

A Thesis/Project/Dissertation Report
on
Geo-location Mobile Application For Emergency Situations
*Submitted in partial fulfillment of the
requirement for the award of the degree of*
Bachelor of Technology in Computer Science and Engineering



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CANDIDATE'S DECLARATION

We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled **“GEO-LOCATION MOBILE APPLICATION FOR EMERGENCY SITUATIONS”** in partial fulfillment of the requirements for the award of the B.Tech(CSE) submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of July, 2021 to December, 2021, under the supervision of Mr. Vivek Anand, Assistant Professor, Department of Computer Science and Engineering, of School of Computing Science and Engineering , Galgotias University, Greater Noida

The matter presented in the thesis/project/dissertation has not been submitted by me/us for the award of any other degree of this or any other places.

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Supervisor Name

Designation

Acknowledgment

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CERTIFICATE

The Final Thesis/Project/ Dissertation Viva-Voce examination of Anant Prakash Singh:
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Signature of Examiner(s)

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Signature of Project Coordinator

Signature of Dean

Date:

Place: Greater Noida

Abstract

Emergency situations are consistent, unexpected and most likely dangerous to human lives, despite the presence of many technological solutions that are built to help people find necessary resources in times of emergencies, it is a common theme for those resources to go unused or maybe even unrecognized. This problem most frequently occurs because of the lack of knowledge that people have of their surroundings, this lack of awareness and difficulty in finding nearby resources is responsible for the increase in damage from accidents and incidents that lead to loss of human lives at times.

The aim of this paper is to explore the opportunity and possibility to create a mobile phone application for the Android OS platform that gives its users the ability to locate nearby emergency services that range from medical, accidents to other emergencies. Users will be able to open up this mobile application to look for required emergency services. These emergency locations will be updated in real-time using API provided by numerous sources. The development of this application will take place in the Java programming language which is highly suitable for Android OS.

The first part of the project involves Android Application Development of a GPS based Location Tracker in which with the help of any mobile device (app installed); any other GPS enabled handset (app installed) could be located. Though target user may be located anywhere in the world, he must have network connectivity and be GPS enabled. Ideally, the app is developed for Android platform only.

The application which is currently in its systems design phase is expected to create positive results that can assist people in times of peril to find much resources that can result in the reduction of damage created by accidents and incidents.

The resultant application would be able to provide users with useful and much needed information at the tips of their fingers. Such results can bring about significant change and help people live more secure lives.

Keywords—Android, Emergency situations, API, Java programming

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CHAPTER 1

INTRODUCTION

With an evident increase in mobile phone usage in current society, it has become increasingly obvious that the presence of these hand-held gizmos can be used for various effective and useful purposes. It is apparently displaying the hobby of customers in mobile packages that offer storage, evaluation, and visualization of the facts.

Most of the clever telephones ready with computer processing capacity are used to access networks and use exceptional applications evolved to satisfy the consumer requirement through cellular verbal exchange networks. In the ultimate 07 years, one-of-a-kind android cell packages had been evolved such as Pinnacle Paid and Free Apps. Additionally, a few awareness on GPS International Positioning System are advanced.

In various studies papers focus on Android programs until March 2015, different methods are compared as a good way to use GPS for place tracking and routing. Android-based total cell applications named as GPS Smartphone Tracker Seasoned, Mobile Region Tracer, and Vici,y Tracker give Vici,y cope with the user and well-known applications on Google Play. However, those applications have no develop features however, nevertheless more than zero.8 million people downloaded these applications.

Moreover, programs like Discover My Pals, Circle of Relatives Locator, and Own Family Locator & Messaging has also greater than 0.6 million users downloaded records and are used for finding friends and own family region but it has a number of capability court cases from customers, which incorporates system faults and alertness crashing.

Cellular Caller Vici,y Tracker, All Name Place Tracker, and SMS Tracker have extra than zero. Five million downloads and locates best user's Vici,y whose cell phones are connected during the call and short message carrier.

1.1.1 Introduction to problem domain

As we know that in recent times it has become more and possible to leverage technology to make life easier and safer for people. One application of these technological advances is to provide users with the ability to come in contact with

concerned authorities during times of trouble. The solutions present at the moment do not provide users with enough humane solutions to create results that are desirable and effective. The GPS location services available right now do not give users the appropriate options that a user can find usable in an emergency situation, the negative result of these poorly executed technologies is that people end up in grave danger without reliable sources of information that can help people and even end up saving lives.

1.1.2 Aim of the problem

The aim of this problem is to target people stuck in emergency situations and understand their concerns in the given moment and providing them with useful solutions that will help them navigate their way around these situations. Every day and every passing hour a new disaster is striking new people, people are left in emergency situations, where they are baffles, stunned and confused. The need for clear information and necessary information is extremely important. The main purpose of this project is to illustrate the requirements of the project University Management maps System and is intended to help any organization to maintain and manage personal data. It is a comprehensive project developed from the ground up to fulfill the needs of authoritys as they guide their users. This integrated information management system connects daily operations in the authority environment ranging from presence management to communication means among users and facultys. This reduces data error and ensures that information is always up to-date throughout the authority. It provides a single source of data repository for streamlining your processes and for all reporting purposes. It has a simple user interface and is intuitive. This ensures that the users spend less time in learning the system and hence, increase their productivity. Efficient security features provide data privacy and hence, increase their productivity.

1.1.3 Emergency resources

There are a plethora of emergency resources that can be provided to a user, these resources must be divided into several categories and presented in a manner that is understandable to the user. We can take into account these several services and package them together into three categories, namely medical resources, law enforcement resources and fire safety related resources. Although not the most apparent in terms of division, these services can prove to be extremely useful and once a user has opened up said application in a time of emergency, they can easily find their way around and access these resources. The GPS location services available right now do not give users the appropriate options that a user can find usable in an emergency situation, the negative result of these poorly executed

technologies is that people end up in grave danger without reliable sources of information that can help people and even end up saving lives.

1.2 Problem Formulation

1.2.1 Tools and Technology Used

Eclipse IDE & ADT setup

Eclipse is an integrated development environment for multi-language software & web application development. Its extensible plug-in system helps in customizing the IDE to work on a particular technology, like Android in this case. It supports Java as the principal coding language and through plug-ins; it supports C, C++, Python, Ruby, PHP, JavaScript, Perl etc. Under Eclipse Public License, the SDK is free and open source. For android application development, we need to download the Android Development Tools (ADT) plug-in for eclipse and install it. After this, we need to run the SDK manager so as to download the Android SDKs for developing onto newer android OS versions and also the Google APIs and other support functions so as to use Google licensed android services like Maps, OAUTH 2.0 etc to full use. The eclipse configuration where I have developed the applications is as follows:

Eclipse

:

Version

Juno (4.2.1)

ADT Package

Oracle ADF

Oracle is a Java server software. Any java server is either hardware (a computer) or software (the computer application) and thus it helps deliver content which is accessed through the computer. It is the back end that provides the support for scripts to work, databases to seamlessly integrate with the web application. Apache played a vital role in initial phases of development of World Wide Web. It helps in implementing core modules for handling server side programming language, authentication schemes, socket transactions & layer securities. While supporting ftp, it has inbuilt SQL authorizing tool & inbuilt search engine. The large public library of add-ons helps one to customize the server end. Wamp Server is used to run a local server on PC or laptop.

Python Scripting

It serves as a server side scripting language. The interpreter used at server end is a dedicated PHP processor module and interprets the chunk of code within the delimiters. Acronym for Hypertext Preprocessor, PHP helps in designing dynamic web content. PHP code is processed in command-line mode performing desired operating system operations and producing program output on its standard output channel. The three main reasons to work with PHP are: first, it fits in greatly with SQL, being interchangeable with it, and only adds new content. Secondly, its user interface provides a richer experience as compared to SQL only. Third and foremost, it's easy to learn and we can easily get started by using only a few functions.

MySQL Database

MySQL is a world renowned open source Relational DBMS supporting standard SQL. At the server end, it can be configured to provide single user or multi user access to a number of databases and tables. Some of the best features are: cross-platform support, updatable views, cursors, information schema, query caching etc. It can easily be integrated into PHP scripts. It is developed, distributed & supported by Oracle foundation.

Summary

In this chapter, the various technologies which have been used to manage & develop the applications have been discussed. Support for both localhost and remote server has been discussed. They are instrumental in making the applications stand up to their quality while seamlessly implementing the work flow.

1.2.2 What is the purpose of this project?

The current GPS emergency information providing applications may result in user end confusion and hence result in a situation where a readily available resource was not utilized and hence wasted. The purpose of this project is to refactor present solutions and make more a far more effective application that solves these problems.

1.2.3 Why do we need GPS assistance?

GPS systems are marvels of technological advancements, their usages are extremely wide spaced and can be seen in several industries. Some of them are mentioned below. The accuracy of the GPS receivers used for standard handheld receivers is usually within 5 meters. However, the most advanced and costly GPS receivers offer precise positions up to $\pm 1\text{cm}$, mostly used for many different activities.

IN THE FIELD OF AVIATION: GPS plays a central role in the smooth functioning of the aviation industry. GPS not only provides control centers with the location of an aircraft but also provides a host of other information which allows control centers to create an informed panel that can ensure that these air-crafts do not end up crashing with each other and result in an accident.

OFF-SHORE OPERATIONS: Ships that are deep into the ocean and ships that are close to the coast use the GPS alike, in fact the naval industry may use the most accurate GPS of them all. These highly accurate GPS allow these ships to steer clear of unknown waters and other nearby ships. Along with that, these ships also use the GPS to calculate and route the shortest and easiest path in order to be more time and cost efficient.

