it in a database and display to the end-user who will be the employer or the person who wants to track on map.

The above mentioned problems are being solved with two main components: GPS and Network; these

two features are present in almost all smart phones now.

For first time once user installs the app he should start the app and after that every 10minutes or any predefined time the application will start automatically and fetch the location and send to server.

2. Literature Review

[1] **Sonal et al (2016)**, worked on Employee Tracking and Monitoring System Using Android. In their study the provided different security profile on same smart phone. They used dynamic database utility which retrieves data or information from centralized database. They provided separate mode to employee when he enters company premises. Through smart phones all information about the employee phone like their SMS history, Incoming calls, Outgoing calls, Employee Locations, Data usage, Web browser history, and Unauthorized Call History details are tracked. The necessary condition is that Employees should have the Android phone whereas Manager Activities are also monitored.

[2] **Nirmal, et al, (2016)**, worked on Employee Surveillance System Using Android Smart Phone, Their system integrates Employee monitoring and GPS location Tracking System using Android phone. All the activities of the Employee will be monitored using this system. The system works on 3G communication between the terminal ends. All the activities of an employee on his cell phone and computer, like data usage, all incoming and outgoing calls, web browsing and secured document modification and illegal transfer of company's informative details like blue print, stocks, projects etc. will be set under surveillance. Not only this, the global geographic position of the employee will be traced using GPS. Therefore the organization will be set to surveillance that will restrict the unwanted usage of its resources by the employees during working hours. The system was beneficial for the progress of the organization and will allow the Manager to check the dedication of his employees towards work.

[3] **Shermin et al (2015)**, worked on a Smart, Location Based Time and Attendance Tracking System Using Android Application. They proposed a smart location based time and attendance tracking system which is implemented on android mobile application on smartphone reducing the need of additional biometric scanner device. The location of an organization has a specific location, which can be determine by the GPS. Each employee's location can be determined by the GPS using smart phone.

[4] **Avinaash et al (2015)**, worked on Mobile Attendance Management and Employee Registration. Staff attendance management and employee registration is a mobile application which can be used by the staffs to login their attendance through mobile phone and track other staffs location through mobile phone. Manual registration in biometric systems and entering in the attendance catalogues in different physical locations is the current system used in all the colleges. The staff will get updates regarding their attendance regularly from the admin as they login and log out so that they can keep a track on their attendance by using this application.

[5] **Nirmal, et al (2016)**, worked on Employee Surveillance System Using Android Smart Phone, Their system integrates Employee monitoring and GPS location Tracking System using Android phone. All the activities of the Employee will be monitored using this system. The system works on 3G communication between the terminal ends. All the activities of an employee on his cell phone and computer, like data usage, all incoming and outgoing calls, web browsing and secured document modification and illegal transfer of company's informative details like blue print, stocks, projects etc. will be set under surveillance. Not only this, the global geographic position of the employee will be traced using GPS. Therefore the organization will be set to surveillance that will restrict the unwanted usage of its resources by the employees during working hours. The system was beneficial for the progress of the organization and will allow the Manager to check the dedication of his employees towards work.

[6] **Ashwini et al (2015)**, worked on Employee Monitoring System Using Android Smartphone. In their study all activities such as incoming, outgoing, missed call, SMS history, web history, data usage, unauthorized call list/web site list are stored on centralized database. Manager can see that history by logging into centralized server. Manager can also trace out employee's current location (through GPS).Employee are going outside of company premises then manager get alert message in SMS format. They analyzed the employee behavior by using numbers of unapproved calls and exceeding data usage (good/bad/average/loyal).The device which is given to employee should be android based device. Manager does not need android device. It may be any device. This system is very helpful for the manager to find out the activities which are done by employee.

[7] **Priti et al (2015)**, worked on monitoring employee's smart phone using android application. Their system uses Android based mobile phones for the software to be run. The mobile device in the hand of the Employee should be an Android based device and the Managers may have any kind of mobile device, since the manager is going to receive alerts from the Employee in SMS format only. For convenience, the alerts are also stored in the

centralized server like the details of incoming call, text and multimedia messages and the timely location update of their Employee and their attendance.

[8] **Nitin et al (2015)**, worked on Mobile Activity Monitoring System Using Android Spy, Their system was implemented for tracking the daily activity of the users with their android mobiles. The information such as missed call, incoming call, outgoing call, call duration, incoming SMS, outgoing SMS along with its date and time will be tracked and updated to the server this server will be monitored by the administrator. This information can be maintained for security purpose of the organization such as leaking the confidential data and maintaining policies of organization.

3. Formulation of Present Work

3.1. Existing System:

Several techniques and methods have been carried out effectively to monitor employee attendance. In the current work all, process is carried out by manually. All the records are generated by some elected representatives. Representatives are not concerned in producing report amidst the session or according to the prerequisite on the grounds that it takes additional time in computation. At the end of session the workers who don't have Easy going Leave and Restorative Leave will get a notice.

The given employee tracking system is not that secure that our proposed system because anyone carry another mobile and get the proxy of that person but we proposed a system with live image. We are taking the photograph of the employee.

