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Automated Employee Payroll using Location Tracking and Image Capturing

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***Abstract*—Employee Payroll System is one of the core areas of any business and so is attendance. Accounting and management of are the two most essential parts for any company, which cannot be compromised. Payroll is a serious concern for every small and big enterprise. It is mandatory for all employers to pay every employee as per the rules and regulations. The idea of this work is to focus on maintaining the attendance of the employees in the company as well as working outside the company, like outfielders. Not just maintaining the attendance, this system will also track the employee activities to check whether the employee is actually working or not, if yes, how much work has he done for the day. This system is developed for company management and maintains the prestigious reputation of the company as well. This system will be made using android platform. The main aim to design this system for the companies and their Human Resources, not for the employees.**

Keywords—Global Positioning System, Service oriented architecture , Simple Object Access Protocol, Representational State Transformation , Human Resources, Communications as a Service.

I. INTRODUCTION

In order to obtain a good result of recording the attendance, various methods are used which include either by manual recording or using the attendance machine. Each of these system either lack somewhere or are good to work with because of some reasons. In the manual attendance system, the infrastructure and installation cost is very less, but the accuracy is doubtful. Furthermore, compilation and calculation for preparing the payroll [1] is also more difficult to do than the attendance system that uses machine. The cost of attendance system in the premises would be costly and the number of employees who will use the attendance machine must also be proportional to the number of attendance machine itself, otherwise it could have an impact on the queue when the employee simultaneously wishes to access attendance machine, such as when to come to work and clock out after work. Keeping in mind all the glitches, we have designed our system in a way to overcome these issues. In our system there is a feature to record the employee's position, which is absent in most of the systems. Furthermore, we have introduced an online attendance system on mobile devices and integrated it with the payroll system. It is a system created to overcome the major problems that are faced in manual or electronic attendance system, which is conventionally used today. We utilize Global Positioning System (GPS) [2] and image capturing available in the mobile devices already bye default. We have developed our system based on android platform, since android is the most common platform that is easy to use, free for all and used by most of the people. Using our proposed methodology, the employee can enter daily attendance in their mobile devices and need not be in the queue and even the employees who work outside the office can mark their everyday attendance. Our system mainly focuses on the payroll of the employees who have more of fieldwork or any other work that is not possible in the company premises. The payroll of these employees will be generated through our application, and this will be done by tracking the employee's location using GPS and few other details of the employee like his login time, logout time, name of the company or the place employee visited, etc. The company HR via a web portal will monitor all of this.

II. LITERATURE SURVEY

Table 1: Comparison table for existing systems.

References	Description	Advantages	Disadvantages	Methodology
Analysis, Design and Implementation of a Web-Based Payroll Application Software. [1]	An application software for a large size external firm that would help them to automate the payroll processing and related tasks for the users in that company.	Payroll generation for large no. of users.	Enter and view payroll manually.	PHP, JavaScript, MySQL, Apache web server

Smartphone for next generation attendance system and human resources payroll system [2]	An attendance system utilizes the sensors on the mobile device such as GPS (Global Positioning System), microphone, and fingerprint scanner.	Using GPS, microphone and fingerprint scanner for calculating attendance and payroll. voice recognition Method due to the availability of microphone on a mobile device.	Battery and network issues. Manual checking of payroll and attendance. Works only on android platform.	Mobile with android OS. MySQL database eclipse IDE Apache web server
Smart mobile attendance system using voice recognition and fingerprint on smartphone [3]	An attendance system that integrated with system payroll so that overtime can be calculated automatically, while also providing feature to monitor user who working out of office.	Fingerprint sensor as well as voice recognition.	Only generates attendance. Payroll needs to be calculated manually. Less accurate.	Voice recognition, biometric device fingerprint scanning
Wireless biometrie attendance management and payroll system [4]	Automated system for attendance monitoring by the use of biometrics. Help the companies doing manual attendance and payroll calculations for its users.	Using fingerprint sensors for accuracy.	Not applicable for users working outside the company to calculate attendance and payroll.	Zigbee
Cloud-based web application with NFC for user attendance management system [5]	A cloud-based application using NFC technology for user attendance tracking.	Low cost Low hardware and software cost. No limitations of data storing.	Cannot be efficient when internet is not working	Cloud based system using NFC technology

This system is developed to solve the problems surveyed in the existing systems.

III. PROPOSED METHODOLOGY

Several authors [1-5], have also attempted to work on the same issue of payroll and attendance generation and have presented the effective systems. This system will focus on the attendance and the payroll of the employee working in the company as well as outside the company doing fieldwork. We have integrated both attendance

system and payroll generation, based on the attendance of the employee in one application. We will be tracing the location of the employees who are working outside the company using GPS (Global Positioning System). Through this, we will keep a track on the attendance of the employees outside the company premises. The payroll will automatically be generated based on the attendance of the employee. The HR of the company using a web portal will do all of this. Our system is divided in eight modules. The eight modules are as follows:

1) Android Login: System transmits the data using theemployee's id entered by the employee and it also transmits it along with the image of the employee.

