1. INTRODUCTION

1.1 Project Description

I had seen heaps of individuals hunting down Mechanics or Garages in view of their vehicle issues, particularly when they gone to new places. And furthermore if the general population know the carport they will be unable to get the vehicle to the carport. A portion of the issues like this propelled me to do this project.

"Vehicle Support" system comprises of android applications created on java platform. There are essentially 3 unique jobs sorted as Admin, Mechanic and Public or User. In view of the specific job's activities/capacities they are partitioned extraordinarily, keeping up the distinctions as per their usefulness.

Providing location and direction services is the major part of the project and this can be done with the help of Firebase real time database.

The “Vehicle Support” system consists of two android applications, namely

- Vehicle Service, and
- Vehicle Mechanic.

The "Vehicle Service" android applicationwill gives a decent User Interface to the clients who are need of administration to their vehicle and to get the administration from the Mechanic closest their area.

The "Vehicle Mechanic" is an android application and especially for Mechanics to give administration to closest client who need administration.

Aim:

Provide services to the public or customer who is in need of a mechanic in their location by providing two way location visibility to both mechanic and customers through applications.

Purpose:

The purpose of this project is to create applications for reduce time and effort of customer in finding of mechanic to get administration to their vehicles in their location.

Scope of the project:

The main scope of the project is to find a repairman who is nearest to the location of the public or customer who is in need of a repairman and provide two way location perceivability to get monitoring each other.

Objectives:

- To design and develop android application to provide services to the user who are in need of a mechanic.
- To provides simple and easy user interface.
- To make effective use of The Google services.
- To provideseasy way for both the user and the mechanic to locate each other.

2. LITERATURE SURVEY

2.1 Intr0duction

Literature survey is something when you look at a literature (publications) in a surface level, or an Ariel view. It includes the survey of place people and a publication is context of Research. It is a phase where the researcher tries to know of what is all the literature related to one area of interest. And the relevant literatures are short-listed. And in general, a literature survey guides or helps the researcher to define/find out/identify a problem.

2.1.1 Existing system

There is no current android application which gives two way area perceivability to the clients and mechanics. The Google will provide the location details of the mechanics who are all nearer to customer but it would not provide other details like weather the mechanic had started or not, how much time may require to reach the customer and so forth.

Disadvantages of Existing system

- The Google will only provide the basic information about the Garages or Mechanic to the Customer.
- The Google will not provide details about the mechanic like weather the mechanic is available or not.
- It will not show the location of the customers to the mechanics.
- Even it shows the location of the mechanic to the customer, it won't show the directions.

2.1.2 Proposed system

In the proposed Vehicle Support versatile system, the data about the Mechanic will be noticeable to the client and the area of the client will be unmistakable to the technician. This framework gives a simple route to the general population or client to locate the specialist close to him and get the administration as conceivable as quick since technician give benefits in the client area.

Technician who is intrigued to serve through the application ought to be enrolled to the application and ought to consent to the terms and states of the system. Once there is a request for the service, should provide service to the customer by reaching the customer location.

Customers who needs to get administration through the application ought to be register and signed in. At the point when there is a requirement for the repairman, the client ought to give some important subtleties like sort of vehicle and so on to get the administration.

Advantages of Proposed system

- At the point when there is a requirement for technician, the application will give an effective method to discover and get administration notwithstanding when the client is new to that place.
- Use of this application will incredibly decrease time.

2.2 Feasibility Study

The key considerations involved in feasibility study are:

- Economic feasibility
- Technical feasibility
- Operational feasibility

With current equipment, existing software technology, it is also possible of expanding.

Economic feasibility

Money saving advantage examination is an every now and again utilized strategy for assessing the adequacy of the proposed system. In monetary possibility study or Cost investigation, the advantages and reserve funds of proposed framework are resolved and contrasted them and cost. The diverse kinds costs brought about are pursues.

Manpower cost

The improvement of the task is finished. Any adjustment, support and upgrades will be done-in house as it were. So there are no additional labor expenses to be brought about for this undertaking.

Hardware and Software cost

The undertaking planned and created utilizing existing equipment and programming assets accessible in web. So the expense acquired under this can be kept to an absolute minimum.

Technical feasibility

It centers around the likelihood of doing extend the framework created and the specialized certifications of precision, unwavering quality, simple entry and furthermore information security.It is noticed that the applications are android applications, which are easy to use and simple work on.

Operational feasibility

The task will be utilized by the association under various conditions. Anybody can work with this application as it bolsters easy to understand approach. It gives graphical UIs to the client, so client can undoubtedly communicate with the application. Clients no need the information about Android, FIREBASE ideas to utilize the application. The application is planned so that it tends to be effectively actualized in any android adaptation gadget or cell.

2.3 Tools and Technologies used

Android Studio

Android Studio is the authority coordinated improvement condition (IDE) for Google's Android working System, based on JetBrains' IntelliJ IDEA programming and structured explicitly for Android advancement. It is accessible for download on Windows, macOS and Linux based working frameworks. It is a substitution for the Eclipse Android Development Tools(ADT) as the essential IDE for local Android application improvement.

Android Studio was reported on May 16, 2013 at the Google I/O gathering. It was in early access review arrange beginning from variant 0.1 in May 2013, at that point entered beta stage beginning from rendition 0.8 which was discharged in June 2014. The principal stable form was discharged in December 2014, beginning from adaptation 1.0.

The accompanying highlights are given in the present stable rendition,

- Gradle-based form support
- Android-explicit refactoring and handy solutions
- Lint instruments to get execution, ease of use, variant similarity and different issues
- ProGuard combination and application marking abilities
- Template-based wizards to make normal Android plans and segments
- A rich design editorial manager that enables clients to move UI segments, alternative to review formats on different screen arrangements.
- Support for structure Android Wear applications.
- Android Virtual Device (Emulator) to run and troubleshoot applications in the Android studio.

Android Studio underpins all a similar programming dialects of IntelliJ (and CLion) for example Java, C++, and more with expansions, for example, Go and Android Studio 3.0 or later backings Kotlin and Java 7 language highlights and a subset of Java 8 language highlights that differ by stage adaptation. Outer tasks backport some Java 9 highlights. While IntelliJ that Android Studio is based on backings all discharged Java adaptations, and Java 12, it's uncertain to what level Android Studio bolsters Java forms up to Java 12 (the documentation specifies incomplete Java 8 support). Probably some new dialect includes up to Java 12 are usable in Android.

Java in Android

Hindrances to improvement incorporate the way that Android does not utilize built up Java principles, for example Java SE and ME. This avoids similarity between Java applications composed for those stages and those composed for the Android stage. Android just reuses the Java language linguistic structure and semantics, yet it doesn't give the full class libraries and APIs packaged with Java SE or ME.

Features of Java Language

- Simple
- Object-oriented
- Interoperability
- Type safe
- Platform Independence
- Security
- Reliability
- Language Feature

Software Stack

Over the Linux piece, there are the middleware, libraries and APIs written in C, and application programming running on an application structure which incorporates Java-good libraries. Improvement of the Linux bit proceeds autonomously of Android's other source code ventures.

Android utilizes Android Runtime (ART) as its runtime condition (presented in rendition 4.4), which utilizes early (AOT) accumulation to altogether aggregate the application byte code into machine code upon the establishment of an application. In Android 4.4, ART was an exploratory component and not empowered as a matter of course; it turned into the main runtime choice in the following real form of Android 5.0.

In forms never again upheld, until adaptation 5.0 when ART dominated, Android recently utilized Dalvik as a procedure virtual machine with follow based in the nick of time (JIT) gathering to run Dalvik "dex-code" (Dalvik Executable), which is normally interpreted from the Java byte code. Following the follow based JIT rule, notwithstanding deciphering most of utilization code, Dalvik plays out the arrangement and local execution of select regularly executed code portions ("follows") each time an application is propelled.

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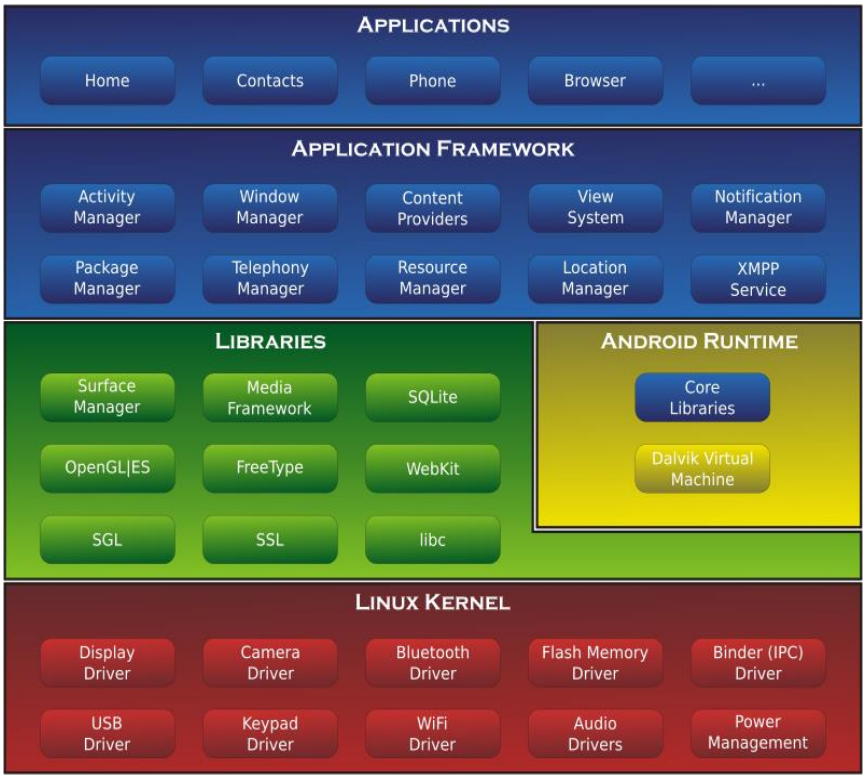

Fig 2.1 Software Stack

Following the follow based JIT rule, notwithstanding deciphering most of utilization code, Dalvik plays out the arrangement and local execution of select regularly executed code portions ("follows") each time an application is propelled.