HORTICULTURE: Yes, seeds are not replanted in the same places and helps to return to the same place in the field for future planting. It also helps farmers to keep farming under conditions that they are absolutely unaware of, these kind of conditions are created because of weather conditions such as fog and darkness machine is guided by its GPS location rather than visible indicators. Additionally, mapping of land samples that allow cultivators to find and use the most fertile area was done by the application of global positioning systems.

APPLICATIONS IN THE FIELD OF SCIENTIFIC STUDY: GPS are used by researchers for a wide range of purposes, from analysis of land for geographical purposes to the scavenging of forest areas for botanical surveys, the use of GPS is extensive and apparent from distance. Many scientists use the GPS to know the whereabouts of animals that are low in population as well as to keep track of flora through the seasons. The research on the physical features of the earth such as terrains that constitute of mountains and mountain ranges allows scientists to conduct extensive research.

PEACE MAKING STRATEGIES: The GPS gadget was developed through the U,ed States department of Defence to be used by way of U,ed States troops however become later made available for public use in the following years. The

global positioning system is now very crucial to the army of the United States of America. Multiple countries around the globe which include China and India are launching their GPS observatories in order to gain strategic advantage over their competitors. Systems permit infantrymen to tune their troops, machines and other essential military technologies. And moreover, GPS is also crucial for aerial attack technologies to provide army officers with mooring and route in a variety of every day guidelines and in all weather situations. International locations like the United States of America additionally use excessive-precision GPS to map and arrange their worldwide format in a distinctly worthwhile approach.

STOCKS AND EQUITY TRANSACTIONS: The global positioning system is bound to boom and gain advantages of nearly 11% every year for the next few years according to forecast, the GPS technology has resulted in noticeable advancements their performance in many industries and new systems are being developed because of their significant benefits.

1.2.4 Problems with current GPS assistance

The current GPS assistance application have several problems in terms of their ability to understand the problem and provide with contextually relevant solutions that the user can find useful. When users are present in an emergency situation they do not want to get indulged with a number of features and services, the aim of users in such conditions is to get to a solution as quickly as possible and find a way out of the current emergency situation.

Current GPS systems provide users with a huge number of features that are frankly of no use to the user and even create distractions for them.

1.2.5 Who will benefit from this application?

Frankly speaking, anyone who can ever get into a situation of emergency can find use to such a piece of technology. From a university user to an old person living alone. Essentially anyone can find use from this application, all they have to do is open this application and find phone numbers, locations and other information related to their emergency situation in a matter of seconds.

With a large scope of users it becomes increasingly necessary to understand that this application has a universal application as long as the user happens to have sufficient internet and handheld technology.

CHAPTER 2

Literature Survey

2.1 Literature Survey

After analyzing the requirements of the task to be performed, the next step is to analyze the problem and understand its context. The first activity in the phase is studying the existing system and other is to understand the requirements and domain of the new system. Both the activities are equally important, but the first activity serves as a basis of giving the functional specifications and then successful design of the proposed system. Understanding the properties and requirements of a new system is more difficult and requires creative thinking and understanding of existing running system is also difficult, improper understanding of present system can lead diversion from solution.

2.1.1 Analysis Model

The model that is basically being followed is the WATER FALL MODEL, which states that the phases are organized in a linear order. First of all, the feasibility study is done. Once that part is over the requirement analysis and project planning begins. The design starts after the requirement analysis is complete and the coding begins after the design is complete. Once the programming is completed, the testing is done. In this model the sequence of activities performed in a software development project are:

- Requirement Analysis
- Project Planning
- System design
- Detail design
- Coding
- U, testing
- System integration & testing

Here the linear ordering of these activities is critical. End of the phase and the output of one phase is the input of another phase. The output of each phase is to be consistent with the overall requirement of the system. Some of the qualities of spiral model are also incorporated like after the people concerned with the project review completion of each of the phase the work done. WATER FALL MODEL was being chosen because all requirements were known beforehand and the objective of our software development is the computerization/automation of an already existing manual working system.

2.1.2 Feasibility Study

Preliminary investigation examine project feasibility, the likelihood the system will be useful to the organization. The main objective of the feasibility study is to test the Technical, Operational and Economical feasibility for adding new modules and debugging old running system. All system is feasible if they are unlimited resources and infinite time. There are aspects in the feasibility study portion of the preliminary investigation:

2.1.3 Technical Feasibility

Technical Feasibility centers on the existing computer system hardware, software, etc. and to some extent how it can support the proposed addition. This involves financial considerations to accommodate technical enhancements. Technical support is also a reason for the success of the project. The techniques needed for the system should be available and it must be reasonable to use. Technical Feasibility is mainly concerned with the study of function, performance, and constraints that may affect the ability to achieve the system. By conducting an efficient technical feasibility, we need to ensure that the project works to solve the existing problem area.

Since the project is designed with SQL with .jar and JS as Front end and ECLIPSE IDE as Back end, it is easy to install in all the systems wherever needed. It is more efficient, easy and user-friendly to understand by almost everyone. Huge amount of data can be handled efficiently using ECLIPSE IDE as back end. Hence this project has good technical feasibility.

2.1.4 Operational Feasibility

People are inherently resistant to change and computers have been known to facilitate change. An estimate should be made to how strong a reaction the user staff is likely to have towards the development of the computerized system. The staff is accustomed to computerized systems. These kinds of systems are becoming more and more common day by day for evaluation of the software engineers. Hence, this system is operationally feasible. As this system is technically, economically and operationally feasible, this system is judged feasible.

Economic Feasibility

The role of interface design is to reconcile the differences that prevail among the software engineer's design model, the designed system meet the end user requirement with economical way at minimal cost within the affordable price by encouraging more of proposed system. Economic feasibility is concerned with

comparing the development cost with the income/benefit derived from the developed system. In this we need to derive how this project will help the management to take effective decisions. Economic Feasibility is mainly concerned with the cost incurred in the implementation of the software. Since this project is developed using more commonly available and even the cost involved in the installation process is not high. Even if we want to train the persons in this area the cost involved in training is also very less. Hence this project has good economic feasibility. The system once developed must be used efficiently. Otherwise, there is no meaning for developing the system. For this a careful study of the existing system and its drawbacks are needed. The user should be able to distinguish the existing one and proposed one, so that one must be able to appreciate the characteristics of the proposed system, the manual one is not highly reliable and also is considerably fast. The proposed system is efficient, reliable and also quickly responding.

Architecture

Various Design concepts and processes were applied to this project. Following concepts like separation of concerns, the software is divided into individual modules that are functionally independent and incorporates information hiding. The software is divided into 3 modules which are users, faculties and administrators. We shall look at each module in detail.

User location

Each user belongs to a map identified by semester and section. Each map belongs to a department and are assigned a set of courses. Therefore, these courses are common to all users of that map. The users are given a unique username and password to login. Each of them will have a different view. These views are described below.

- **Authority location** Each user can view only their own personal information. This includes their personal details like name, phone no, address etc. Also, they can view the courses they are enrolled in and the presence, marks of each of those.

- **Service information**

presence for each course will be displayed. This includes the number of attended mapes and the presence percentage. If the presence percentage if below a specified threshold, say 75%, It will be marked in red otherwise it be in green. There will also be a day wise presence view for each course which shows the date and status. This will be presented in a calendar format.

- **Notifications and events**

This section is common to all users. Notification are messages from the admin such as declaration of holidays, test time-table etc. The events and their details are specified here. Each faculty belongs to a department and are assigned to maps with a course. faculties will also have a username and password to login. The different views for faculties are described below.

- **Information**

The faculties will have access to information regarding the courses and maps they are assigned to. Details of the courses include the credits, the syllabus plan. Details of the map include the department, semester, section and the list of users in each map. The faculty will also have access to information of users who belong to the same map as the faculty.

- **Availability**

The faculty has the ability to add and also edit the presence of each user. For entering the presence, they will be given the list of users in each map and they can enter the presence of the whole map on a day-to-day basis. There will be two radio buttons next to each user name, one for present and the other for absent. There will also be an option for extra maps. faculties can edit the presence of each user either for each user individually or for The whole map.

- **User history**

The faculty can enter the marks for the 5 events and 1 SEE for each course they are assigned. They also have the ability to edit the marks in case of any changes. Reports such as the report card including all the marks and CGPA of a user can be generated.

Administrator

The administrator will have access to all the information in the different tables in the database. They will access to all the tables in a list form. They will be able to add an entry in any table and also edit them. The design of the view for the admin will provide a modular interface so that querying the tables will be optimized. They will be provided with search and filter features so that they can access data efficiently.

Location data

The map diagram states the different maps involved in the software. For each map, a set of attributes and method are included. The relationship between the maps is also specified. For example, the faculty map has the attributes Id, name, phone no, address and methods such as marking presence, declaring marks and preparing report cards. Each instance of the faculty map belongs to a department. This is specified by the relationship between faculty and Department maps. map diagram of authority maps

Architectural design

The maps software requires the architectural design to represent the design of the software. Here we define a collection of hardware and software components and their interfaces to establish the framework for the development of this software. There exists number of components of the system which are integrated to form a system. The set of connectors will help in coordination, communication, and cooperation between the components. The maps software is built for computer-based system. It exhibits the data-centric style of architecture.

Architectural style

In the authority maps software, the database stores the data of all the users and faculties and the stored data is updated, added, deleted or modified. So, it exhibits the data-centric architectural style.