2) GPS Data: The android device constantly transmitsGPS coordinates after particular intervals to the server.

3) Sign-out: The android device sends employee id alongimage during sign-out.

4)Data Retrieval: The web server retrieves GPS as well as employee id along with date time and stores it for furtherreporting.

5) Payroll Report: The web server sends payroll reportdata to HR web application for custom sorting.

6) Salary Calculation: The HR web application now allows the HR to calculate salaries of all employees bydeducting leave pays on a single click.

7) GPS Tracking: HR may view the current position of itsemployee anytime desired.

8) GPS Tracking Report: HR may view the GPS reporting data with latitude, longitude and timestamp.

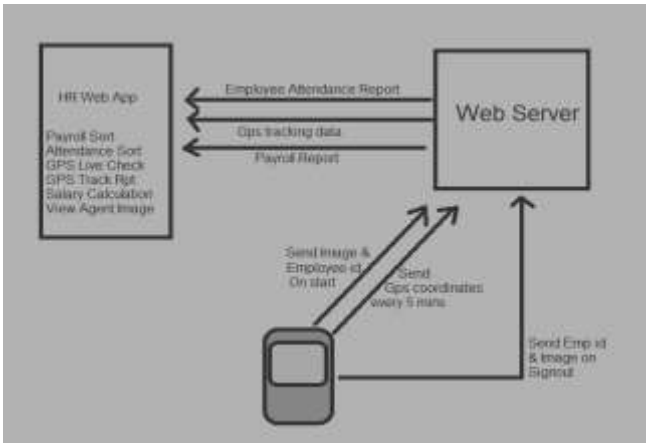

Fig 1: Proposed System

As shown in the fig. 1, the idea of RESTful Service Mash up is explored by integrating individual Web Services which can satisfy end users requirements. To build this system, a proposed a recursive

algorithm. The implementation of the system is done on Android2.2 (froyo), API level 8 and above, which is supported on most of the Android based mobile devices. This system is designed for tracking on site marketing employee using caas concepts. The system uses caas based web service for this purpose, hosted on areal time server to perform all the real time processing with consistency. The android device allows the marketing employee to mark his attendance and then as soon as the app is started, it continuously transmits the employee's GPS coordinates. The system receives these coordinates and allows the HR to check the coordinates of the user through a web application. This system also integrates employee attendance tracking along with basic payroll search and sort facility to the HR. System instructs to take a self-image and transfer it to the server while day sign in and sign-out. All the data is stored along with employee daily GPS tracking coordinates and the HR can browse through it as and when desired using the HR login. We have tracked the employees using RESTful web service using android location tracking services. The HR is provided with the report of basic employee payroll report along with attendance as well as GPS tracking reports as and when desired. [1-5]

V. RESULT AND DISCUSSION

Following are the images of the application from the employee side.

Fig 2: Employee Homepage.

Fig 3: Employee Page.

Fig 4: Image Capturing by employee.

There will be two different logins in the app, one for the HR and the other one for the employees. As shown in Fig , the employee first will see a home page as soon as he opens the application. As shown in Fig 3, he will log into the app using his credentials and see that page. That page will constantly send the employee's latitude and longitude to the HR via a web portal. As soon as he logs into the application, the camera will open automatically. The employee has to click a picture of the place he is at; otherwise, the employee will not be able to login. Once the takes the picture, it goes to the server and it is visible to the HR who is monitoring the employee via a web portal. Once the employee is done with his work, he will log out of the application and here the tracking of the employee will be stopped. The HR traces all the employee activities while the employee is logged in to the application.

This was the employee side of the system, the admin and the HR side of the system is as follows:

Fig 5: Admin/HR login.

Fig 6: Image received by HR.

Fig 7: HR tracing location.

As shown in fig. 5, there are two different logins, one for the admin and one for the HR. The admin login is used to create employee ids for new employees joining the company. The admin page handles the details of the employees and makes changes if necessary, whereas the HR traces employee locations. The HR as shown in fig. 6 receives the image captured by the employee once the employee logins to the system. The HR can also manually check the location of any employee using the employee id as shown in the fig. 7. These are the activities handled and managed by the admin and the HR.

VI. CONCLUSION & FUTURE SCOPE

The Automated Employee Payroll System will focus on maintaining the attendance of employees, managing the employee's expenses, track the employee's activities, and then calculate the payroll for that employee based on the information gathered. After reviewing various papers regarding similar systems, our proposed system has an integrated attendance system and payroll generation application based on the attendance in one system. With the help of regular GPS tracking of the employee, we can oversee the status of the employee when he is outside the company premises. This information is linked to the employee's database and it is used for the computation of the employee's salary. Deductions like leaves, withholding tax are also automated.

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