For its Java library, the Android stage utilizes a subset of the now ended Apache Harmony venture. In December 2015, Google reported that the following variant of Android would change to a Java usage dependent on the Open JDK venture.

Firebase Realtime Database

Store and match up information with our NoSQL cloud database. Information is matched up over all customers in realtime, and stays accessible when your application goes disconnected.

The Firebase Realtime Database is a cloud-facilitated database. Information is put away as JSON and synchronized in realtime to each associated customer. When you fabricate cross-stage applications with our iOS, Android, and JavaScript SDKs, the majority of your customers share one Realtime Database occasion and consequently get refreshes withthe most current information.

Key Capabilities

Realtime

Rather than run of the mill HTTP demands, the Firebase Realtime Database utilizes information synchronization—each time information changes, any associated gadget gets that update inside milliseconds. Give community and vivid encounters without pondering systems administration code.

Offline

Firebase applications stay responsive notwithstanding when disconnected in light of the fact that the Firebase Realtime Database SDK continues your information to circle. When network is restored, the customer gadget gets any progressions it missed, synchronizing it with the present server state.

Accessible from Client Devices

The Firebase Realtime Database can be gotten to legitimately from a cell phone or internet browser; there's no requirement for an application server. Security and information approval are accessible through the Firebase Realtime Database Security Rules, articulation based guidelines that are executed when information is perused or composed.

Scale across multiple databases

With Firebase Realtime Database on the Blaze estimating plan, you can bolster your application's information needs at scale by part your information over numerous database

examples in a similar Firebase venture. Streamline verification with Firebase Authentication on your task and confirm clients over your database occurrences.

Android SDK:

Android software development is the process by which new applications are created for devices running the Android operating system. Google states that "Android apps can be written using Kotlin, Java, and C++ languages" using the Android software development kit (SDK), while using other languages is also possible. All non-JVM languages, such as Go, JavaScript, C, C++ or assembly, need the help of JVM language code, that may be supplied by tools, likely with restricted API support. Some languages/programming tools allow cross-platform app support, i.e. for both Android and iOS. Third party tools, development environments and language support have also continued to evolve and expand since the initial SDK was released in 2008.

2.4 Hardware and Software Requirements

Hardware Requirements:

- Processor : Pentium Dual Core.
- Memory space : 8 GB and above
- Monitor : 15'' LED
- Input Devices : Keyboard, Mouse
- RAM : 1 GB

Software Requirements

- Development Environment : Android Studio
- Programming Language : Java
- Operating System : Windows 8, Windows 7(Minimum)
- Android Version : API Level 17 and above
- Database : Firebase realtime database

2.5 Approach Adopted

According to Software Engineering the approach adopted to develop this project is the Iterative Waterfall Model. The Iterative Waterfall Model is a systematic approach that begins at the feasibility study phase and progress through analysis, design, coding, testing, integration and maintenance. Feedback paths are there in each phase to its preceding phase as show in the fig: 1 to allow the correction of the errors committed during a phase that are detected in later phase.

The following illustration is a representation of the different phases of the Waterfall Model.

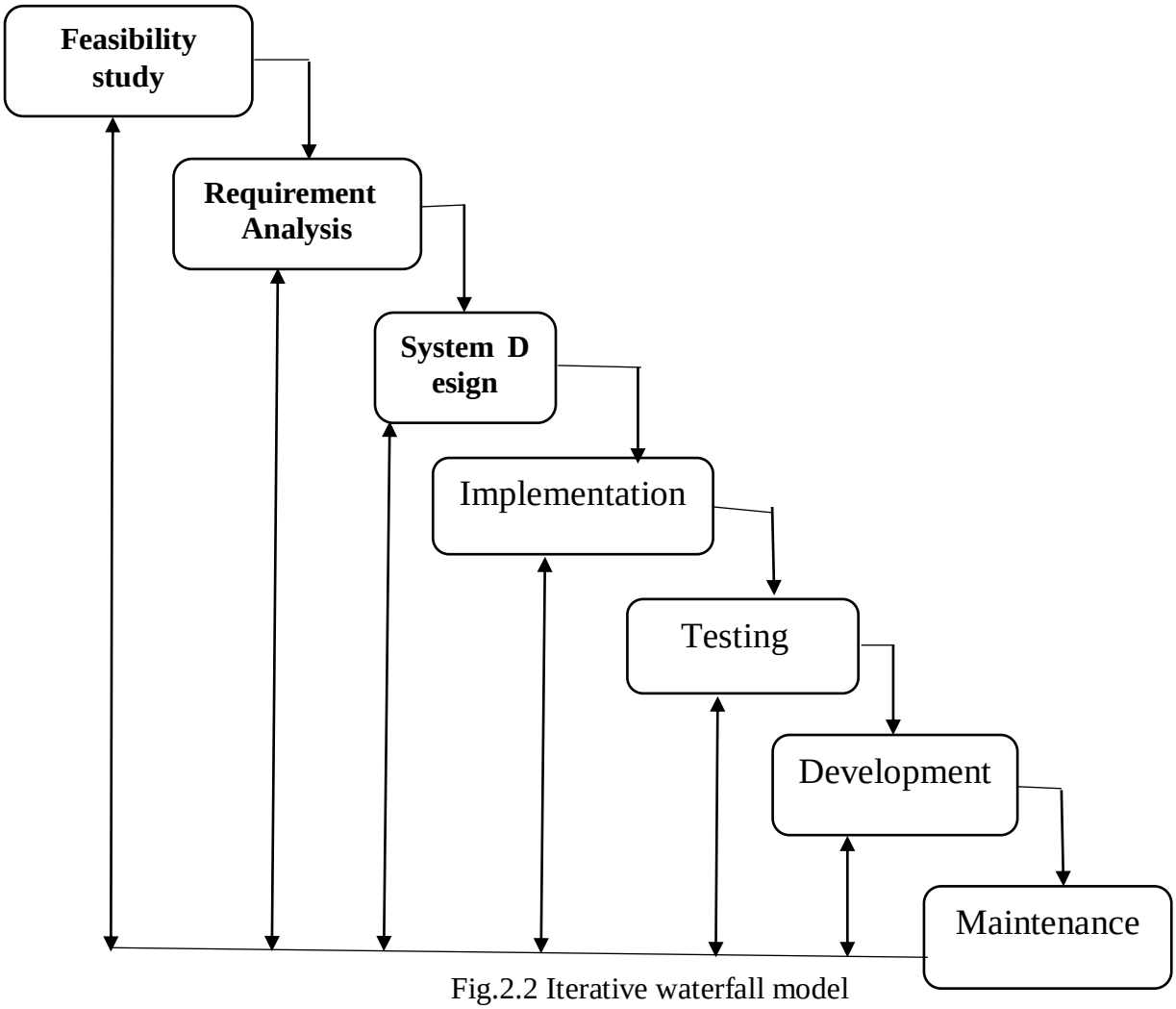

Fig.2.2 Iterative waterfall model

3. SOFTWARE REQUIREMENTS SPECIFICATION

The purpose of the Software Requirement specification (SRS) is to give the Customer a clear and precise description of the functionality of the assessment support software to be developed and to eliminate ambiguities and misunderstanding that may exist. For the developer, it will be a reference point during software design, implementation and maintenance.

A **Software Requirements Specification (SRS)** – A requirements specification for a software system – is a complete description of the behavior of a system to be developed. It includes a set of use cases that describe all the interactions the users will have with the software. In addition to use cases, the SRS also contains non-functional requirements. Non-functional requirement are requirements which impose constraints on the design of implementation (such as performance engineering requirements, quality standards, or design constraints)

The SRS is regularly alluded to as the "parent" report since all ensuing venture the executives records, for example, structure details, explanations of work, programming engineering particular, testing and approval plans, and documentation plans, are identified with it.

3.1 Users

- Admin
- Mechanic
- Public or Customer

Admin

- Admin is in charge of dealing with every one of the clients and mechanics who are altogether enlisted to the system.

Mechanic

- Specialist who is interested to serve through the application should be enlisted to the application and should agree to the terms and conditions of the system.
- At the point when there is a solicitation for an administration he ought to give administration to the client by achieving the client area.

Public

- Public who needs to get organization through the application should be register and logged in.
- Exactly when there is a necessity for the expert, the customer should give some principal nuances like sort of vehicle, etc to get the organization.

3.2 Functional Requirements

- Since the system works with real time data, the users of the system need to be connected with the internet.
- Since the application make use of the location service the GPS in the users' devices should work properly.
- The GPS should track the location details whenever the location changed or when the given time stamp elapsed.
- The "Vehicle Service" application should be able to find the mechanic who is nearest to customer location.
- The applications should show a direction between exact locations of customer and mechanic.

3.3 Non Functional Requirements

The item should bolster the end clients' prerequisites. The item is equipped for handling when the expansive quantities of records are given as info and furthermore it must be intuitive and the defers included ought to be less. So in each activity reaction of the applications, there are no prompt deferrals.

Safety and Security Requirements:

- The system should be designed in a secured way by applying safety measures.
- Data transmission ought to be safely transmitted to hubs with no adjustments in data.
- Uncommon exemption dealing with component ought to be set up to maintain a strategic distance from framework mistakes.

Software Quality Attribute

Availability:

The application won't hang and opens rapidly and with 99.9% uptime.

Reliability:

The applications ought not to crash and ought to distinguish invalid info and produce appropriate blunder message.

Usability:

The interface ought to be natural and effectively safe and easy to use.

Integrity:

The product does not store any reserve information or doesn't utilize system assets in foundation.

4. SYSTEM DESIGN

Design is the first step in the development phase for any engineering product or system. It may be defined as "the process of applying various techniques and principles for the purpose of defining a devise, a process or a system in sufficient detail to permit its physical realization".

A System design is a description of the structure to be implemented, the data which is a part of the system, the interfaces between system components and sometimes, the algorithms used. Designers do not arrive at a finished design immediately but they develop the design iteratively through a number of different versions. The iterations is done until the final system design is not achieved which is close enough to the requirements specifications. Iteration acts a feedback of the previous iteration which helps in the improvement of the subsequent iteration.

System design is a "how to" approach to the creation of a new system. It provides the understanding and procedural details necessary for implementing the system recommended in the feasibility study. Software design is starting with what is needed; design takes us towards how to satisfy the needs. The design of a system is the most critical factor affecting the quality of the software. The output of this phase is design document. The document is used later during implementation, testing and maintenance.