In this architecture different components communicate with the shared data repository. The components access a shared data structure and are relatively independent. The components are Data-Centric architectural style.

• Central Data

Also known as data store or data repository, which is responsible for providing permanent data storage. It represents the current state. It stores the information of users, presence of users and faculties of each day.

• Data Accessors

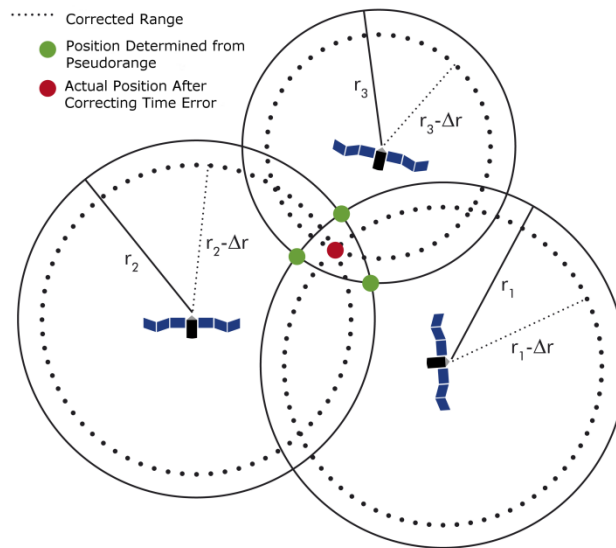
Data accessors one of the components, they are also called as clients. A data accessor operates on the central data store, perform computations, and might put back the results. Which includes users, faculties and administrator. users requests to access the data from the repository and gets the request serviced. Faculty members modify the data in the repository. Administrator can add or delete the clients.

• Interface

Interface is the connecting component between data repository and clients' client interact with the data through the web server. The operation of one client does not depend on the others. They are independent of each other. This data-centered architecture will promote integrability. This means that the existing components can be changed and new client components can be added to the architecture without the permission or concern of other clients. Addition of removal of users and faculties can be done without the permission of other users and faculties.

2.2 GPS MODULE STUDY

Turning ON the GPS module on the phone would not cost us anything but getting a location usually involves transaction with cell phone service provider so as to extract the location fast and with as little network connectivity as possible plus non visibility of satellites. In short: no cell phone service implies any GPS location, as far as handheld devices are considered.



Normal GPS

The method is called trilateration. The receiver listens to a particular frequency and gets data packets in the form of time coded messages from satellites. The receiver figures which satellites it can hear from. It starts gathering those messages containing time information from atomic clocks, current satellite positions etc. Nominal time to get a location is around 30-60 seconds. The same information needs to be confirmed by at least two other satellites. Only Using Mobile Services The user location in an area is calculated with the help of signal measurements with the information received from cell towers. Information analyzed are angle to approach towers, multipath fading characteristics with signal strength comparisons. No GPS module used.

Assisted GPS

This is what a cell phone normally uses for mapping and GPS use purposes. User location information is retrieved within 5-10 seconds. The GPS components are shared with other mobile components and hence simultaneous use of GPS and normal voice/video usage is done. First, gross positioning information from service

provider based on what cell tower is being accessed and the same is fed to the GPS receiver. Next, the phone switches from phone to GPS mode for around 0.1 seconds and collects raw GPS data from satellites. It then switches back to phone mode and sends the data to the service provider to be analyzed.

GPS Based Location Tracker

The service provider uses its servers to process the data and send the most accurate location back to the phone to be displayed on a map overlay.

Full Chip GPS Receiver

The module still gets data from the service provider such as tower positioning and satellites to hear from. Switching is for 1 second but after that the receiver keeps track of information with very low power drawn from circuit.

2.2.1 Software Modules Used

Software modules being used in Android application can be better described in form of different activities used. An Activity is a library entity which describes the response of a layout to the user behaviour i.e. serves as an interface. The behaviour or activity is defined through a class file and an associated layout. Multiple activities have been use here so as to handle different functional requirements:

a. **AboutApp.java** Show welcome information to the user. Next is authentication screen.

b. **AuthenticateUser.java** For first time user, it first registers the user onto the device database. Once registered, for normal user, it checks login ID and password and authenticates the same against those stored internally. On proper authentication, the user is taken to the application menu.

c. CustomPin.java

Describes the behaviour of the pin point which would be used to point to any arbitrary location user touches on the screen I,ializes the pin point image as a Green pointer with 'G' inscribed. Any pinpoint would be added as a overlay on the main MapView.

d. FrendPin.java

Describes the behaviour of the pin point which would be used to point to the user whose location was retrieved from the server I,ializes the pin point image as a Brown pointer with 'U' inscribed.

e. **HomePin.java**

Describes the behaviour of the pin point which would be used to point to the device location or own location on the MapView. It initializes the pin point image as a Blue pointer with 'A' inscribed. Any pinpoint would be added as an overlay on the main MapView.

f. **JSONParser.java**

Important class used to define the behaviour of the entity which would handle the transaction with the remote server using network connection. Data is formatted as *Java Script Object Notation (JSON)* objects. The method *getServerResponse(url , method , params)* returns a JSON object. If the method is "POST", then an Http Client is used to simply send instructions or data contained in "params" to the remote server designated by "url". The response received contains no appreciable data apart from success or failure execution information when this connection method is used. If the method is "GET", then an Http Client is used to simply send information contained in "params" to the remote server designated by "url" and the response is received from the server containing required data when this connection method is used. The response received is built to strings and encoded into JSON format to be parsed later by other objects so as to retrieve information.

g. **MapsMain.java** initializes the *MapView* which is the primary view being used in our application. The *MapView* implements the Google APIs for maps. It implements toggling between *Street View* & *Satellite View* for Maps. It implements addition of compass, controller to animate to location and zoom in/out & extraction of the best *Criteria* for selection of *Provider*. It initializes home location and recurring refreshing of the same. It implements extraction of the address from the particular coordinates and can place a pinpoint at that particular position & removal of all pin points. It implements *AsyncTasks* for (execution on a separate thread so as not to overload the main thread) getting the JSON encoded location of user through his/her UID, to create the user in the remote database if the app is being used for the first time & to delete the same user data in the remote database.

h. **Menu.java**

Gateway to different activities, each managing *MapView*, our preferences, broadcasting of our location.

i. **ServiceSetup.java** (*R.layout.updateddiag*)

Implements the layout for using the service interface. Wherein we can explicitly start or stop broadcast of our location to the remote location. It sets up the objects of *UpdateService* Class.

j. **Splash.java** (*R.layout.splash*)

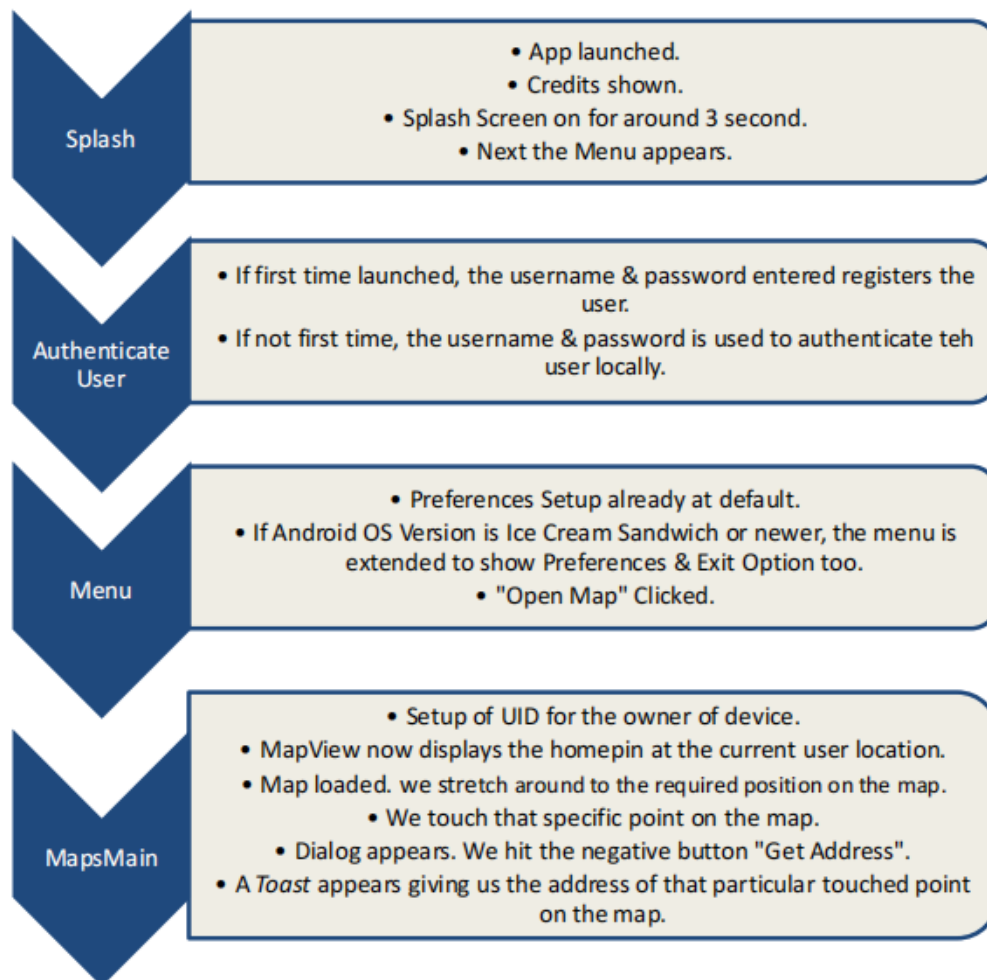
Implements the first screen when the app is launched showing app name and credits

