Smartphone Monitoring System

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Abstract - **This Monitoring System is a software that allows supervisors to monitor their employee's office cell phone. All incoming call details, outgoing call details, text details, emails and multimedia messages can be seen and interrupted by the managers, who can also monitor where their employees are, access a history of where they have been and set up alerts if their employees are going outside of the approved geographical zones, are receiving texts from unapproved numbers or calls from banned persons. This system is really very helpful for the managers to monitor their employees through mobile phones. By using this system, the organisation can avoid the unnecessary involvement by the employees by monitoring their mobile phone usage and also by tracking their current location. The Global Positioning System is used for location tracking.**

Keywords- Global Positioning System, Google APIs, Android Smartphones, Application Stores

I. INTRODUCTION

The objective of this proposed system is to help the supervisors to keep track the employee's official Android smartphone by monitoring incoming call details, outgoing call details, emails, text messages, web access history and geographical location details. After monitoring these activities, the software will transmit the information to a server. The organization's success depends on employees' performance; poor performance is detrimental to the company's success. The objective of business owners is profitability. Creating a well-rounded approach to managing and coaching the work force requires the expertise of a human resources leader and the support of the company's executive leadership. There are a number of reasons why an employer may wish to monitor or record its employees' mobile activities. The employer need to ensure quality of service, detect misuse of company phones, prevent disclosure of confidential information or investigate harassment complaints.

The use of mobile technology and services serve as a communication platform which tremendously influence and improve the efficiency, effectiveness and productivity of work. Monitoring System is an application for Android smartphones. Mobile applications also called mobile apps is a term used to describe Internet applications that run on smartphones and other mobile devices. Mobile applications usually help users by connecting them to Internet services more commonly accessed on desktop or notebook computers, or help by making it easier to use the Internet on their portable devices. A mobile app may be a mobile web site bookmarking utility, a mobile-based instant messaging client, Gmail for mobile, and many other applications.

II. LITERATURE SURVEY

The location tracking of the employee is implemented using Global Positioning System (GPS). GPS uses a constellation of 24 satellites orbiting the earth. GPS finds the user position by calculating differences in the signals, from different satellites, take to reach the receiver. GPS signals are decoded, so the smart phone must have in-built GPS receiver [3]. A positioning component is usually needed in a Location Based Service application to determine the location of user's mobile device. Most of the current LBS services do not require users to input location manually, like giving zip code. The user's location can be obtained by using some positioning technologies, such as satellite positioning, cellular network positioning, Wireless Local Area Network stations or radio beacons.

Amit Kushwaha and Vineet Kushwaha stated that the motivation for every location based information system is to assist with the exact information, at right place in real time with personalized setup and location sensitiveness. LBS is an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of geographical position of the mobile device. These services can be used in a variety of contexts, such as health, work, personal life, etc. LBS include services to identify the location of a person or object, such as discovering the nearest banking cash machine or the where

about of a friend or employee. The main disadvantage of this application is that it is not supported by Firefox as well as by the higher versions of Android.

The application namely Android Application using GPS Navigation to provide the facilities to the users when user is newer to any place through the application named places directory [1]. This application is also used to provide the service for mining the shortest distance between source and destination. The last feature named GPS Alarm of this application provides the notification to the user of arrival of its specified destination while travelling in the form of alarm. This form will take the input from the user for the one of the new feature of the places directory that is tagging. In this user will tag his or her favourite place. And after filling it, the user will switch to next form in which the user will get information related to his tagged place. The Weather Forecasting feature provides service in terms of weather information of specified place with pictorial information.

Manav Singhal and Anupam Shukla proposed the Implementation of location based services through Google Web Services and Walk Score Transit APIs on Android Phones to give multiple services to the user based on their location. The Google Places API is a service that returns data about places defined within the Web Service as spatial locations or preferred points of interest using HTTP requests. Place response specifies locations as latitude or longitude coordinates. The Public Transit API from Walk Score gives the Transit Score for any location listed with in its database and provides convenient access to nearby public transit stops. The Google Places API has the limitations such as users are allowed only 1000 requests per 24 hour period and a credit card is required for authentication for enabling billing.

Comparing to other applications, this application provides more features to monitor the employee activities by using various technologies. By using this application the supervisors can monitor and can save the details about their activities.

III. FUNCTIONS OF THIS APPLICATION

The main functions of this application are Inbound Call Details Monitoring, Outbound Call Details Monitoring, Message Monitoring, Email Monitoring, URL Monitoring and Location Tracking. Inbound Call Details Monitoring and Outbound Call Details Monitoring means call time, the number from which the call came and call made can be monitored. The web access history and emails can monitor by using Email Monitoring and URL Monitoring. Location Tracking can be done using GPS.

IV. SYSTEM ARCHITECTURE

A. Client Side Design

An Android application is developed and installed on the android smart phone. This application 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 devices, since they are going to receive alerts regarding employee's activities in Short Message Service format only. If managers want to login to this application, then the manager's mobile device should be an Android based device. It also keeps the profile of each employee in the organization. The reason to choose Android is because of its increasing consumer reach and popularity.