4.1 System Perspective

The aim of the system is to provide services to the public who is in need of a mechanic by knowing their location.

The principle goal of the system is to give an Interface to application clients particularly for Public who need a technician. Through this system the User can see the subtleties of a mechanics who is closer to his area and can get in touch with him to get administration.

Architecture

Three-tier (layer) is a client-server architecture in which the user interface, business process (business rules) and data storage and data access are developed and maintained as independent modules or most often on separate platforms.

The Architecture of Application is based on three-tier architecture. The three logical tiers are

- Presentation tier – XML Forms, Images.
- Middle tier –Java classes.
- Data tier- Firebase Database

The main reason for considering three-tier architecture for the Application is as follows:

Flexibility:

- Management of data is independent from the physical storage support,
- Maintenance of the business logic is easier,
- Migration to new graphical environments is faster.
- If there is a minor change in the business logic, we don't have to install the entire system in individual user's PCs.

Reusability:

- Reusability of business logic is greater for the presentation layer. As this component is developed and tested, we can use it in any other project and would be helpful for future use.

Security:

- More secured architecture since the client cannot access the database directly.

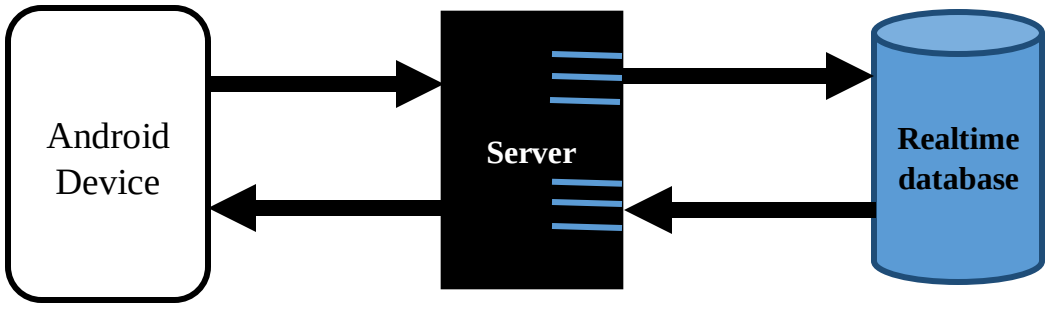

Fig.4.1. 3-tier Architecture

Presentation tier

The presentation tier for the application contain XML for front view. The presentation tier takes care of the user interaction and the visual part of the application. The various activities used by clients are listed below.

Middle Tier

The Middle Tier or Business Logic layer consists of before delving further into the practical matters of Android application development, however, it is important to gain an understanding of some of the more abstract concepts of both the Android SDK and Android development in general. Gaining a clear understanding of these concepts now will provide a sound foundation on which to build further knowledge.

Data Tier

The Data Tier layer consists of database such as the data tier mainly concentrated on manipulating the data using a database management system. Here we implement the data tier using Firebase.

4.2 Context Diagram

We usually begin by drawing a context diagram, a simple representation of the whole system. Context level DFD, also known as level 0 DFD, sees the whole system as a single process and emphasis the interaction between the system and external8entities.