k. **UpdateService.java**

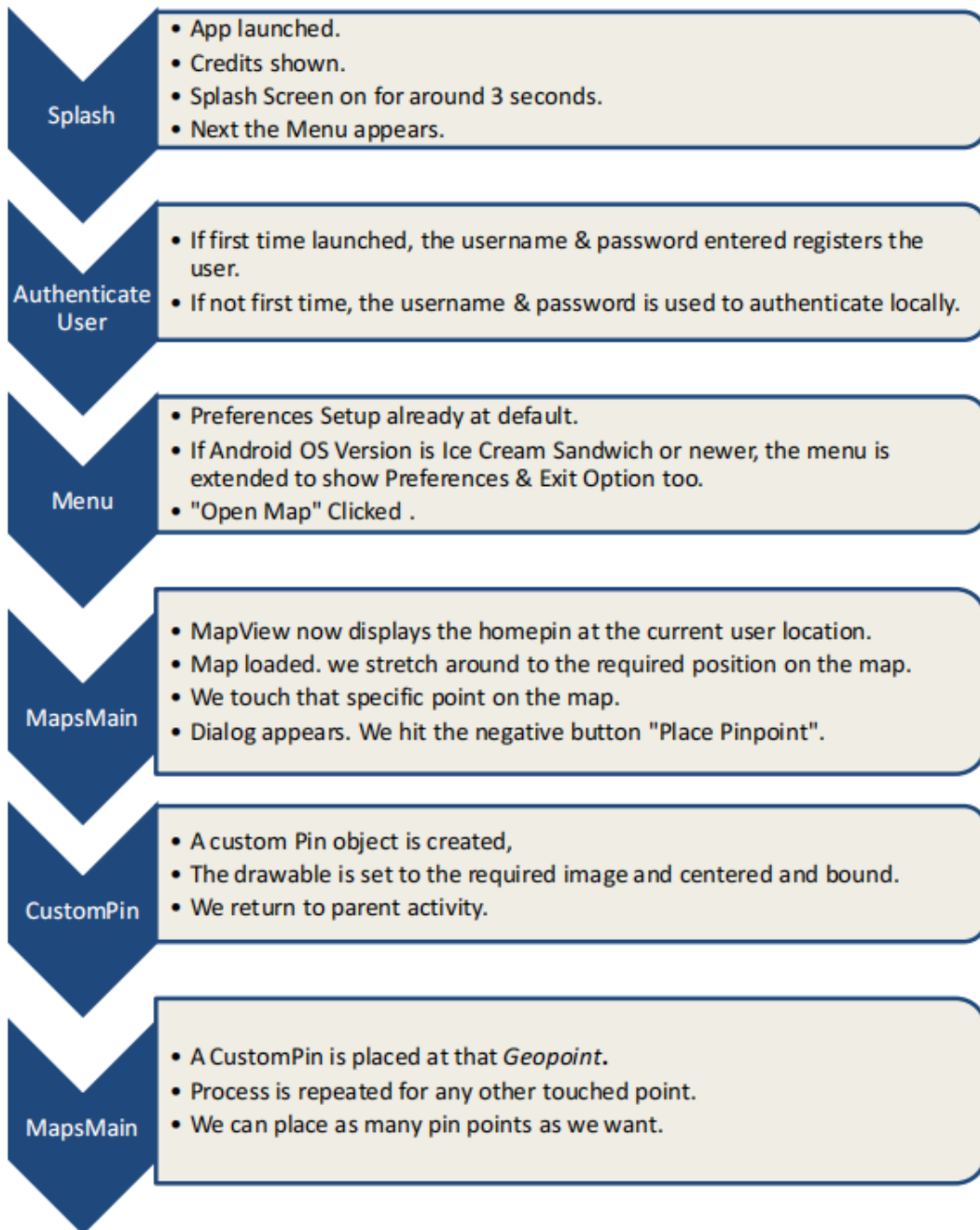
Implements a background service which periodically refreshes our location in the remote database against our UID

2.2.3 Workflow Sequences

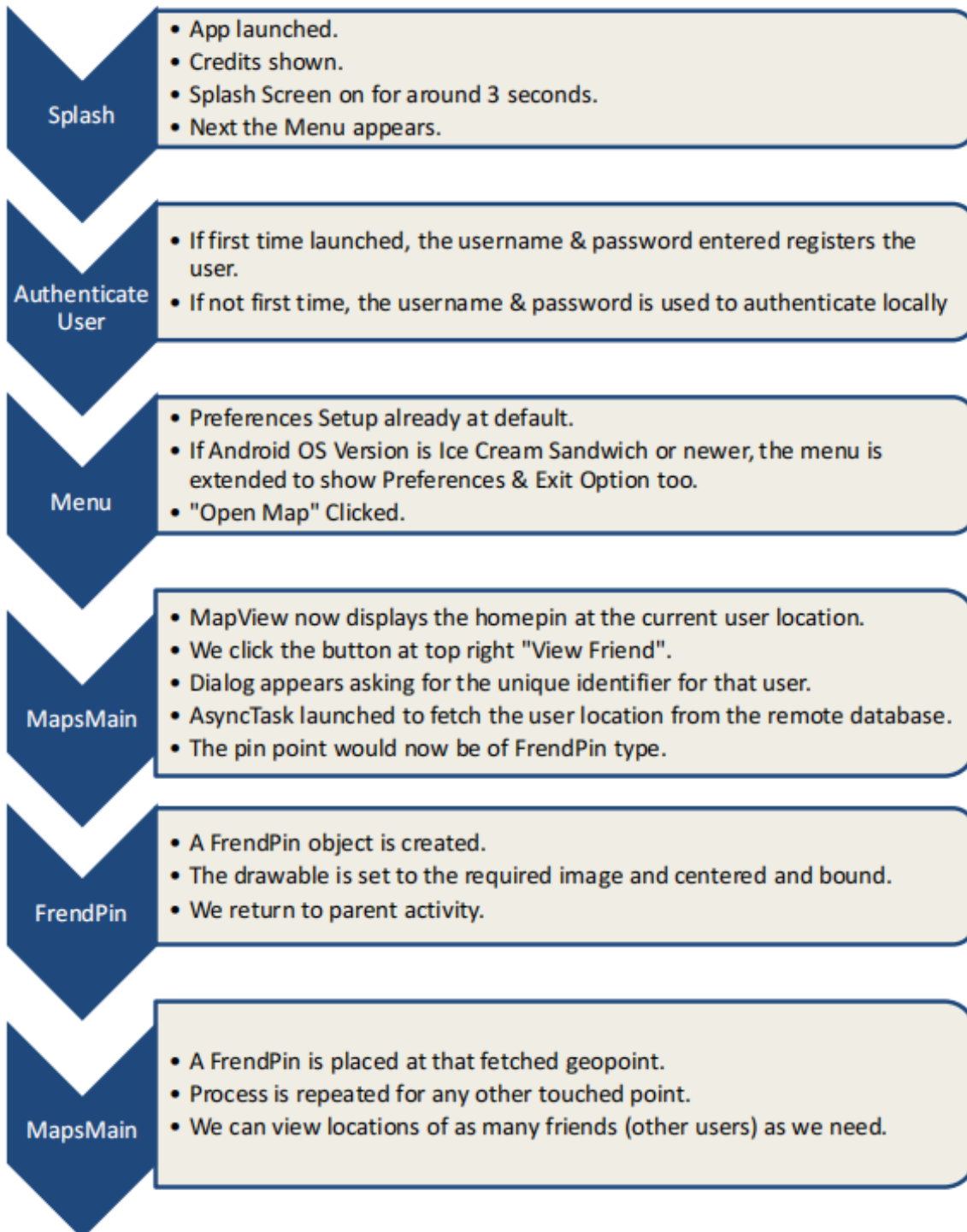
To Extract Address from a touched point on the MapView, we must touch the screen for more than 2.5 seconds leading to generation of the dialog. We hit the button "Get Address" & the view finds the x & y coordinates on the screen & correlates it with that of the map. The view connects to the server giving it the lat& long for that point & hence, displays address.