B. Server Side Design

A server is implemented to store, generate and view the details which are sending by the software which is installed in the mobile phone. The server can receive the data from the software and can store the data in an efficient manner. This helps the manager to review the details and can know the performance of the employees in the organisation.

C. Database Design

A database is needed on the server side to store the information of employees in the organisation. The data which is collected by the software is stored in the database for the further access. SQLite is used as a mobile back-end database and MySQL is used as a portal back end database.

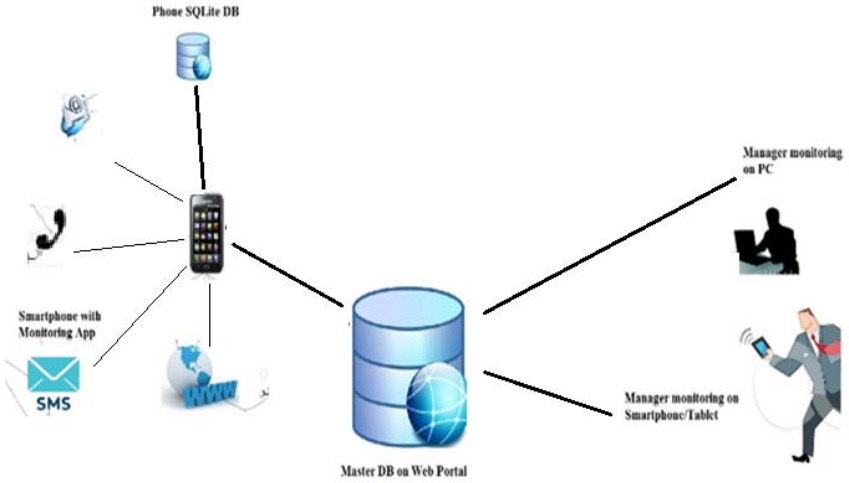

Figure 1. Working of the Proposed System

The Fig 1 shows the working of the monitoring system. All call details, text details, emails and multimedia messages received by the android smartphone will be stored in the mobile database as well as send to the database in the portal. The website has all the information related to the employee activities. It is highly appealing and user friendly. It provides an overview of the employee performance. It also provides information about the employee location during the office time. Thus, the proposed system is faster and fully abolishes the traditional method of taking activity details and documentation to review employee performance.

V. SYSTEM ANALYSIS

A. Existing System

The fundamental goal of performance management in an organisation is to promote and improve employee effectiveness. It is a continuous process where managers and employees work together to plan, monitor and review an employee's work objectives or goals and overall contribution to the organization. Performance management is the continuous process of setting objectives, assessing progress and providing on-going coaching and feedback to ensure that employees are meeting their objectives and career goals. The traditional system does not make any use of the recently developed technologies and relies purely on manual labour. In the traditional system, the managers used to review activity notes and documentation generated throughout the year in order to more effectively assess the employee's performance. The managers also used to conduct performance meeting. The performance assessment or appraisal meeting is an opportunity to review, summarize and highlight the employee's performance over the course of the review period. All the above monitoring and assessment of employee performance were done manually. Thus, the traditional system needs to be replaced and should make way for the new technologies which require less manual labour and are really fast.

B. Proposed System

The proposed system makes use of the Android mobile application to monitor the employee activities and thereby increasing the performance. The registers and notes are replaced with Android smartphones. The managers can monitor the calls, messages, location, emails and web access history of their employee by using website or their Android devices. There will be having an option to update the activities to the server database. If the employee gets any calls, messages or emails, then it will automatically save to the SQLite database of the phone and will update the database of the server. Whenever there is no internet connection is available in employee's smartphone, all the details will be saved to the SQLite database and later the details will be sending by the software to the server database at the time internet connection is available. This proposed system will also monitor the employee's current location as well as the previous location using GPS. The software which is installed in employee's android device will also keep track the web accessing history and then update into the server database. All the details can be managed by the managers without the need of any other person. This system is really effective and faster than the traditional system.

C. Google Map API

Google launched the Google Maps API in June 2005 to allow developers to integrate Google Maps into their websites. It is a free service, and currently does not contain ads, but Google states in their terms of use that they reserve the right to display ads in the future. By using the Google Maps API, it is possible to embed Google

Maps site into an external website, on to which site specific data can be overlaid. Although initially only a JavaScript API, the Maps API was expanded to include an API for Adobe Flash applications, a service for retrieving static map images, and web services for performing geocoding, generating driving directions, and obtaining elevation profiles. Google Maps uses JavaScript extensively. As the user drags the map, the grid squares are downloaded from the server and inserted into the page. When a user searches for a business, the results are downloaded in the background for insertion into the side panel and map; the page is not reloaded. Locations are drawn dynamically by positioning a red pin on top of the map images. The Google Maps API is free for commercial use providing that the site on which it is being used is publicly accessible and does not charge for access. Cell phones are being increasingly used for navigation assistance.