Level-0

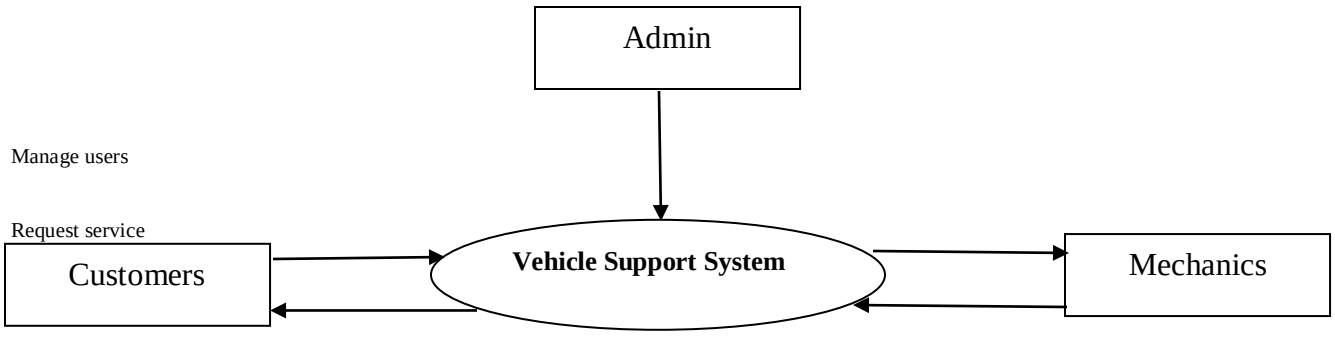

Fig.4.2. Level 0 Context diagram

Data flow Diagrams

Level-1

Customer Module

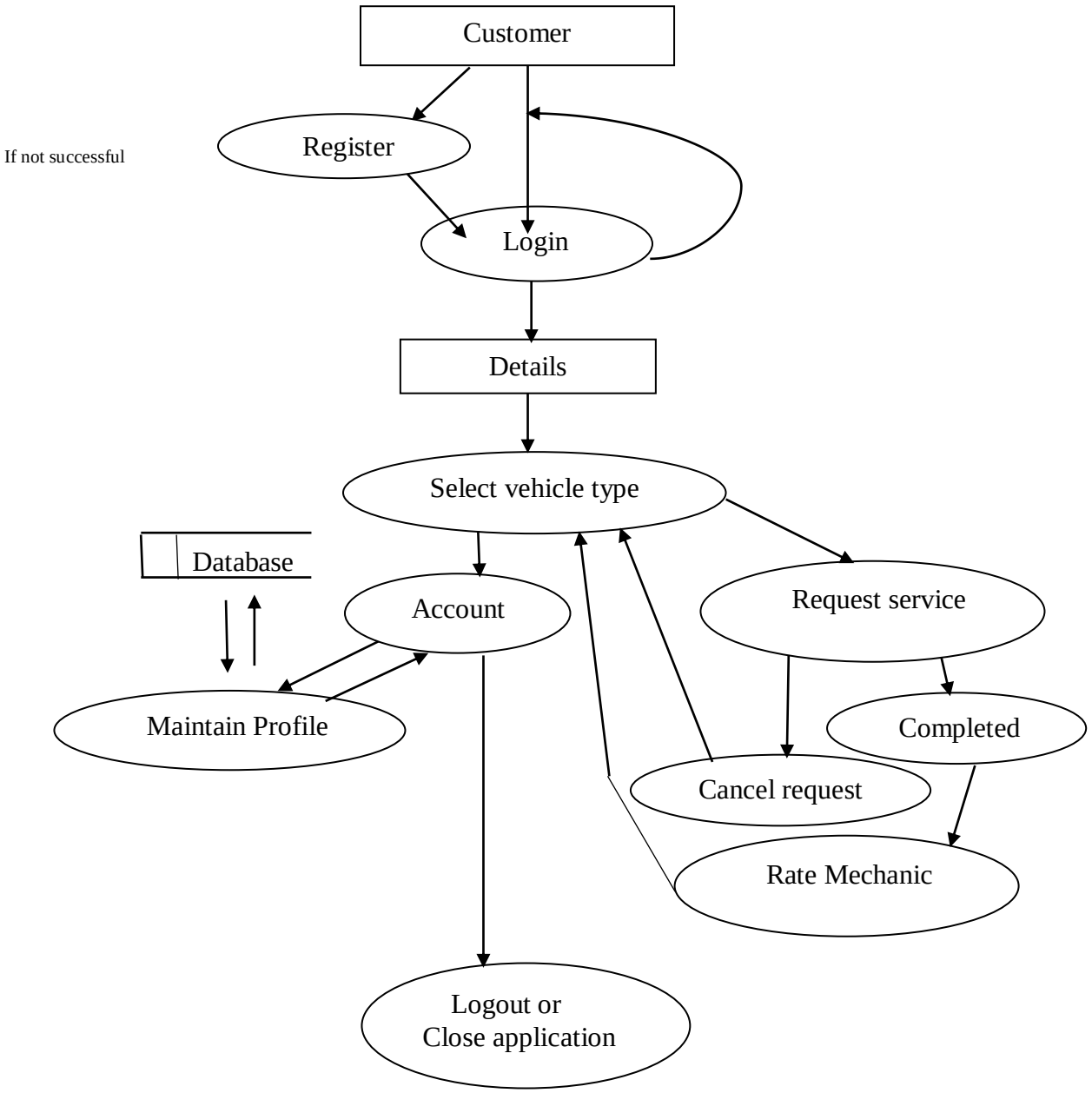

Fig.4.3. Customer dataflow diagram

Mechanic Module

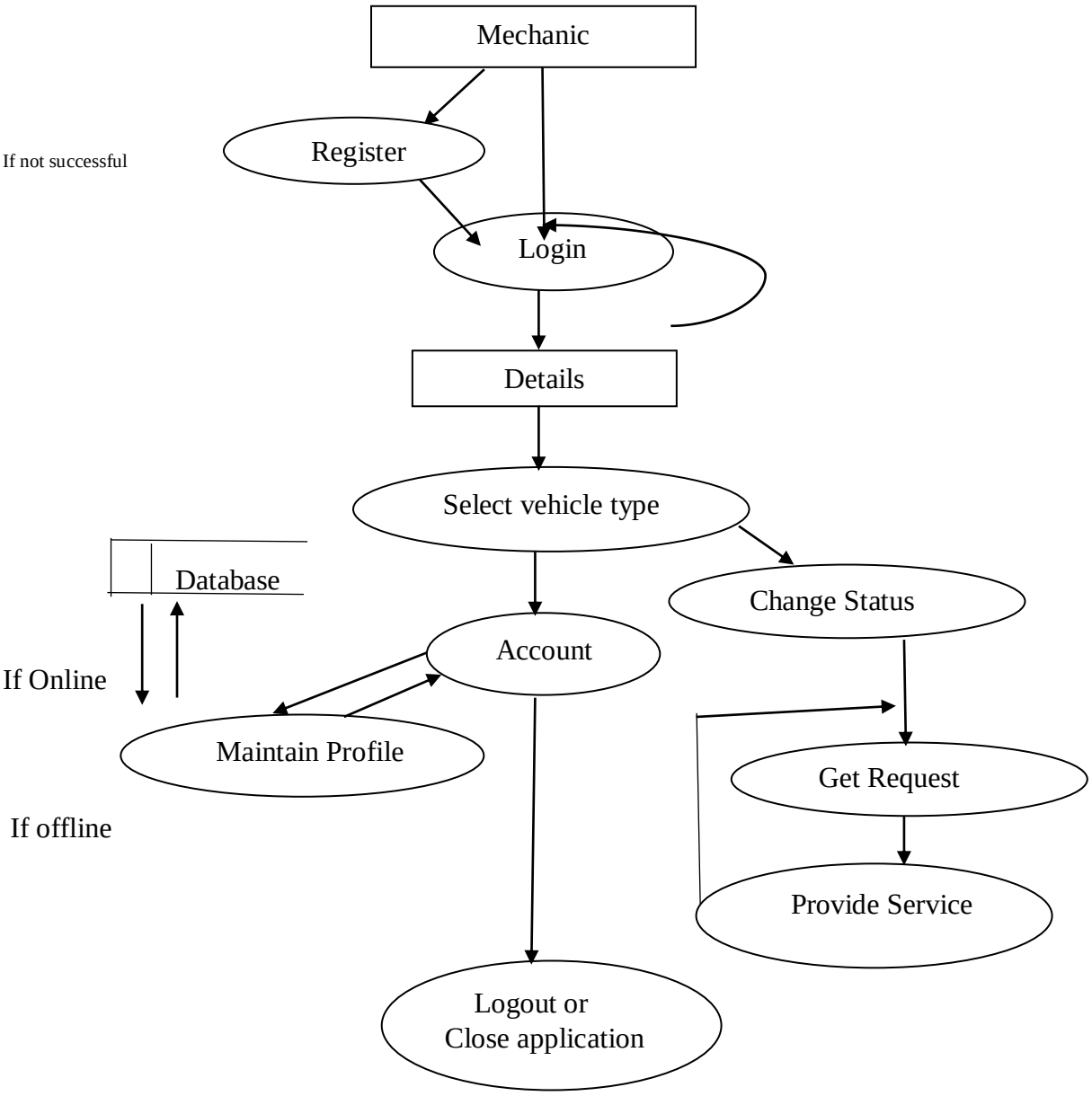

Fig.4.3. Mechanic dataflow diagram

5. DETAILED DESIGN

Introduction

Detailed design starts after the system design phase is completed and the system design has been certified through the review. The goal of this phase is to develop the internal logic of each of the modules identified during system design.

In the system design, the focus is on identifying the modules, whereas during detailed design the focus is on designing the logic for the modules. In other words in system design attention is on what components are needed, while in detailed design how the components can be implemented in the software is the issue.

The design activity is often divided into two separate phase system design and detailed design. System design is also called top-level design. At the first level focus is on deciding which modules are needed for the system, the specifications of these modules and how the modules should be interconnected. This is called system design or top level design. In the second level the internal design of the modules or how the specifications of the module can be satisfied is decided. This design level is often called detailed design or logic design.

5.1 Use Case Diagrams

Use case chart is a diagram of entertainers, a lot of utilization cases encased by a framework limit, correspondence relationship between the on-screen character and the utilization case. The utilization case graph portrays how a system connects with outside entertainers; each utilization case speaks to a bit of usefulness that a system gives to its clients.

An utilization case is known as an oval containing the name of the utilization case and an entertainer is appeared as a stick figure wiıh the name of the on-screen character underneath the figure.

The utilization cases are utilized amid the examination period of an undertaking to recognize and segment system usefulness. They separate the framework into entertainers and use case. On-screen characters speak to jobs that are played by client of the framework.

Those users can be humans, other computers, pieces of hardware, or even other software systems.

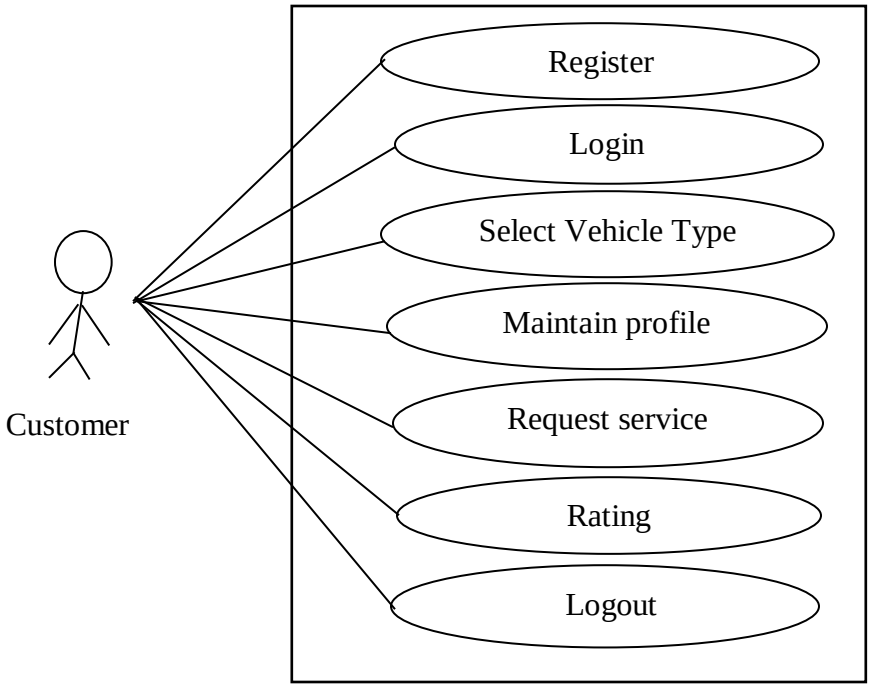

Fig.5.1 Customer Use case Diagram

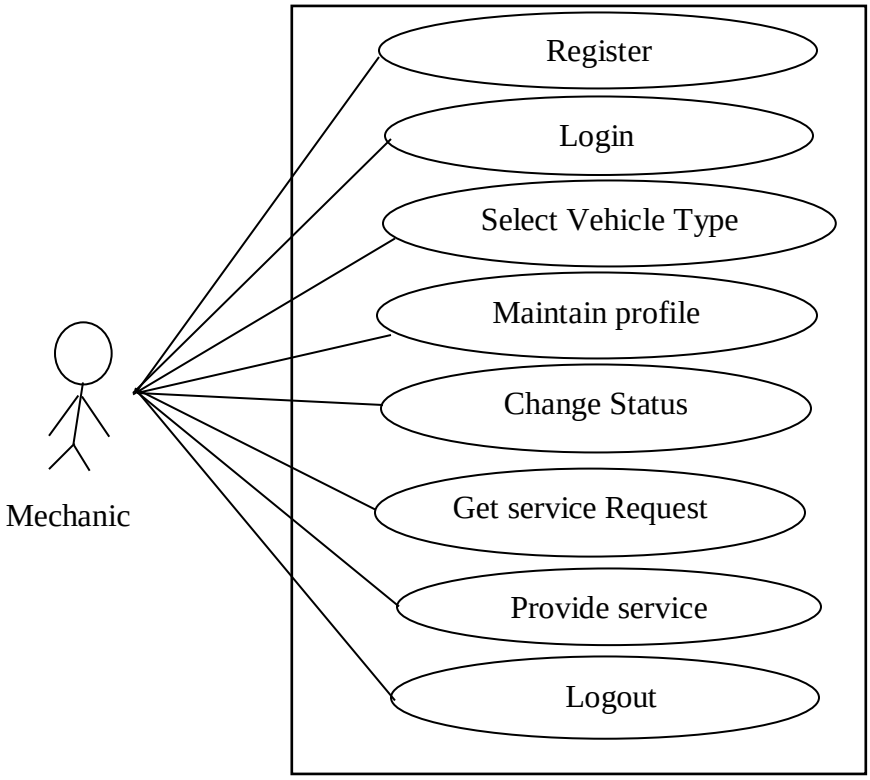

Fig.5.2 Mechanic Use case Diagram

5.2Sequence Diagram

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are sometimes called **event diagrams**, **event scenarios.**

Purpose

The sequence diagram is utilized essentially to demonstrate the communications between items in the successive request that those associations happen. One of the essential employments of arrangement charts is in the change from necessities communicated as use cases to the following and progressively formal dimension of refinement.

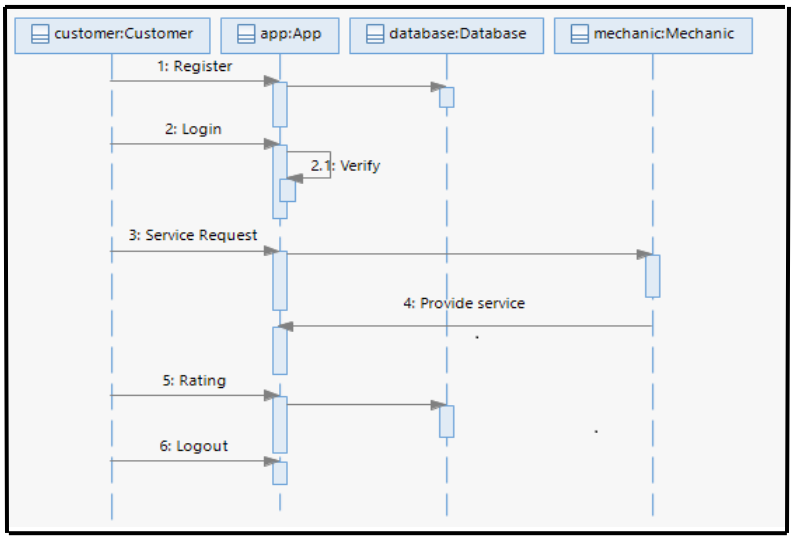

Fig. 5.3 Customer Sequence diagram

The above Fig.5.3 is a sequesnce diagram ofa customer, the figure shows that the customer needs to register for the system first and itwill be stored in the database and verified while logging in. After the succeful login the customer can manage his profile. If there is need of service to the vehicle the customer can request for a repairman and the application will find a

nearest mechanic to the customer location and the customer can get service from the mechanic. After gettingg the service the customer needs to rate the mechanic to show their satisfaction.

