



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 5, Issue 3)

Available online at: www.ijariit.com

Automation of Movement Register

Anunay Vishnu

anunayvishnu10@gmail.com

Vellore Institute of Technology, Vellore, Tamil Nadu

ABSTRACT

Daily a lot of employees go on a business visit to complete the assigned task or to meet business units. So keeping a record of movement digitally and utilize its data in the form of a dashboard like how many visits conducted BU wise or team wise per month is important. So it is necessary to manage such meetings/visits and it's the outcome for future reference purposes. The large volume of such detection and verification makes Automation of Movement register by capturing Geo Coordinates along date-time is desirable.

Keywords— Geo Location, Android Studio, NoSQL, Tracking, AWS Database

1. INTRODUCTION

Mobile app development is the act or process by which a mobile app is developed for mobile devices, such as personal digital assistants, enterprise digital assistants or mobile phones. These applications can be pre-installed on phones during manufacturing platforms, or delivered as web applications using server-side or client-side processing (e.g., JavaScript) to provide an "application-like" experience within a Web browser. Application software developers also must consider a long array of screen sizes, hardware specifications, and configurations because of intense competition in mobile software and changes within each of the platforms. Mobile app development has been steadily growing, in revenues and jobs created. A 2013 analyst report estimates there are 529,000 direct app economy jobs within the EU 28 members, 60% of which are mobile app developers.

Geolocation is the identification or estimation of the real-world geographic location of an object, such as a radar source, mobile phone, or Internet-connected computer terminal. In its simplest form geolocation, involves the generation of a set of geographic coordinates and is closely related to the use of positioning systems, but its usefulness is enhanced by the use of these coordinates to determine a meaningful location, such as a street address. The word geolocation also refers to the latitude and longitude coordinates of a particular location.

Geolocation provides the location of a device but is generally used in a variety of applications to help locate human users.

Geolocation works through a pre-built GPS in a device that propagates the device's longitudinal and latitudinal coordinates. The coordinates are identified on a map to provide a complete address that usually includes a country, city, town/colony, building name and street address.

Besides GPS, geolocation also may be identified through an Internet Protocol (IP) address, Media Access Control (MAC) address, Radio Frequency (RF) systems, Exchangeable Image File Format (EXIF) data and other wireless positioning systems.

2. RELATED WORK

I read a number of research paper and find the various type of algorithm and approaches that can be used for implementing the concept. And also compared the various method and tried to implement the best one in my system.

In [1], the author focuses on accruing the geolocation through IP address. In this, the author evaluates mapping services using an algorithm that groups IP addresses to Pops, based on structure and delay. This way the author was able to group close to 100,000 IP addresses.

In [2], the author proposes a methodology to explore the impact of location-based personalization on Google Search results. Assessing the relationship between location and personalization, since users' geolocation can be used as a proxy for other demographic traits, like race, income, educational attainment, and political affiliation. In other words, does location-based personalization trap users in Filter Bubbles?

In [3], the author discusses the possibility of overlaying geolocation function in 802.11 DSSS wireless LANs. They used TDOA measuring methods which eliminate the initial synchronization in the conventional method.

In [4], the author uses reverse DNS for accruing IP geolocation. The reverse DNS hostname does not need to be the same as the Forward DNS hostname. While Forward DNS lookup used by Internet users to get to websites, Reverse DNS host-names are typically used to name and describe the underlying physical infrastructure that makes up the Internet. They determined the location at the city level.

3. FUNCTIONAL REQUIREMENTS

Functional requirements are those requirements that describe what software should do, or in another way, we can say that these are those requirements that describe the behaviour and function of the software.

3.1 Login facility

All details about the user will be regulated by this facility, we can authorize the people who have the authority or license to enter

3.2 Check-in phase

All the details about the individual's visit to an organization are allowed to enter like the check-in date and time, the purpose of visit and the organization.

3.3 Database

Connection with the online Database (DynamoDB NoSQL database by Amazon Web Services).