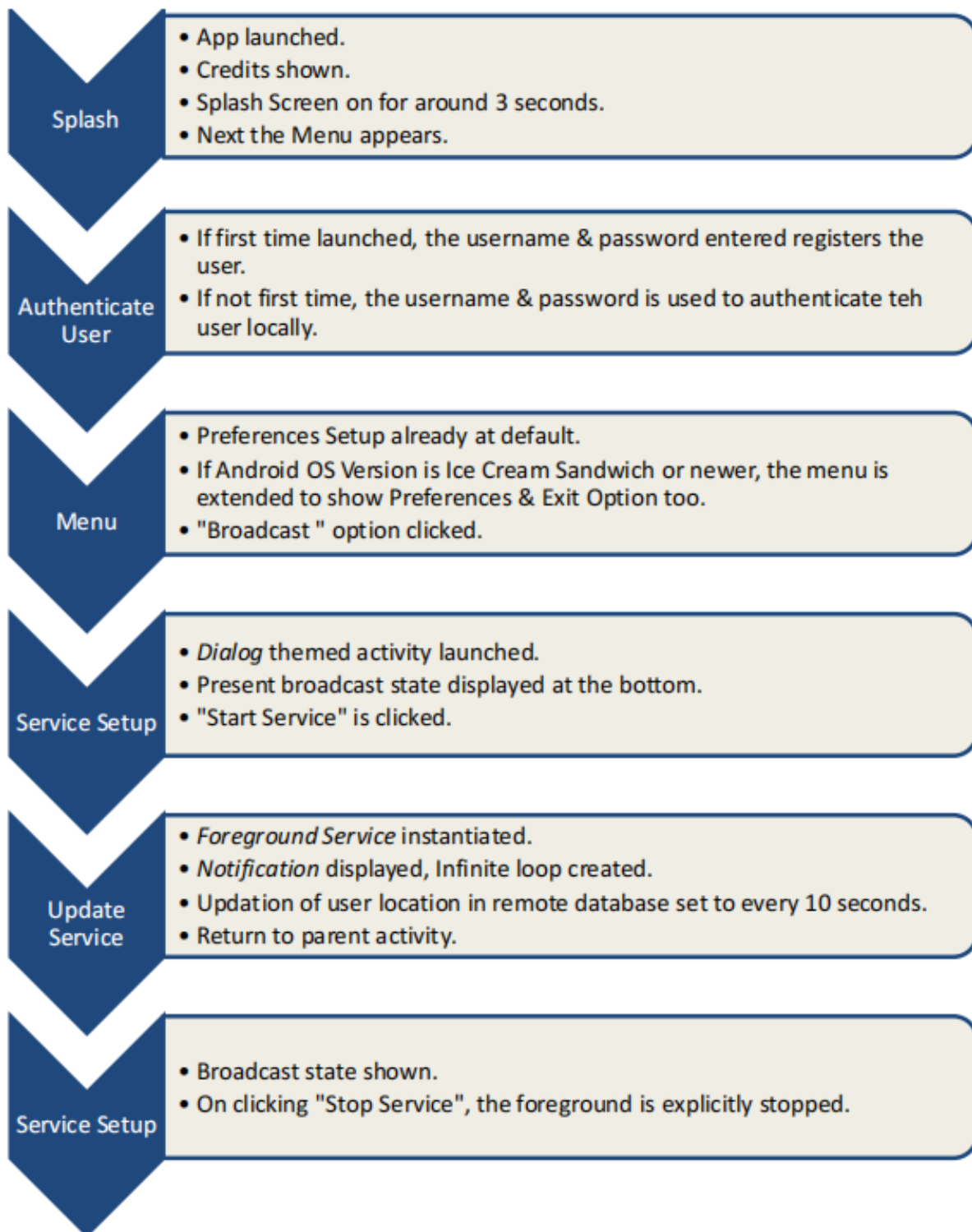
To place a pinpoint on the MapView, we follow the same procedures as to the point of displaying of dialog, and then we hit the button “Place PinPoint”.



To locate another user on the MapView, we hit the button “Find Friend” on top-right, the dialog asks for UID of the person, the location is to be fetched from the remote database.



To enable broadcast of our location, we launch the same from Menu, and then start the service to periodically send our location to be stored in the remote database.



Data Transaction Module Analysis

For any data transaction over the network arising in both the applications we have developed, we have used *AsyncTask* Class type objects. The sole reason for this is not to overload the main thread. Whenever an *AsyncTask* object is created, the execution of its behavior is done in a separate UI thread. Then, we need to add the following unimplemented methods:

a. *onPreExecute()*

Throughout our applications, we have displayed a progress dialog here. The dialog shows a message while the execution of *doInBackground()* is complete.

b. *doInBackground()*

A new thread is created, data to be sent to the server is added as a *NameValuePair* object encoded in a list. Using an object of *JSONParser* Class, the *getServerResponse()* is called, with three arguments being supplied: the URL, method type & the parameters to be sent.

getServerResponse() method returns a *JSONObject*.

The object is then parsed to get information about:

□

Successful Execution of script on server, Error message, if any, Data such as user list, subject list etc.

c. *onPostExecute()*

The execution is about to end.

Progress dialog is closed.

Result implemented, if needed.

JSONParser Class

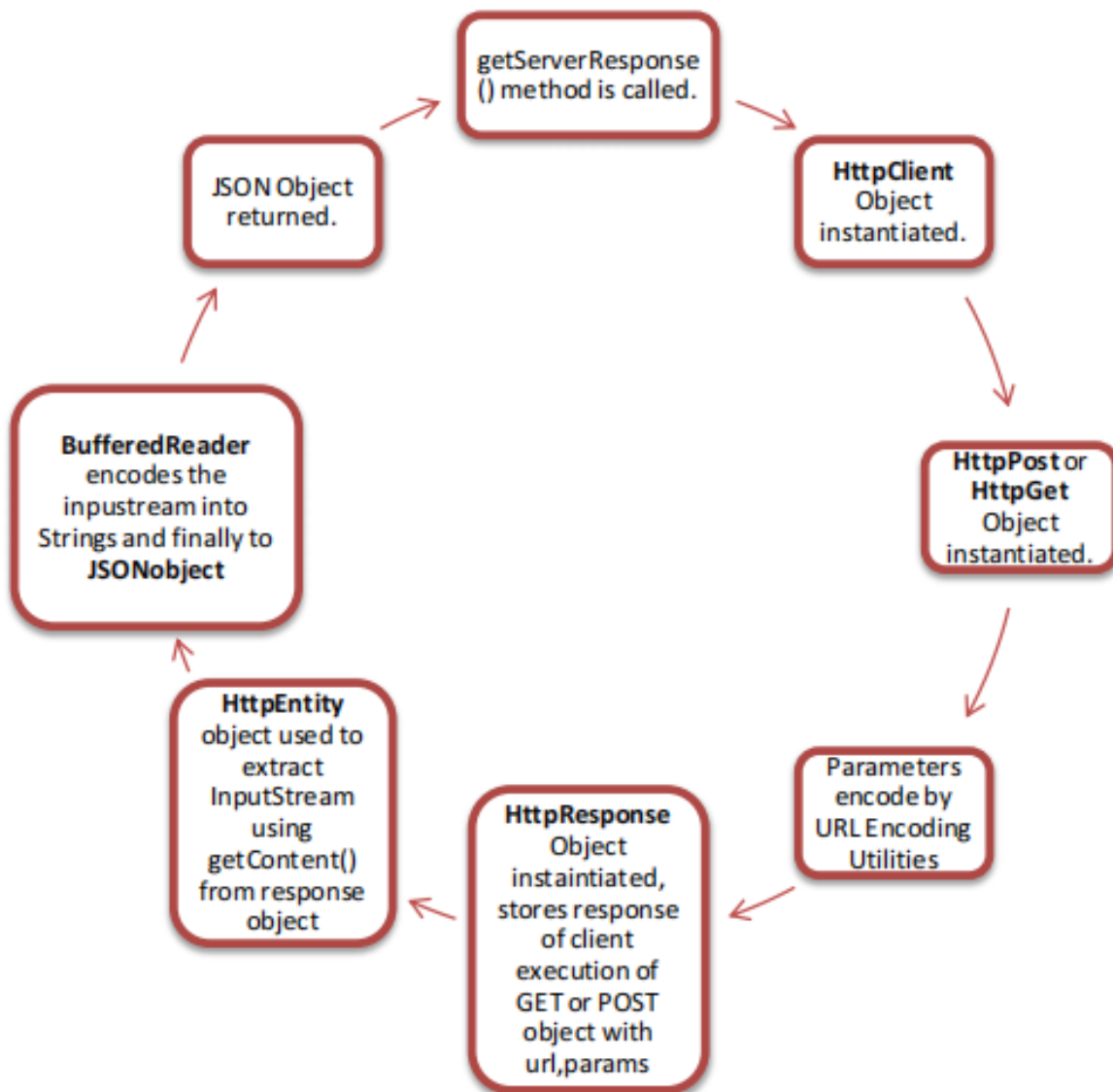
Very briefly, it defines the method *getServerResponse()*.

There are two method types: “GET” or “POST”.

HttpClient is instantiated.

If “GET” method type is selected, the user is trying to get some viable data back from the remote server and as parameters, it is sending some data in params. The query is encoded in an *HttpGet* type object.

If “POST” method type is selected, the user is just trying to send some viable data to the remote server and as parameters, it is sending some data in params. The query is encoded in an *HttpPost* type object. The response of the client’s execution of this object is stored in an *HttpResponse* type object. Response thus received is parsed into entities. The content received is extracted from the response object through the *getContent()* method executed on the response by an *HttpEntity* object. The content is an *inputstream*. And using *BufferedReader*, the content received, thus, is translated into Strings. The strings are finally encoded into a JSON object.