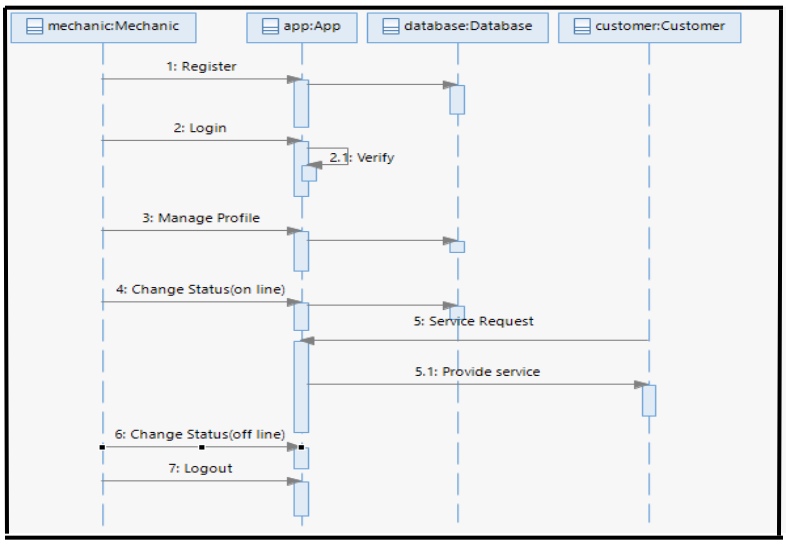

Fig. 5.4 Mechanic Sequence diagram

The above Fig 5.4 is a sequence diagram of a Mechanic, the Mechanic who needs to provide service through the application needs to register to the sysytem and all the cetails will be stored in database and will be verified. While logging in, the entered data are verified. After a successful login, the machanic can manage his profile. To get service request the mechanic needs to in “Online” mode so that need to change status. Once the mechanic get service request by the customer, needs to provide service by reaching the customer location. The mechanic can change his status to “Offline” mode if not want to get service request. After all the process, the mechanic can logout if he want or he can stay logged in for rapid use of application.

5.3 Collabaration Diagram

A collaboration diagram, also called a communication diagram or interaction diagram, is a representation of the connections and cooperations among programming objects in the Unified Modeling Language (UML). The idea is over 10 years old in spite of the fact that it has been refined as demonstrating ideal models have developed.

In many cases, a collaboration diagram will show how a system made up of individual software pieces works in real time.

For the most part, the names on a joint effort outline are dictated by the requirements of the client base. Somebody making this sort of asset may utilize real document names, nonexclusive expressions speaking to the capacity of projects, or even modified symbols to indicate how bits of a system cooperate.

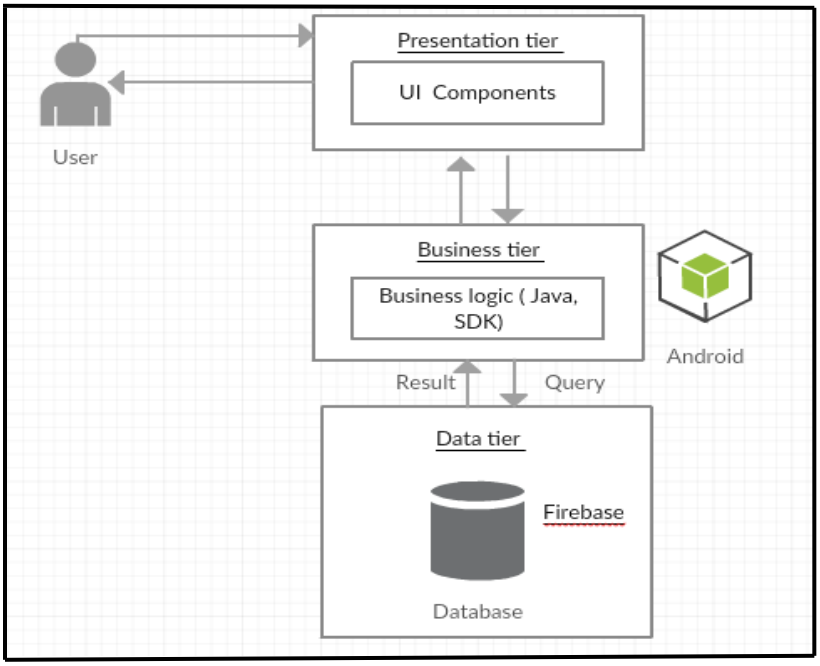

Fig.5.5 Collabaration diagram

5.4 Activity Diagrams

Activity diagrams represent the business and operational workflows of a system. An Activity diagram is a dynamic diagram that shows the activity and the event that causes the object to be in the particular state. It is a simple and intuitive illustration of what happens in a workflow, what activities can be done in parallel, and whether there are alternative paths through the workflow.