3.4 Check-out phase

All the details about the individual's, while he/she is checking out from the organization, are entered with values like check-out date time, department of visit, remarks and purpose of visit etc.

3.5 Tracking

Geolocation provides the location of a device but is generally used in a variety of applications to help locate human users. Geolocation works through a pre-built GPS in a device that propagates the device's longitudinal and latitudinal coordinates. The coordinates are identified on a map to provide a complete address that usually includes a country, city, town/colony, building name and street address.

4. NON FUNCTIONAL REQUIREMENTS

Unlike the functional requirements, non-functional requirements do not focus on the functions of the system but it elaborates the performance characteristics of the system. These requirements give us a set of characteristics on the basis of which we can judge the efficiency and usability of the system.

4.1 Usability

Simplicity is one of the main characteristics of the Interface and is also very convenient to use. The system is Fool Proof i.e. very convenient and also come with a help guide in case of any inconvenience. The system is usable for all kind of users i.e. for expert, beginner and novice it provides the same satisfaction

4.2 Performance

Speed: All the Operations performed in the Software are of complexity $O(N)$, thus the system is made as fast as possible
 Throughput: By keeping the system minimalistic and dedicating it to only necessary operations will help in achieving maximum output in minimum time.

4.3 Accuracy

Information provided by the user should be accurate or else it will not match with the database. Errors are in downplay. Operation is executed with utmost cautiousness to increase the level of accuracy. External Sources will prove to help achieve higher accuracy

4.4 Security

The software should provide the security for the uses, the password and the username of the user should be safe

5. UML DIAGRAMS

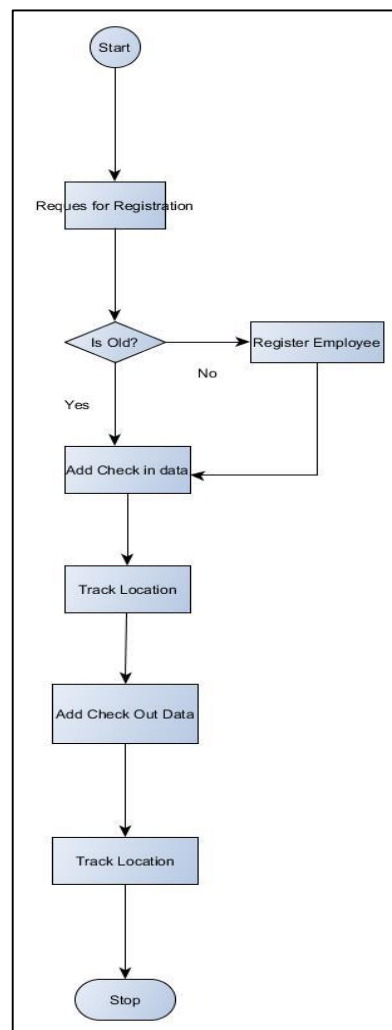


Fig. 1: Activity diagram

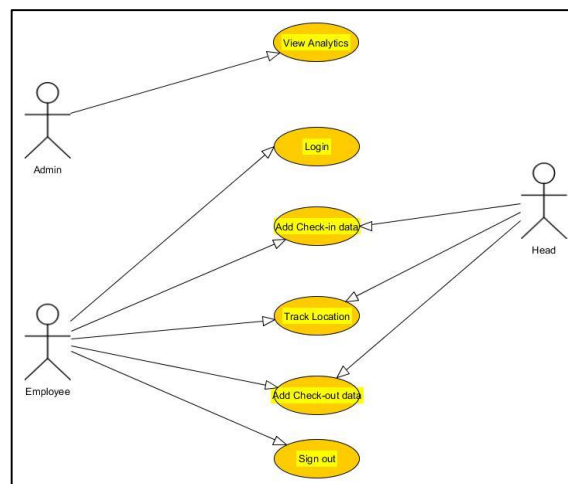


Fig. 2: Use case diagram

6. TECHNOLOGIES USED

The Technologies used in the process of making this application are Android Studio, Advanced JAVA, Database using NoSQL and Geo Location.