SQLite DBMS Module Analysis

In our application dealing with availability management, we did deal with the use of database. But actually the DBMS compatible with android is *SQLite* contained in a small programming library of around 350 KB. It supports most of the standard SQL using a dynamically but weakly typed SQL syntax. It is hence a popular storage medium for use as embedded database. In case of android, to access any *SQLite* database we need a handler, an object of a class extending *SQLiteOpenHelper*. The following methods are added & defined in the class:

a. Constructor

Just calls the super function.

b. *onCreate()*

The method is called when the handler is instantiated the first time ever for the application. It's better to move the Table Creation instructions out of the *onCreate()*

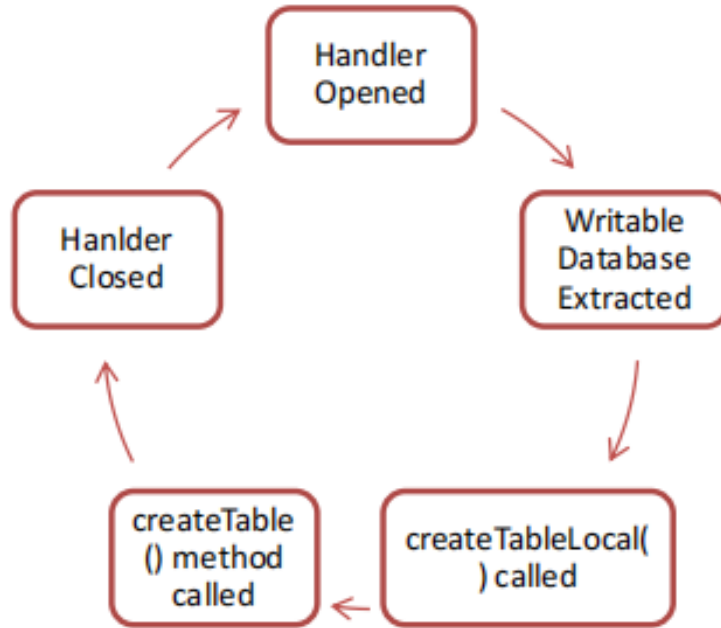
c. *onUpgrade()*

drops the table if created and re-calls the *onCreate()*

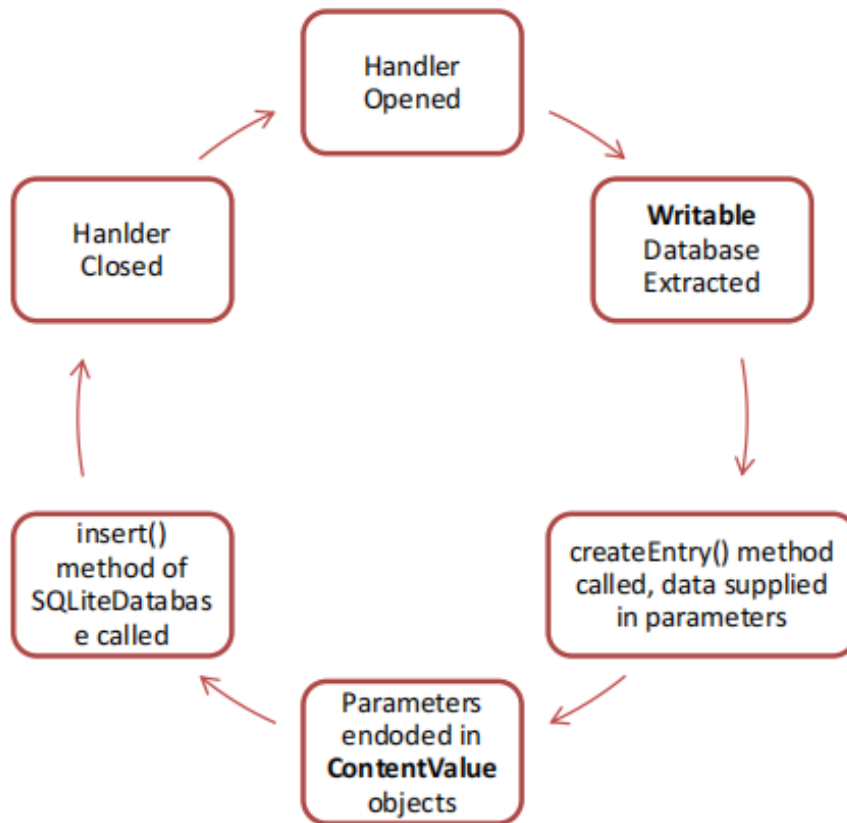
d. *createTable()*

Not a library method, it's a custom user defined method wherein a database object executes a *CREATE* instruction. Apart from the above, the following need to be noted: For any transaction of data to or from the database or any of its tables, the handler must be opened i.e., the context should be assigned and a writable database should be extracted using *getWritableDatabase()* method. The class should have a method which should call the *createTable()* method of the helper. After all transactions and querying are complete, the database handler must be dereferenced or closed.

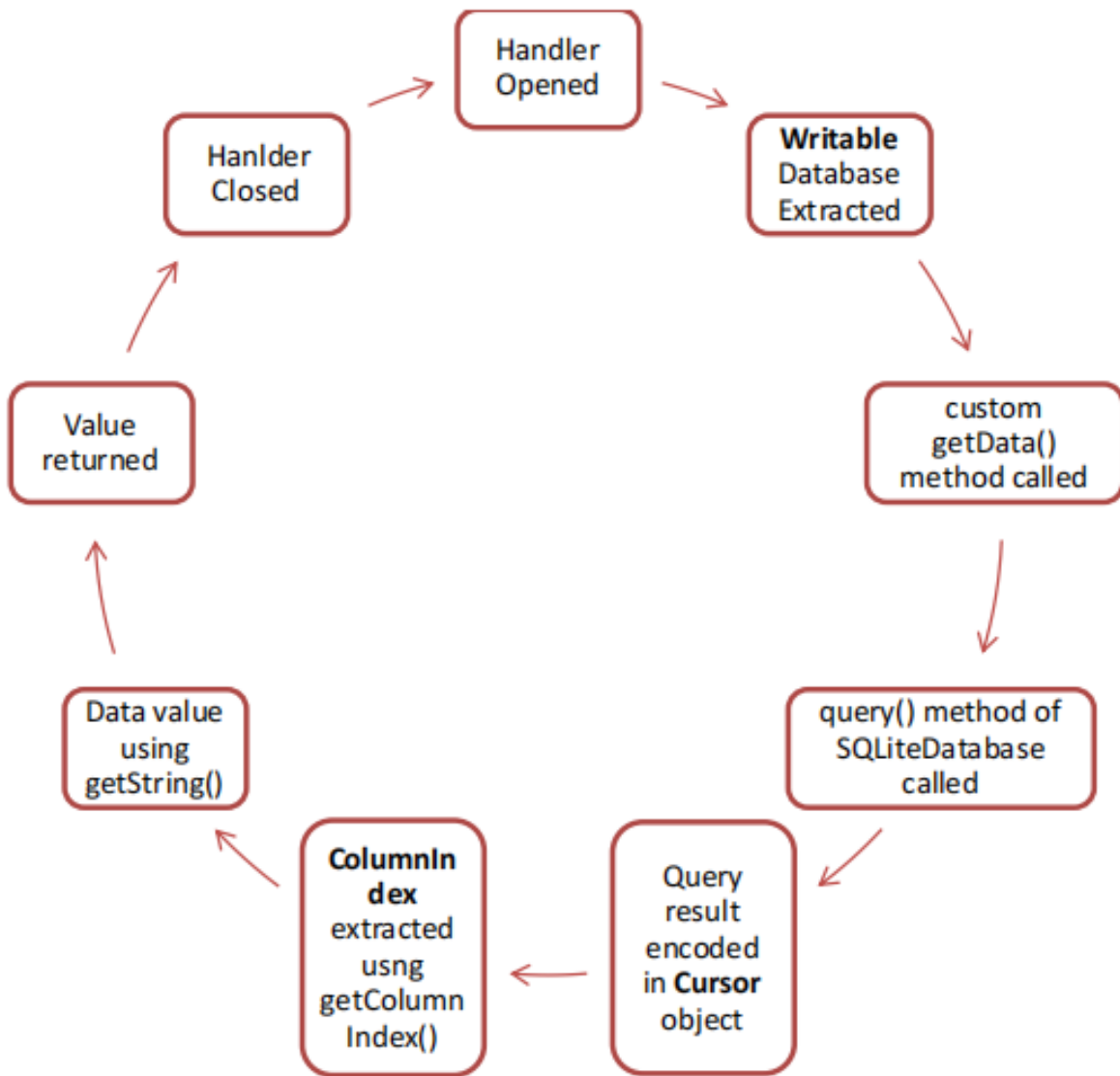
For creation of rows or entry of data, values are encoded in *ContentValue* type entities. Any query instruction returns bundled data embedded in a *Cursor* type entity.. First, the column indexes are extracted using *getColumnIndex()* method and then using *getString()* method, the corresponding values are extracted. Any SQL statement can be executed using *execSQL()* method.



Creation of Table in SQLite Database in Android



Data Entry into Table in SQLite Database in Android



Data Query from Table in SQLite Database in Android


CHAPTER 3

UI DESIGN PROTOTYPE SCREENSHOTS

Loading Screen Page



LOGIN PAGE FOR FIRST TIME INSTALLERS



Sign up




USERNAME

EMAIL

PASSWORD

Sign up

or sign up with:

By signing up you are agreeing to our terms and conditions

PREVIOUS USER LOGIN



Sign in

USERNAME

PASSWORD

Login

or sign in with:



[Don't have an account?](#)

[Forgot password](#)

SELECTING RELEVANT HELP

Medical Assistance

Kaushambi	Indirapuram	Anand V
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Law Enforcement