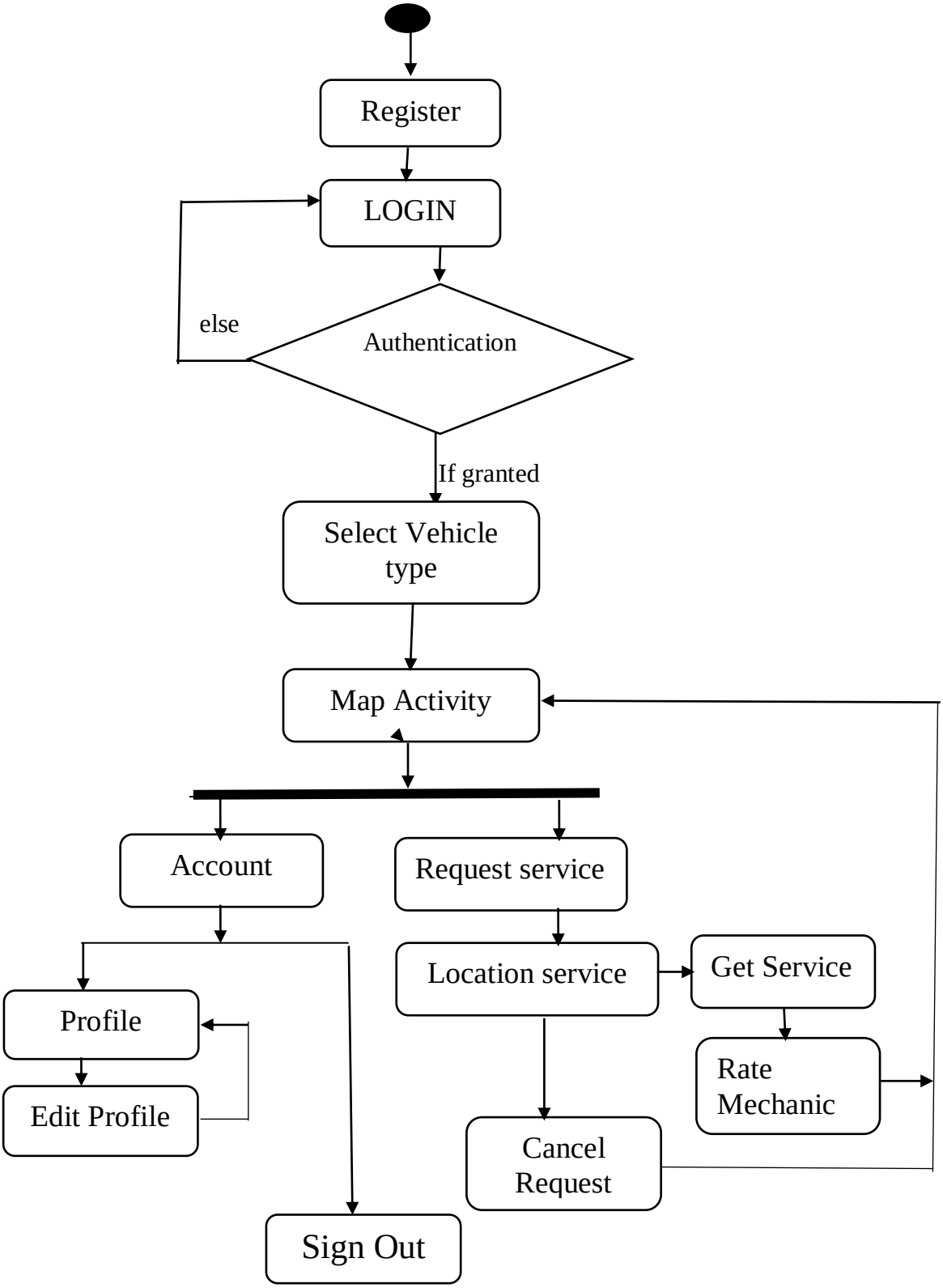

Fig.5.6 Customer Activity diagram

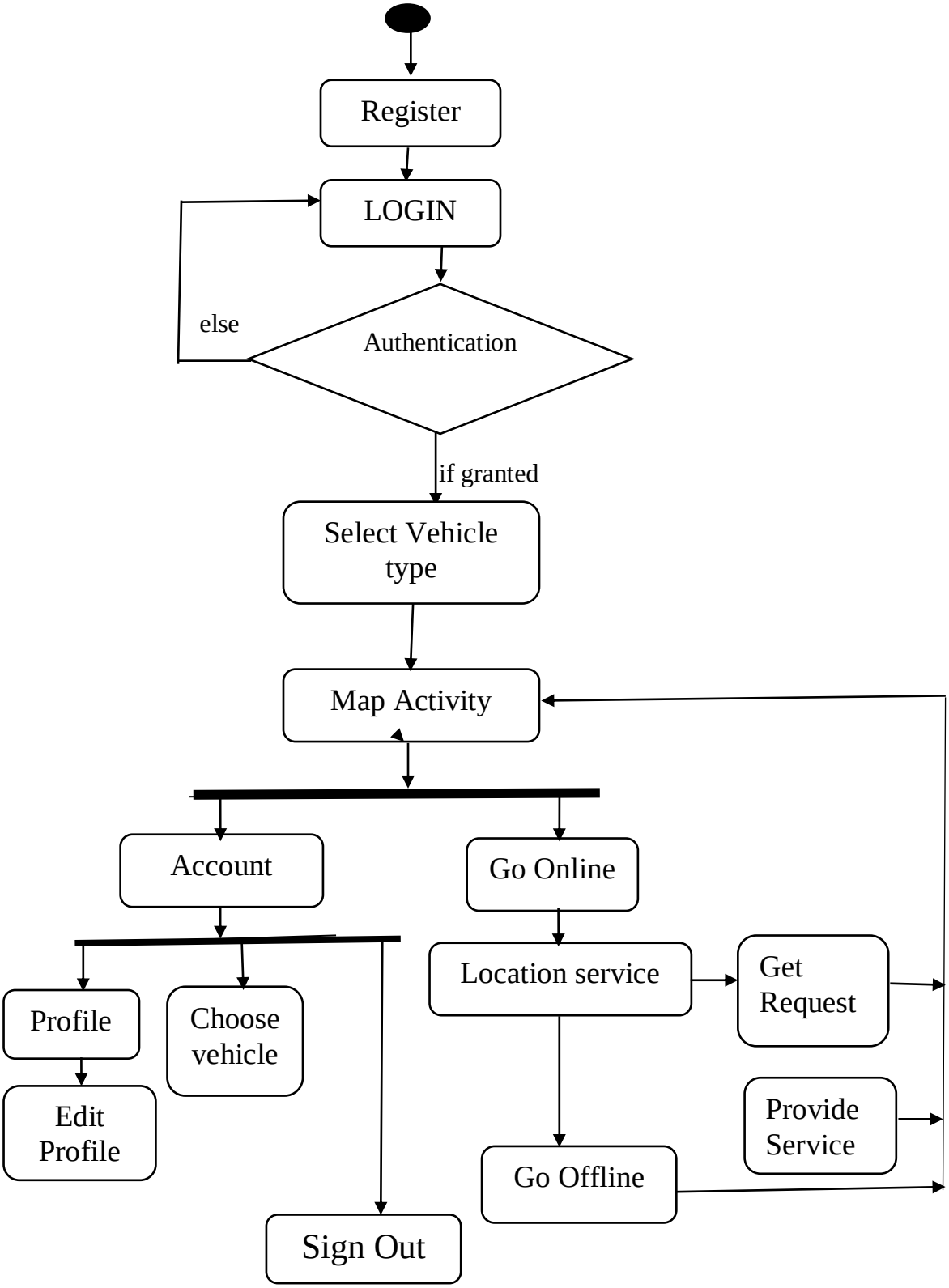

Fig.5.7Mechanic Activity diagram

5.5 Database Design

A Database management Systems (DBMS) consists of a collection of interrelated data and a state of programs to access those data. The collection of data, usually referred to as the database, contains information one particular enterprise. The primary goal of a Database is to provide an environment that is both convenient and effective to use in retrieving and storing database information.

5.5.1 ER diagram

Entity Relationship Diagram depicts the various relationships among entities, considering each objective as entity. Entity relationships are described by their dependence on each other, as well as the extent of the relationship between the data stores. It depicts the relationship between data objects. The ER diagram is a notation that is used to conduct the data modeling activity.

ER diagram:

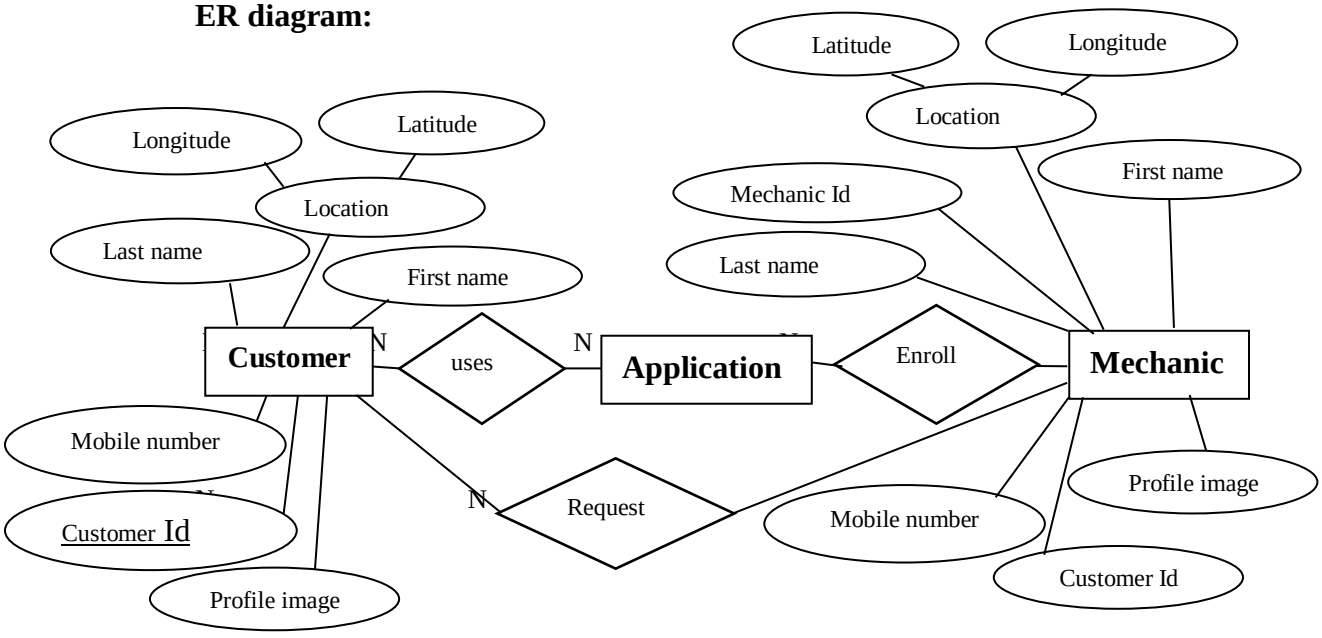

Fig.5.8 ER diagram

6. IMPLEMENTATION

Implementation is the way toward changing over another or a modified system structure into an operational one. The goal is to put the new or overhauled system that has been tried into task while holding costs, dangers, and individual disturbance to the base. A basic part of the execution procedure is to guarantee that there will be no disturbing the working of the association. The best strategy for picking up control while embedding any new system is utilize all around arranged test for testing every single new program.

Another factor to be considered in the implementation stage is the obtaining of the equipment and programming. When the product is created for the system and testing is done, it is then the way toward making the recently structured system completely operational and predictable in execution.

Implementation is the most essential stage in accomplishing a fruitful system and giving the client's certainty that the new system is functional and compelling. Execution of a changed application to supplant a current one. This kind of discussion is generally simple to deal with, give there are no real changes in the system.

System Implementation

There are three major types of implementation are there but the following is proposed for the project.

Phase - in method of implementation

In this type of implementation the proposed system is introduced phase-by-phase. This reduces the risk of uncertainty of proposed system.

Each program is tried exclusively at the season of improvement utilizing the information and has confirmed that this program connected together in the manner indicated in the projects particular, the PC framework and its condition is tried as per the general inclination of the client. The system that has been created is acknowledged and turned out to be tasteful for the client. Thus the system will be executed very soon. A basic working method is incorporated with the goal that the client can comprehend the diverse capacities plainly and rapidly.

At first as an initial step the executable type of the application is to be made and stacked in the regular server machine which is available to the whole client and the server is to be associated with a system. The last stage is to report the whole system which gives segments and the working strategies of the system.

Implementation is the way toward changing over another system plan into activity. The stage centers around client preparing, site arrangement and record transformation for introducing a hopeful system. The significant factor that ought to be considered here is that the transformation ought not to disturb the working of the association.

Implementation Methodology of the Project

The project is implemented in modular approach. Each module is coded as per the requirements and tested and this process is iterated till the all the modules have been thoroughly implemented.

MODULES

There are mainly twomodules in “Vehicle Support” System: -

- Customer module
- Mechanic module

Customer module:

Customer module in the system means “Vehicle Service” android application. Through this the users can make request for the service and can find the mechanic nearest to their location.

Mechanic module:

Mechanic module in the system means “Vehicle Mechanic” android application. Through this application a mechanic can get service request and provide services to the customer by reaching the customer location.

6.1 Screen Shots

"Vehicle Mechanic" application

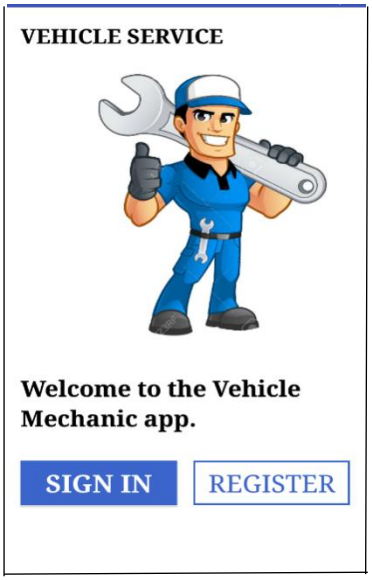

Fig.6.1 Starting page

Fig 6.1 shows the starting page of the "Vehicle Mechanic" application. Here user can select their option.

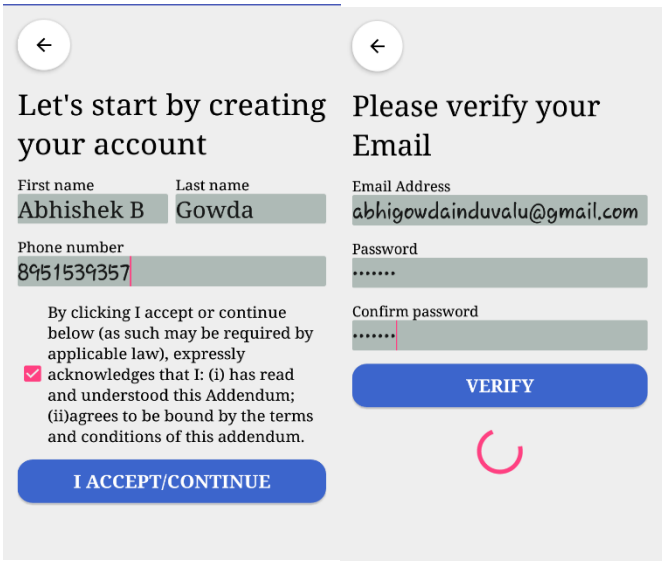

Fig.6.2 Registration page 1 Fig.6.3 Registration page 2

Fig.6.2 and Fig.6.3 shows the registration pages, in which the first page verifies the phone number and second page verifies the email address of the Mechanic.