6.1 Android studio

Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development

6.2 Advanced JAVA

The whole program is written in Java using an advanced concept like multithreading, JDBC, pipelining etc. The application is purely Java based and only applicable for the android mobile user.

6.3 Database

Connection with the online Database (DynamoDB NoSQL database by Amazon Web Services). NoSQL encompasses a wide variety of different database technologies that were developed in response to the demands presented in building modern applications.

6.4 Geolocation

Geolocation provides the location of a device but is generally used in a variety of applications to help locate human users. Geolocation works through a pre-built GPS in a device that propagates the device's longitudinal and latitudinal coordinates. The coordinates are identified on a map to provide a complete address that usually includes a country, city, town/colony, building name and street address.

7. METHODOLOGY

Daily a lot of employees go on a business visit to complete the assigned task or to meet business units. So keeping a record of movement digitally and utilize its data in the form of dashboard-like how many visits conducted BU wise or team wise per month is important. So it is necessary to manage such meetings/visits and it's the outcome for future reference purposes. The large volume of such detection and verification makes Automation of Movement register by capturing Geo Co-ordinates along date-time is desirable.

An online location tracking application was developed to record the employees visit details and visit outcomes. The app was developed in Java using the android studio.

Internet-facing android application is developed to capture data regarding employee visit such as his/her location, check-in time, and check out time, remarks and visiting department/office. The major steps involved in the development of the application were:

- Getting the latitude and longitude of the employee and converting it to the corresponding address.
- Connection with the online Database (DynamoDb NoSQL database by Amazon Web Services)
- Insert employee visit record in database when he does check in or check out from a remote location.

The app is fully functional and successfully captures the employees' current location using their geo coordinates and saves the data in the AWS database. For login purpose 2 dummy users are created in the database. More users can be added in the database at the production stage. The app also captures other important data like:

- Check-In time
- Place of Visit (Organization's name)
- Check Out time
- Purpose of Visit
- Department
- Remarks

8. GUI

A GUI has been developed for better user experience and interpretation. Screenshots from the GUI for different cases have been shown below.