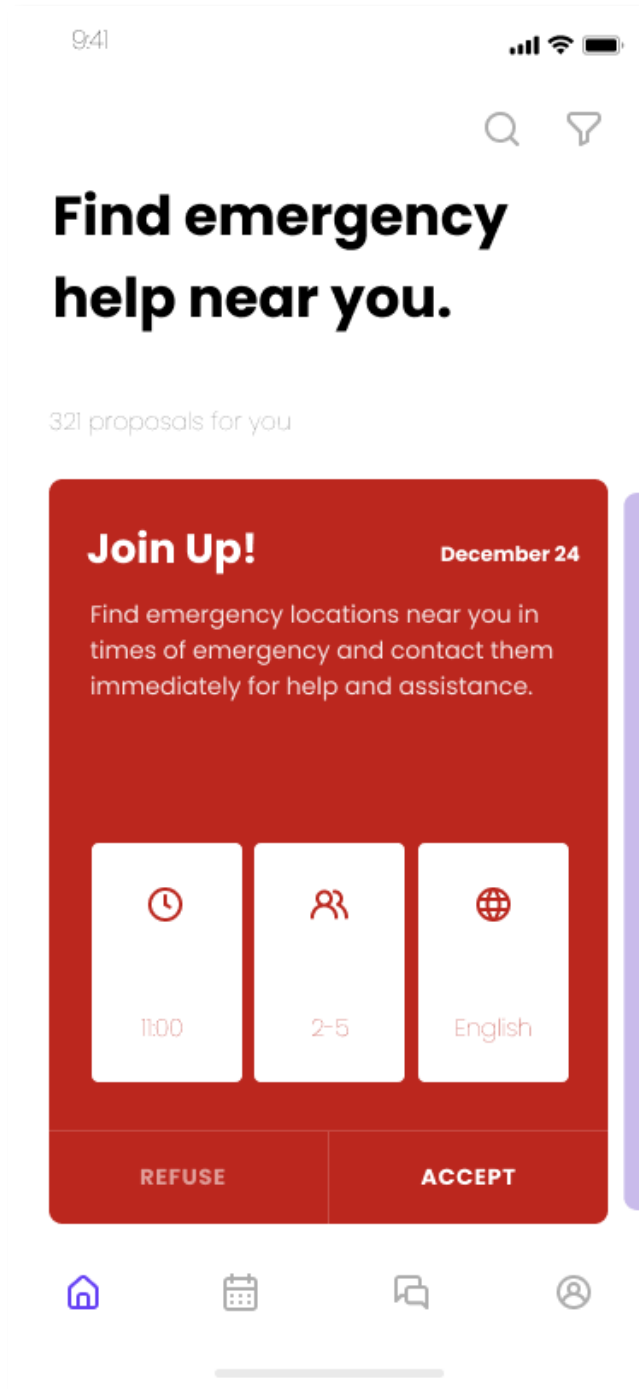
Kaushambi	Indirapuram	Anand V
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Fire Accident

Kaushambi	Indirapuram	Anand V
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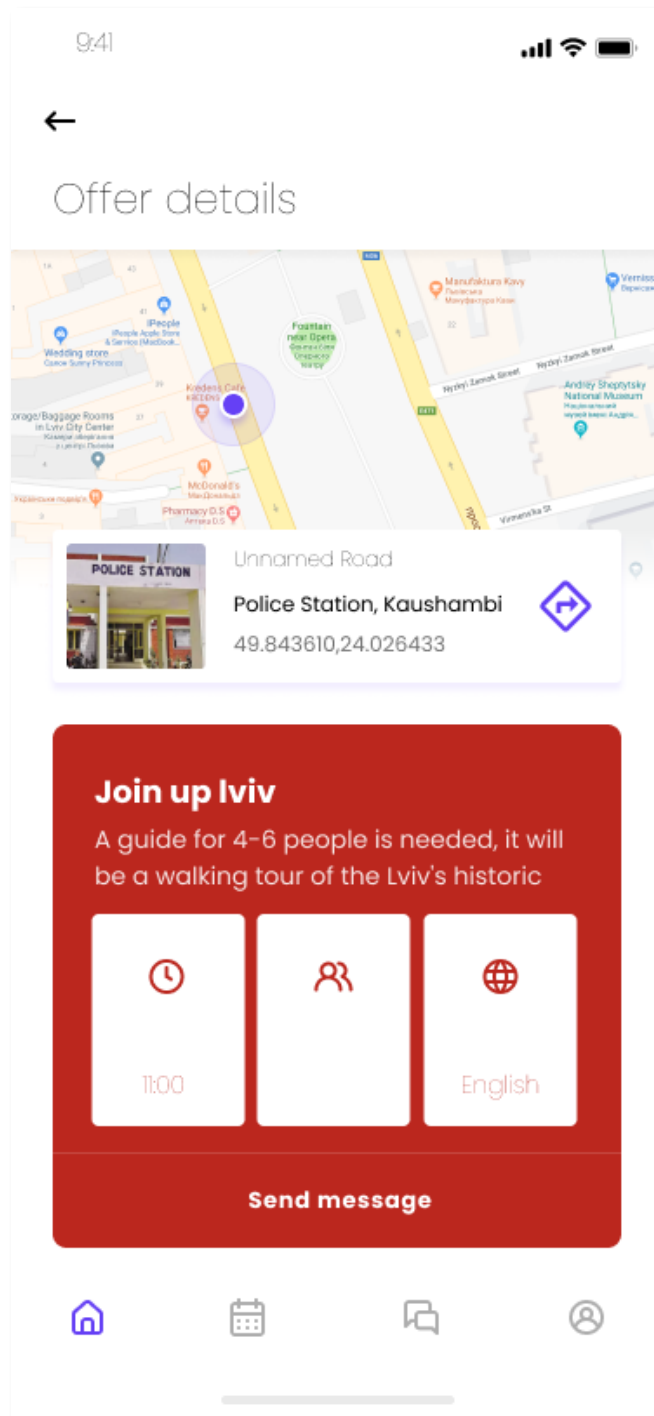
Lets users choose what sort of help they may be in need of depending upon their incident.

REQUESTING HELP



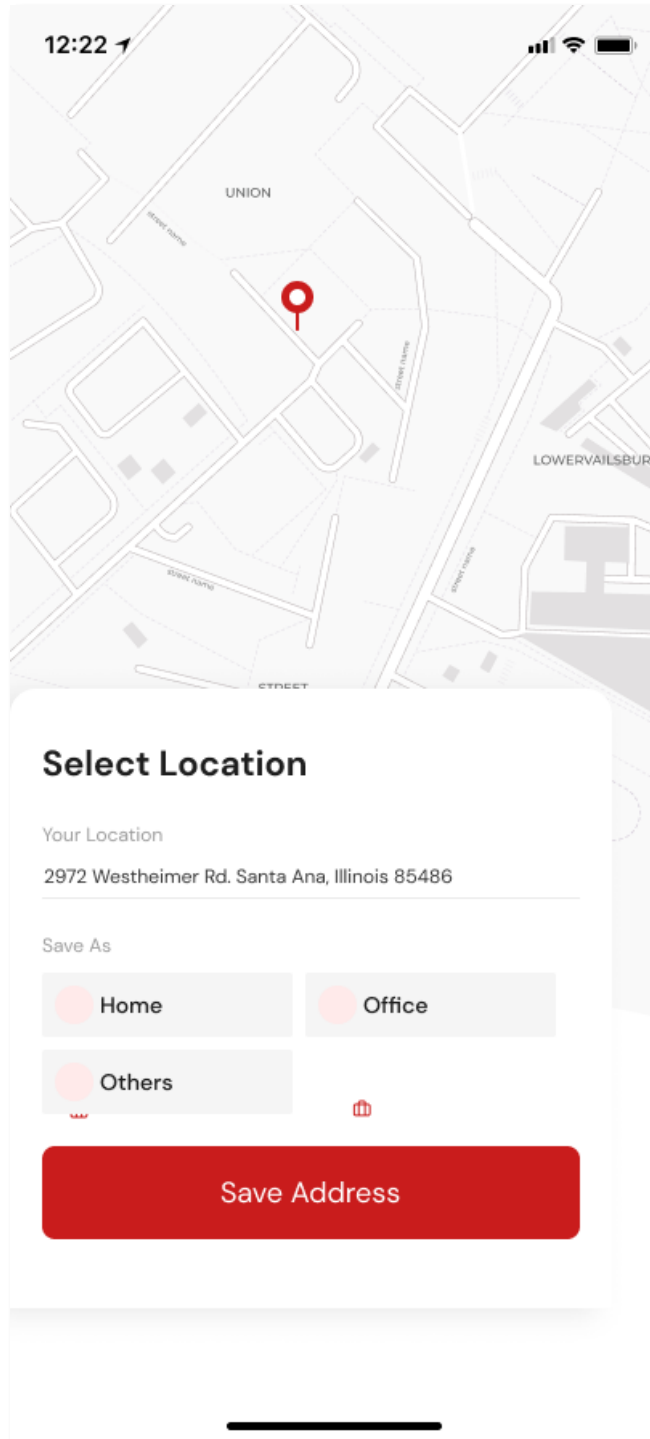
After choosing relevant authorities to contact, users can also make requests