3.1.1. Disadvantages of existing system

In the existing system the Managers cannot get the Employee's activity information in the mobile through text, like SMS and Calls.

The Managers doesn't know the Employee's current location. There is a possibility of data loss during the message transfer from one mobile terminal to another mobile terminal due to 2G.

Also in existing system the employee behavior is not calculated so that organizational growth may be less, to overcome this problem we can implement the proposed system.

3.2. Proposed system

The problem which is occurred in the existing system, are overcome in proposed system. The user authentication is one of the major factors in the proposed system. Every employee is authenticated based on his/her unique user identification number or id. This unique identification number is the number which is given by the office (administrator). The identification number along with other information is
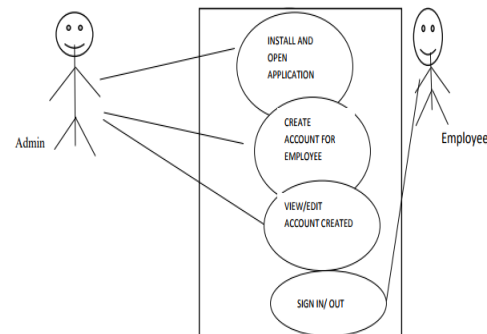
Fig 3.2.1: Use Case Diagram

also saved in the employee device such as date of joining, email id, contact no, designation, user name, etc.

At first employee has to install the required system **.apk** files into their android device. Mobile location service has to be ON when the system was running. If mobile location service is OFF then the whole process will not go further, so we will give notification to the employee to ON the mobile location system. Mobile location service helps to trace the employee location. When the employee enters the office area, the employee has to open the android app, login to the application and automatically the employee id, local time of the device with his/her location which is counted as login time of that employee. But at the time of login there are some chances to hack a data so to avoid this kind of things we are using SQL injection which provide security.

Here the admin has three authorities that are: To install the application, Create account for employee, View and Edit the employee account and user has the only authority to sign IN and sign OUT our the application through his/her unique id given by the admin. In this way we can remove all the bugs in the existing system.

4. System Architecture

The application can be used in Android based cell phones for running the implemented software. In this system we can use different modules. There are two apps are used: Employee app and Server app. The employee phone uses data will be stored in centralized server app. Mobile device which is in the hand of the Employee should be an Android device

and the Managers may have take any mobile devices, since the manager can get the alert through text messages only. For detailed data it can be stored in the centralized server like the details of incoming call, text and multimedia messages and the timely location update of their Employee.
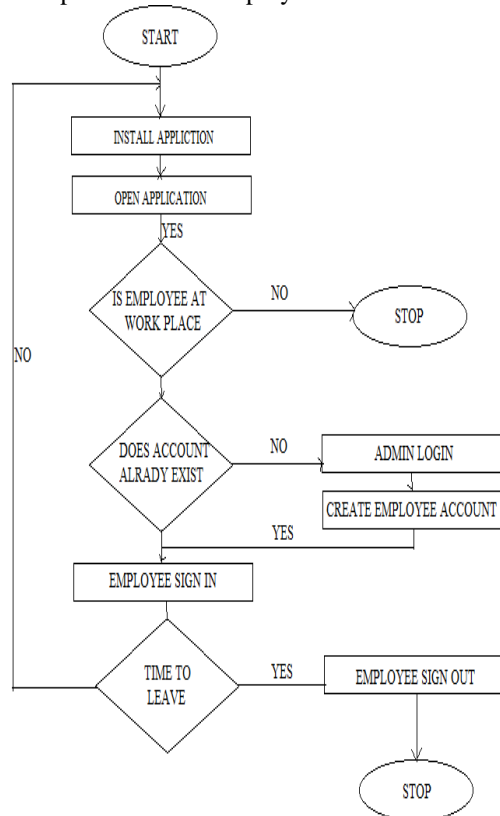
4.1: System Architecture

Managers may later login into the centralized server and view the details of their Employee's mobile usage. When a mobile terminal communicates with another mobile terminal, it is necessary to establish pairing between two mobile terminals before their communication occurs between two terminals. When the employee mobile terminal crosses a particular boundary region an immediate alert message send to the manager mobile phone using 3G network and simultaneously messages stored in the centralized server. Data stored are secured using encryption algorithm USER TABLET (module 1) This table is made for the use of normal employee which is works in the organization. The user have android phone contain call log, SMS, web browser features. They will be enabled with the 3G connectivity. MANAGER'S TABLET (module 2) these desktops are especially for the use of the employee monitoring. The manager should be able to control the function of whole organizational employee from a single centralized server

5. Formulation of Modules

5.1. Admin module
5.2. Attendance module
    a. Login module
    b. Authentication module
    c. Location tracking module
5.3. Database module

5.1. Admin module
The principle of the Administrator module is to maintain secured data. This module is maintained only to Management, where mobile phones are used for attendance. Each employee registers their user name and password which gets stored in the admin database. If the user name and password does not match, they will not be able to log in for attendance.