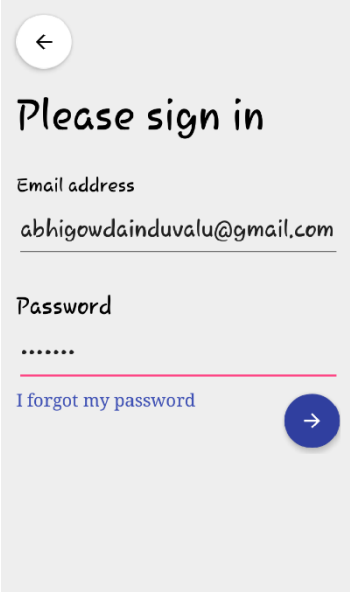

Fig.6.4 Login page

Fig.6.4 shows login page, in which user need to enter the registered email address and password to login to the account.

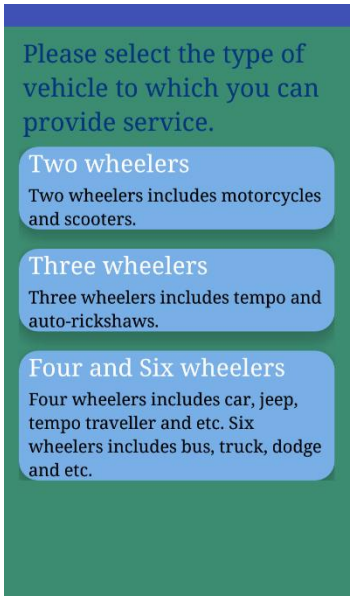

Fig.6.5 Vehicle selection page

Fig.6.5 is the page in which mechanic can select a type of vehicle to which he can provide services.

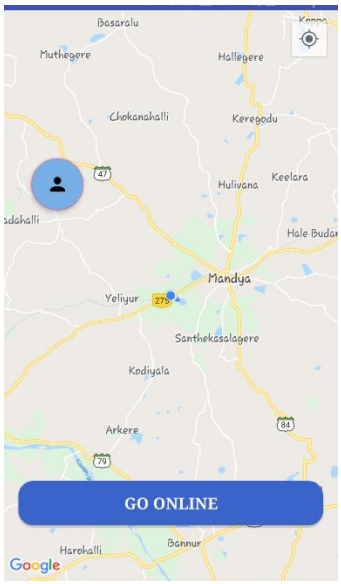

Fig.6.6 Map activity page

Fig 6.6 is a map page in which user can go to his account and can change from Online mode to Offline mode and vice versa.

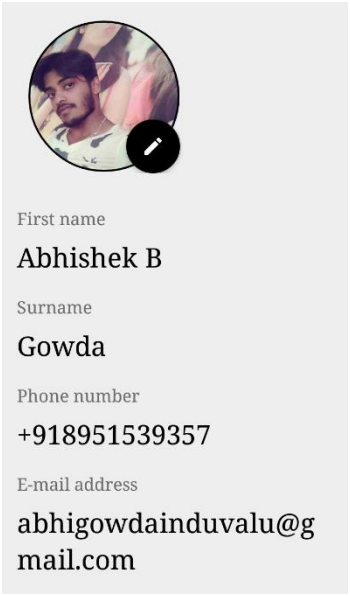

Fig.6.7 Edit profile page

Fig 6.8 shows a page where mechanic can edit his details and can update his profile picture.

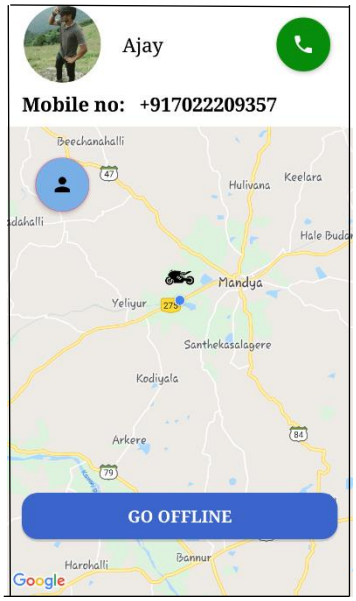

Fig.6.8Map page with customer request

Fig 6.9 is a map page with a service request for two wheeler. In the above figure we can see customer details, both the mechanic and customer location with dark blue dot and a bike respectively.

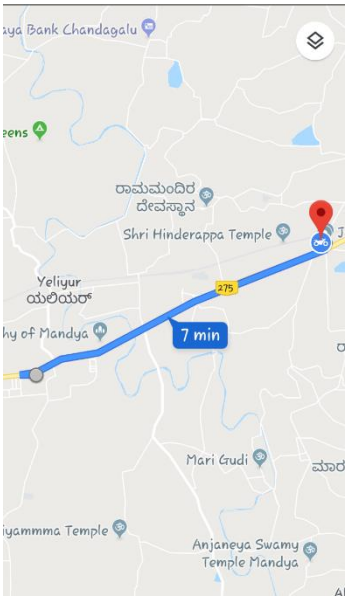

Fig.6.9 Map with direction from mechanic to customer

Fig 6.10 is a map with direction from mechanic to customer with approximate time to reach the location.

“Vehicle Service” application

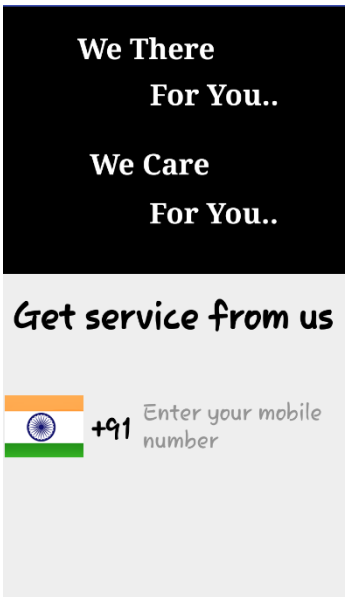

Fig.6.10Starting page

Fig 6.11 shows a starting page of “Vehicle Service” application where it asks user to enter mobile number for verification.

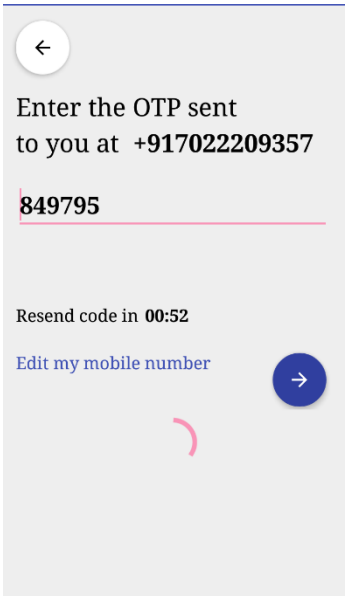

Fig.6.11Verification Page

Fig 6.12 shows a page where user mobile number is verified by sending OTP to the entered mobile number

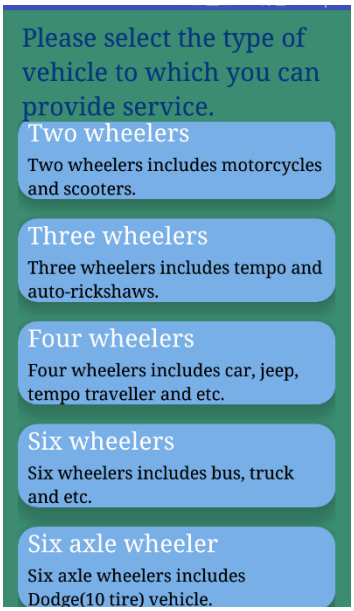

Fig.6.12 Vehicle selection page

Fig 6.13 is a page where user needs to select type of vehicle for which the user needs service.

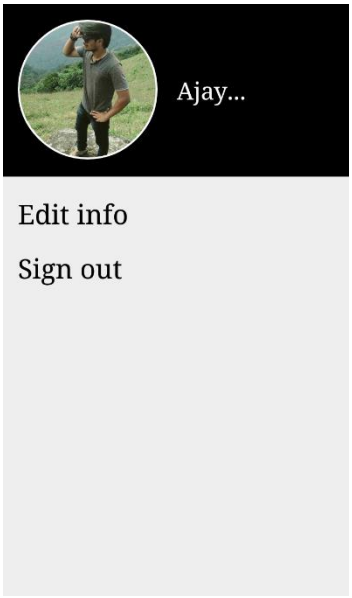

Fig.6.13 customer account page

Fig 6.14 is customer account page where the customer can select edit info option or can logout from the account.

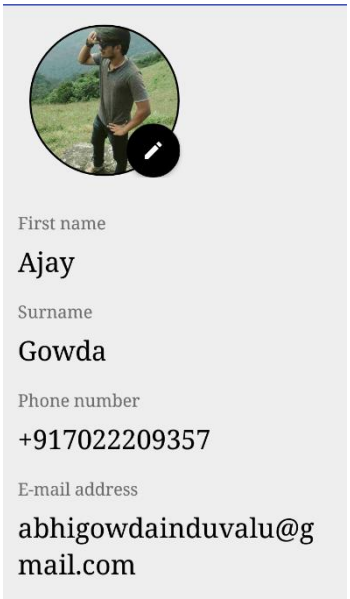

Fig.6.14 Edit profile page

Fig 6.14 shows a page where customer can edit his details and can update his profile picture.

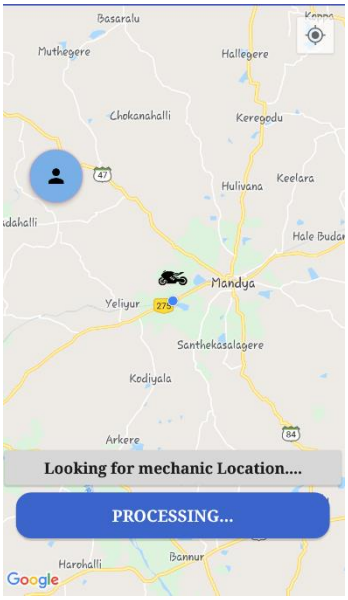

Fig.6.15 Request page

Fig 6.16 is map page which show a message and current location of the customer after the customer request for service to the vehicle.