CONFIRM HELP AND ASSISTANCE



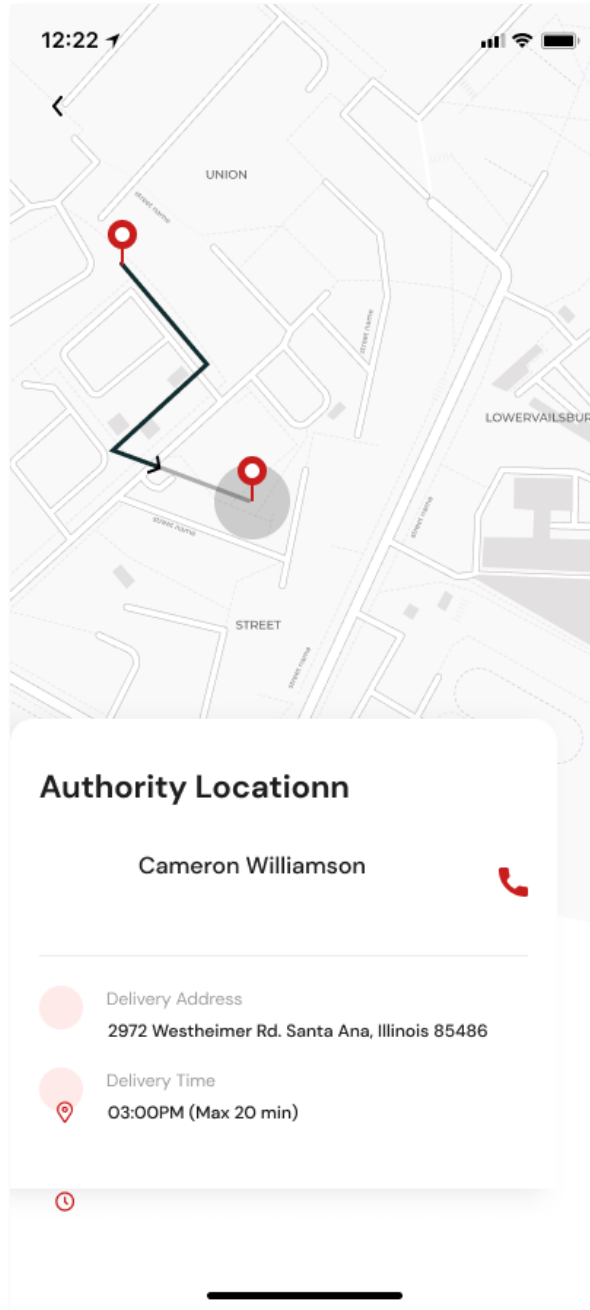
After making a request users have to wait for help to arrive.

CREATING RESOURCES



People in times of perils can also create their own resources on maps

LOCATE AUTHORITY IN MOVEMENT



Users can also track the distance and location of authority personnel

CHAPTER 4

TESTING

The completion of a system will be achieved only after it has been thoroughly tested. Though this gives a feel the project is completed, there cannot be any project without going through this stage. Hence in this stage it is decided whether the project can undergo the real time environment execution without any break downs, therefore a package can be rejected even at this stage.

Testing methods

Software testing methods are traditionally divided into black box testing and white box testing. These two approaches are used to describe the point of view that a test engineer takes when designing test cases.

User Flow Testing

White box testing, by contrast to black box testing, is when the tester has access to the internal data structures and algorithms (and the code that implement these). White box testing methods can also be used to evaluate the completeness of a test suite that was created with black box testing methods. This allows the software team to examine parts of a system that are rarely tested and ensures that the most important function points have been tested. This project is implemented using python with the Django framework. The code consists of models and views which can be tested. Models define the tables stored in SQL and the relationship between the different tables using foreign keys. A view function, or “view” for short, is simply a Python function that takes a web request and returns a web response. This response can be the HTML contents of a Web page, or a redirect, or a 404 error, or an XML document, or an image, etc. Python also provides a file called test.py where we can write u, tests for the models and views. This is very useful as it automates the testing and we no longer have to manually test every page after there were any changes.

The python code is pasted below and each test is explained using comments in the code.

```
from Django. Test import TestCase from info.models import Dept, Class, Course, User, user, authority, Assign, availability from django.urls 43import reverse from django.test.client import Client class InfoTest(TestCase): # function used to create test users
```


User Persona Testing

Black box testing treats the software as a “black box,” without any knowledge of internal implementation. Black box testing methods include: equivalence partitioning, boundary value analysis, all-pairs testing, fuzz testing, model-based testing, traceability matrix, exploratory testing and specification-based testing. We performed black box testing on the authority page to make sure every page was working as desired. We took into consideration various test cases and noted down the results. Below we have recorded various test cases and their respective results.

User Case: 1

Request the availability page for a authority with no assigned classes. The web page loaded with message “authority has no classes assigned”.

User Case: 2

Request the availability page for a authority with 1 assigned class. The web page displayed the assigned class and options to enter availability and view the users.

User Case: 3

Request to enter the availability for an assigned class with one test user 50 The web page displays the user with his/her details and an option to mark present or absent. On marking absent, it can be viewed by the user.

User Case: 4

Request to edit the availability for an assigned class with one test user The user is listed with his/her details and is initially marked as absent from the previous test. On marking present, the availability for that user and can be viewed by the user.

User Case: 5

Request to enter the marks for an assigned class with one user Initially, a list of tests is displays such as internals 1, SEE etc. On selecting one of internals 1, the authority can enter the marks for the user out of 20. On submitting, the status for that test turns green denoting that it has been successfully entered.

User Case: 6

Request to edit the marks for an assigned class with one user. For each class, there is a list of tests such as internals 1, SEE etc. As the marks for internals 1 was already entered in the previous test, it is marked green and there is an option to edit. When editing, the marks already stored is displayed and appropriate changes can be made and saved.

User Case: 7 Request to view the user information for an assigned class with no users The requested page is display with no content and a message stating “This class has no users assigned”

User Case: 8

Request to view the user information for an assigned class with 1 user The web page is the form of a table with entries for user name, USN and their availability percentage, marks in each test including 3 internals, 2 events and 1.

Results of testing

After applying various testing methods such as black box testing, white box testing and acceptance testing, we can conclude that the testing for the software is completed. To summarize the testing phase, white box testing is done using the inbuilt feature of Django to apply u, tests to all the components in the software. After any changes to the software, we can run the tests on the software automatically and thus we can find and eliminate any bugs or errors in the system easily instead of performing rigorous manual testing after every change. In black box testing, we testing all the components and system as a whole. Several test cases were considered and extensive tests were conducted. The results of these tests were positive and any errors were fixed during the testing phase. For acceptance testing, we gave a demonstration of the software to our authority, who is a key stakeholder. After several tests and questions, she was content with results of the tests and software. We have already checked all the modules in the maps by rigorous testing methods and we can say that our maps can handle all type of work done in a University 45without any issues. It is the very useful to the user as well as the faculties to easy access to finding the details. This project is successfully implemented with all the features and modules of the personnel management system as per requirements. The personnel maps provides appropriate information to users based on their profiles and role in the system. This project is designed keeping in view the day to day problems faced by a personnel system.

CHAPTER 5

CONCLUSION

At the end, we find that, the applications were really useful. The tracker unlike others is free of cost. The network connection module developed would be helpful in N number of scenarios where synchronization or data exchange between devices is desired. The pin point module helps us in locating users and at the same time differentiating between custom locations, home location & friends' locations. The availability app is unique for the management of the same in , Noida. Both the B. Tech & M. Tech systems are very well in sync with norm being followed in the institute i.e. availability stored as days for M. Tech. & availability stored in classes for B. Tech. A good number of man-hours would be reduced by the use of same. availability can be taken even when the professor is mobile. It does not depend on network very often. Except first time usage, the app is offline. And the only online usage occurs when we need to sync. Even if we forget to sync data for the previous month, by changing the system date, we can sync data for any previous months.

A EMS is an emergency maps product that helps teachers, users, parents, external vendors, learning suppliers etc. come together via a platform and exchange information. The university administration can automate several of their processes such as availability, announcements, results, campus updates, schedule changes etc. to all concerned persons. There is no limit on the number of features of the university management system, because every university will have its own set of processes that is different from another university. Therefore, a EMS should be able to help universities apply university-specific customizations. College maps system provides a simple interface for maintenance of different user, department, faculties, library and others information. All the colleges usually have a number of departments and emergency modules such as courses, seminar hall, etc. Managing all these departments and other modules manually is a very difficult and hard, ineffective and expensive task. So here we propose an maps system for college.

Our college maps system has all the information about the users, teachers, events, library, departments and other respected information. The system allows the admin to add users, faculties and any other events. Our system allows a faculty to enter or input user's availability into the database which can later be viewed by users and faculties. The users can view his/her availability through a separate user login. The admin can upload the timetables for various departments for exam preparation. The time table is then available to be viewed by

faculties and users on the web portal. These systems have easy user interface and have powerful data management system which makes this system is very

FUTURE SCOPE

The future will most likely see a rush in demand for higher emergency BI-powered EMSs. Using business intelligence dashboards, it will be easy to track key performance indicators, real-time metrics, or any other key user data that could be easily tracked, allowing teachers to make smart decisions with all the information required. By using an EMS institution can track availability and studying reports generated to help faculties and users to have better learning platforms.

- **Automation of tracking and notifications**

Automation is one of the most important functions that an EMS provides, a higher emergency EMS automates the complete day-to-day tasks. users in today's era demand easier access to everything like marking availability, fetching timetables and all other tasks, and predicting the future. There are more chances that users will only like institutes that will provide their complete automation and real-time access to things from admission form to result in the announcement.

- **Advances in technology**

Opting for cloud-based higher emergency management software will allow institutions to adopt advances in technology that can help in teaching and learning patterns. With all these, it is also easier to predict that one can anticipate more options and more advanced features using e-learning EMSs in the future.

- **Customization and personalization**

According to the emergency EMS Market Size and Forecast, growing demand for modern learning has improved the level of the emergency system, improved performance of the academic and administrative department, and enhanced connectivity have made EMS essential for higher emergency institutions. It is not wrong to estimate that modern trends and technologies are improving the chances of incredible future growth of institutions using EMS. A good and robust EMS provides the personalization and customization of tools and technologies that are needed by the institutions.

Commenting on the personalization of systems using EMS, I can conclude that an EMS will get more powerful having stronger implementation and customization of each institution's process but for these, institutions must choose a flexible, robust, and well-integrated EMS system.

- **Better communication**

EMS software can help users and faculty to learn properly bridging the gap between them. It helps institutions with updating all the lessons, assignment details, faculty's availability and other related information, managing availability, enrollment tasks, examinations, and all other tasks managing better communication.

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