5.2. Attendance module
The attendance module is used to enter the participation by utilizing cell telephone. By using the application, the employee can login their attendance through mobile phone.

a. Login module
The employee should enter their valid user name and password for logging in otherwise there login will not be validated and will not be able to pin their attendance.

b. Authentication module
The purpose of authentication module is to provide security. It is the entry module of application. Each user enters his/her valid username and password to enter into application. If username and password is matched, application gets started or the login is done successfully.

c. Location tracking module
When the employee login in the application, the GPS location should be ON and if in case it is OFF then the application give a notification to the employee to ON the GPS location system. Finally on the basis of GPS system, the location of the employee will be traced.

5.3. Database module
The database module will contain all the information about the login time, date, with their image on the server. On this basis, the admin can calculate the salary. The capacity of this module is to produce the rundown of employee that who all are logged IN then the admin can download the list from the database. Generated data is in large amount so the must be large space so we will first compress the data using data compression technique and then load to the database.

6. Methodology

User authentication is one of the major factors in the proposed system. Every employee is authenticated based on his/her unique user identification number or

ID. This unique identification number is the number which is given by the office (administrator). The identification number along with other information is also saved in the employee device such as date of joining, email ID, contact no, designation, user name, etc.

At first, the employee has to install the required system .apk files into their android device. Mobile location service has to be ON when the system was running. If mobile location service is OFF then the whole process will not go further, so we will give notification to the employee to ON the mobile location system. Mobile location service helps to trace the employee location. When the employee enters the office area, the employee has to open the android app and login to the application and automatically the employee ID and local time of the device with his/her location which is counted as login time of that employee. And we load the all data to the admin server.

7. Pictorial Representation

The figure shows employee account creation activities. The employee is meant to fill the form shown in figure7. before an will account The be the created. detail of the form includes the

employee's full name, the office position, the email address, the password, designation, date of joining and the phone number, means registering on the application himself.

Fig 7.1: The Employee Account Creation Panel

At successful account creation, the employee can then sign in and out whenever he comes to work and leaves from work using his email and password. The interfaces for sign IN and OUT are shown in fig 7.2.

Fig 7.2: Login Interface

After login, the employee has to upload the live photo on the application for showing his/her presence.
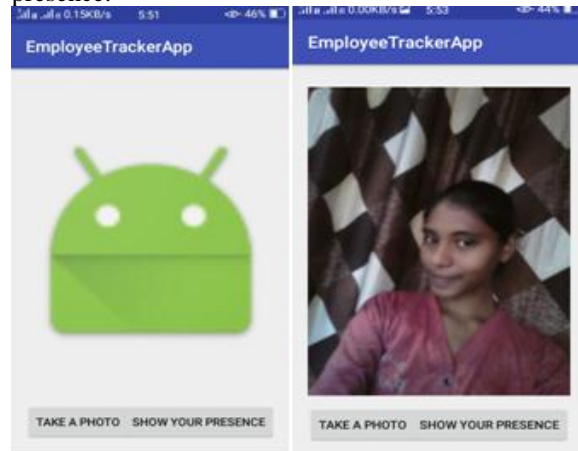
Fig 7.3: Showing Presence

After uploading the photo, with the help of GPS system the location of the employee will be trace, which is shown in the figure 7.4.
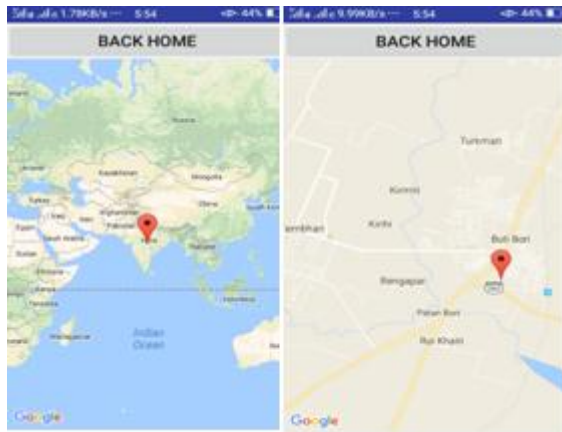
Fig 7.4: Location tracing of employee

8. Advantages

1. Compatible: We can add number of emergency contact. Removing and editing of contacts is also possible.

2. Low cost: No need to purchase this application. It can be shared from one android phone to another phone.

3. No maintenance: Easy to understand while there is no need for the maintenance.

4. GPS Tracking System: This feature track the user.

5. Embedded System: It is all in one system, hence no need to carry multiple devices.

9. Conclusion and Future Work

9.1. Conclusion

This project introduce a smart, location based time and attendance tracking system using android application, which use the location as the core component for attendance tracking using smart phone. This application enables the managers to update the overall performance of the employees in their respective areas. This monitoring system is a revolutionary mobile application which uses Android OS for monitoring time, attendance of employees. There is no need of manual updation of the daily activity details of each employee onto the database. The area is set for tracking using GPS and employee coordinate inside the area border depicts that employee is present in the organization.

9.2. Future Work

Further enhancement will be made to application, so the function becomes very attractive and useful manner than the present one. We developed this system for android platform, but we are focusing on developing this system for iOS platform as well in neat future.

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