D. Application Stores

Several initiatives exist both from mobile vendor and mobile operators around the world. Application developers can propose and publish their applications on the stores, being rewarded by a revenue sharing of the selling price. Most famous is Apple's App Store, where only approved applications may be distributed and run on iOS devices, otherwise known as a walled garden. With extraordinary speed Google's Android Market, now known as the "Play Store", counting the 2nd largest number of apps and which are running on devices with Android OS. Recently, mobile operators such as Telefonica Group and Telecom Italia have launched cross-platform application stores for the subscribers. Additionally, mobile phone manufacturers such as Nokia has launched Ovi app store for Nokia smartphones.

E. Google Directions API

The Google Directions API is a service that calculates directions between locations using an HTTP request. It helps for searching directions for several modes of transportation, include transit, driving, walking or cycling. Directions may specify origins, destinations and waypoints either as text or as latitude or longitude coordinates. The Directions API can return multi-part directions using a series of waypoints. This service is generally designed for calculating directions for addresses for placement of application content on a map. Calculating directions is a time and resource intensive task. Whenever possible, calculate known addresses ahead of time and store your results in a temporary cache of your own design. Accessing the Directions service is asynchronous, since the Google Maps API needs to make a call to an external server.

VI. PERMISSIONS FOR THIS APPLICATION

In order to access some protected APIs of Android, the application will declare the permission request in AndroidManifest.xml. This file is then encoded into binary format in the APK file. Permissions required for this application are

- android.permission.INTERNET
- android.permission.READ PHONE STATE
- android.permission.ACCESS NETWORK STATE
- android.permission.RECEIVE BOOT COMPLETED
- android.permission.ACCESS COARSE LOCATION
- android.permission.ACCESS FINE LOCATION
- android.permission.CALL PHONE
- android.permission.SEND SMS
- android.permission.READ CONTACTS
- android.permission.RECEIVE SMS
- android.permission.READ SMS
- android.permission.WRITE SMS

Android applications are formed by components. The components of the application are divided into four kinds such as activities, services, broadcast receivers and content providers [4].

VII. MAIN BENIFITS OF THE APPLICATION

a) Helps to increase the productivity of the organization.
b) Customer Service-Performance Management Connection.
c) No need to manually check daily activities and performance of the employee.
d) Helps the managers to alert the employees having low performance.

e) Can make the employee aware about the mistakes.
f) Can identify violation of rules and regulations.

VIII. APPLICATIONS

This system can be used in organizations such as IT industry, inorder to monitor the employee activities and performance. It can be used by the parents to protect and monitor their children even when they are away and can monitor the effectiveness of advertising campaigns by comparing tracking reports before and after. Field service management is possible. Companies with a field service workforce for services such as repair or maintenance must be able to plan field workers' time and be able to operate these departments efficiently. Also, mobile sales professionals can access real-time locations. Trailer tracking can be done for load carrying vehicles. It can also be used as a theft prevention and retrieval device. Police can simply follow the signal emitted by the tracking system and locate the stolen vehicle.

IX. CONCLUSION

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 incoming call details, outgoing call details, messages, email, web history and location. There is no need of manual entering of the daily activity details of each employee onto the database. It completely abolishes the traditional way of calculating performances. This will considerably reduce the paperwork and save ones precious time. This application makes good use of the recent mobile development technologies and thereby increases the overall performance of the employees.

REFERENCES

[1] Bagrecha Komal, S., Bramhecha Amit, R., Chhajed Sneha, S. and Khivsara, B.A., "Android Application using GPS Navigation", Issue of International Journal of Electronics, Communication and Soft Computing Science and Engineering, Berkeley, vol. 5, 2012, pp. 84–89.

[2] Amit Kushwaha and Vineet Kushwaha, "Location Based Services using Android Mobile Operating System", International Journal of Advances in Engineering & Technology, vol. 1, 2011, pp.14-20.

[3] Manav Singhal and Anupam Shukla, "Implementation of Location Based Services in Android using GPS and Web Services" , International Journal of Computer Science Issues, vol. 2, 2012, pp. 237–242.

[4] Juanru Li, Dawu Gu and Yuhao Luo, "Android Malware Forensics; Reconstruction of Malicious Events" , 32nd IEEE International Conference on Distributed Computing Systems Workshops, 2012, pp.552-558.

[5] Ramesh Chandra Gadri, Ankita Chavan, Reema Sonawane and Sujata Kamble, (2012). "Land Vehicle Tracking Application on Android Platform", International Journal of Engineering Research and Applications (IJERA), 2, 3, pp. 1978-1982.

[6] Alexandros Doulamis, Nikos Pelekis and Yannis Theodoridis, (2012). "EasyTracker: An Android Application for Capturing Mobility Behaviour", 16th Panhellenic Conference on Informatics, pp. 357-362.