8.1 Login

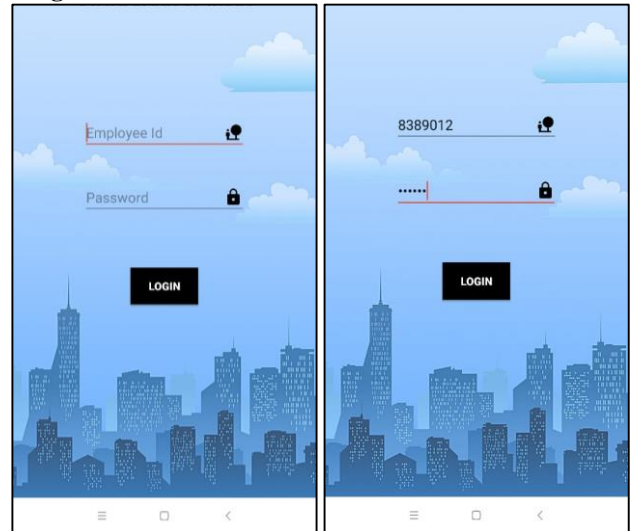


Fig. 3: Login

8.2 Check-in

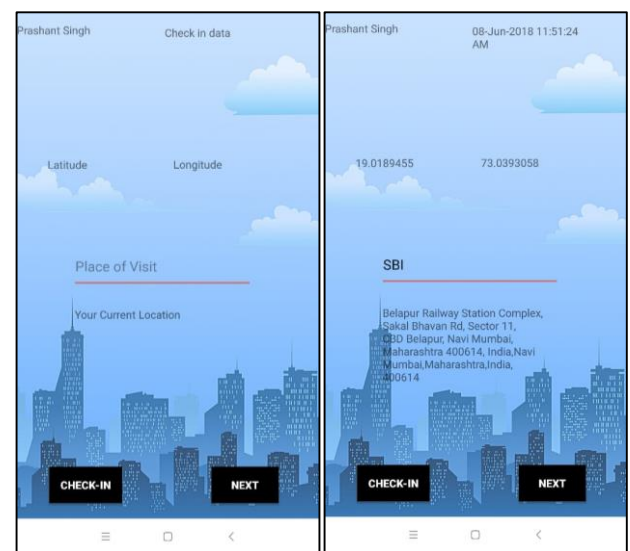


Fig. 4: Check-in

8.3 Check-out

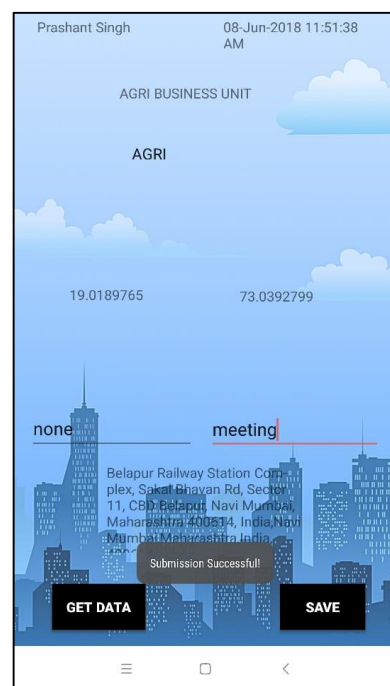


Fig. 5: Check-out

8.4 Database

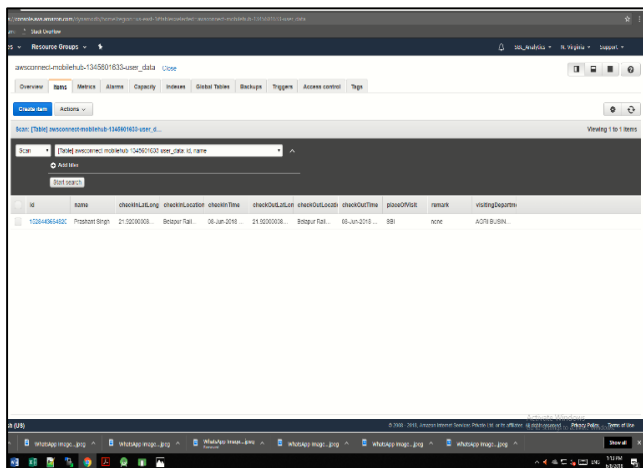


Fig. 6: Database

9. CONCLUSION AND FUTURE EXPANSION

The app is fully functional and successfully captures the employees' current location using their geo coordinates and saves the data in the AWS database. For login purpose 2 dummy users are created in the database. More users can be added in the database at the production stage. The app also captures other important data like:

- Check-In time
- Place of Visit (Organization's name)
- Check Out time
- Purpose of Visit

- Department
- Remarks
- Applicable only for android users.
- Android version 8.0 or above is required.
- For resetting the password, one needs to contact the app developer.

Way Forward:

- In future, a different app can be made for the supervisor which will be linked to this app so that he/she can review it anytime.
- Scope of the current app can be extended for field inspections - Given approach can be further adapted for pre-sanction/post sanction inspection of a fixed asset. At the time of pre-sanction, location of an asset can be recorded through this app only which might be further useful in inspection and asset location tracking.
- Option for resetting the password can be given via app only.
- Modification and enhancement in the current user interface may be required.

10. REFERENCES

[1] Yuval Shavitt, Senior Member, IEEE, and Noa Zilberman
 [2] Chloe Kliman-Silver Brown University chloe@cs.brown.edu
 [3] Xinrong Li Center for Wireless Inf. Network Studies, Worcester Polytech. Inst., MA, USA. Vehicular Technology Conference Fall 2000. IEEE VTS Fall VTC2000. 52nd Vehicular Technology Conference (Cat. No.00CH37152)
 [4] Ovidiu Dan*Lehigh UniversityBethlehem, PA, USAovd209@cse.lehigh.edu