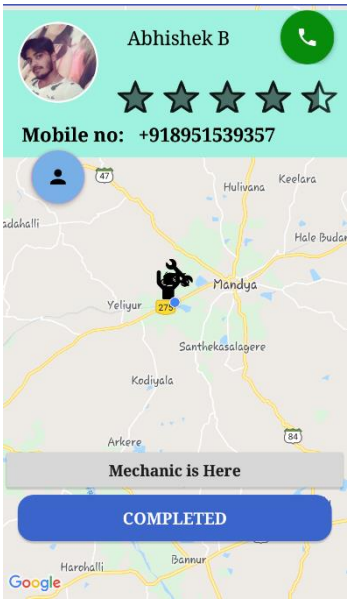

Fig.6.16Map page after mechanic found.

Fig 6.17 is a map page, which shows the mechanic details with rating, location of mechanic and the customer with mechanic symbol and vehicle symbol respectively.

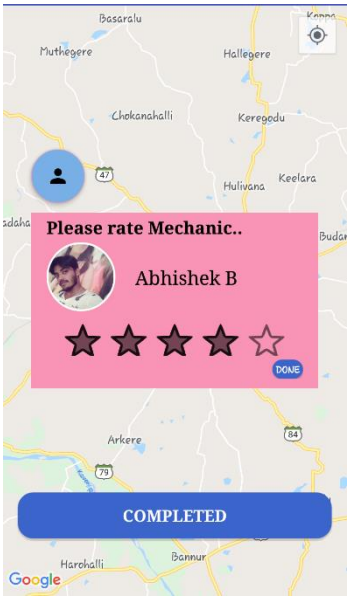

Fig.6.17 Rating page.

Fig 6.17 shows a rating page where customer need to provide rating to the mechanic.

7. SOFTWARE TESTING

Testing is the real procedure associated with programming quality assurance (QA). It is iterative procedure. Here test information is arranged and is utilized to test the modules separately. System testing ensures that all parts of the system work legitimately as a unit by really constraining the system to fall flat.

The experiments ought to be arranged before testing starts. At that point as the testing advances, testing shifts center trying to discover blunders in coordinated groups of modules and in the whole system. The reasoning behind testing is to discover blunders. As a matter of fact testing is the bequest of usage that is gone for guaranteeing that the system works really and effectively before execution.

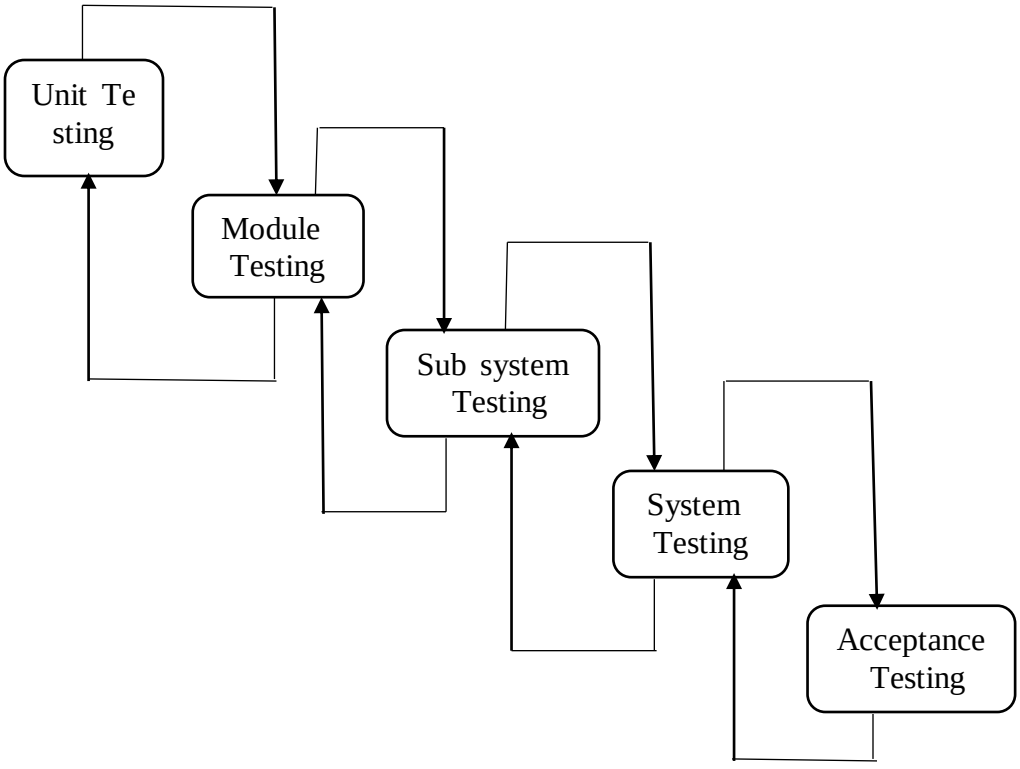

Fig.7.1 Testing process

The various types of testing done on the system are:

- Unit Testing
- Integration Testing
- Validation Testing
- System Testing
- Acceptance Testing

Each module is tested for correctness whether it is meeting all the expected results.Condition loops in the code are properly terminated so that they don't enter into an infinite loop. Proper validations are done so as to avoid any errors related to data entry from user.

Test Cases

TestCase Number	Testing Scenario	Expected Result	Actual Result	Result
	Testing for "Vehicle Mechanic" Application			
	Registration Testing			
TC – 01	Internet connect lost at any stage throughout the process.	"Something went wrong." Message should display.	"Something went wrong." Message is displayed.	Pass
TC – 02	Clicking "Accept/Continue" without entering all fields.	"Please fill all the fields." Message should display.	"Please fill all the fields." Message is displayed.	Pass
TC – 02	Entering invalid mobile number.	"Enter valid phone number." Message should display.	"Enter valid phone number." Message is displayed.	Pass

TC – 04	Verification code not received within given time.	"Did you entered the correct mobile number?" Message should display.	"Did you entered the correct mobile number?" Message is displayed.	Pass
TC – 05	Mismatch between password and confirm password fields.	"Password not matched." Message should display.	"Password not matched." Message is displayed.	Pass
TC – 06	When all the fields are entered with the valid values and click on register	Mechanic should registered and all the details should be stored in database	Mechanic is registered and all the details are stored in database	
	Login Testing			
TC – 07	Clicking submit without entering login details	"Please enter the fields." Message should display.	"Please enter the fields." Message is displayed.	Pass
TC – 08	Trying to login without click on the link sent to the email address given during registration.	"Please check your email for verification link." Message should display.	"Please check your email for verification link." Message is displayed.	Pass
TC – 09	Trying to login with invalid email Id and password	“Please register if you are not yet registered.” Message should display.	“Please register if you are not yet registered.” Message is displayed.	Pass

TC – 10	Trying to login with valid email address and password after clicking on the verification link sent to the email address given during registration.	Should go to the vehicle selection activity.	Gone to vehicle selection activity	Pass
	Testing for "Vehicle Service" Application			
	Registration and Login Testing			
TC – 10	Clicking next without entering mobile number.	"Enter valid phone number." Message should display.	"Enter valid phone number." Message is displayed.	Pass
TC – 10	Entering invalid mobile number.	"Enter valid phone number." Message should display.	"Enter valid phone number." Message is displayed.	Pass
TC – 11	Verification code not received within given time.	"Did you entered the correct mobile number?" Message should display.	"Did you entered the correct mobile number?" Message is displayed.	Pass
TC – 12	If Verification is successful.	Should go to Vehicle selection activity.	Gone to vehicle selection activity.	Pass

7.1 Test case table

8. CONCLUSION

"Vehicle Support" system contains android applications made on java stage and comprises of two android applications, in particular Vehicle Service and Vehicle Mechanic.

The "Vehicle Service" android application will gives a fair User Interface to the customers who are need of organization to their vehicle and to get the administration from the Mechanic nearest their territory.

The "Vehicle Mechanic" is an android application and particularly for Mechanics to offer administration to nearest customer who need administration.

By utilizing the system client can decrease the time and exertion to locate the repairman and a technician can improve his business by making himself available at the client's area.

9. FUTURE ENHANCEMENT

In future the system can be extended by adding modules like medical, food and so forth, for providing services like medical emergency and food supply etc. So that by adding these module the system will become more useful and by using the system the peoples can reduce their time and effort.

APPENDIX A

BIBLIOGRAPHY

❖ **Reference websites**

- https://developer.android.com/docs
- www.stackoverflow.com
- https://www.youtube.com/watch?v=c-7sW6UJHw0
- https://developer.android.com/training/location
- https://developer.android.com/guide/topics/location
- https://www.tutorialspoint.com/android/android_location_based_services.htm
- https://blog.teamtreehouse.com/beginners-guide-location-android
- https://firebase.google.com/docs/auth/android/phone-auth etc.

❖ **Reference Books**

- "Professional Mobile Application Development" by Jeff McWherter and Scott Gowell.
- "Beginning Android Application Development" by Wei-Meng Lee.

APPENDIX B

USER MANUAL

Vehicle Mechanic Application

After installation process completed,

- Since the application making use of real time data the user need to be connected to the internet.
- Mechanic should register to the system by providing information's like first name, last name and mobile number (the number should be currently used by the mechanic because it will be verified by sending OTP).
- After the mobile number verification, it will go to the second stage of the registration, in which user needs to enter his Email Id and password for his "Vehicle Mechanic" account.
- To login to the account, user needs to click on the verification link first, which is sent to the email address which is given during registration, then the user can login to the account, otherwise not possible.
- After login to the account, mechanic can edit his profile.
- A button will be available to change his status or working mode. When he click on the button his working mode changes from OFFLINE to ONLINE and he will receive request for services. If the working mode is OFFLINE he won't receive any request for service.
- Once there is a request for service, he can see the customer location and direction to the customer location.
- The mechanic can view the details of the
- Thus the mechanic will reach the customer location and provide service.
- Mechanic can't change from ONLINE to OFFLINE mode when he is working and he can sign out only when the mechanic is in OFFLINE mode.

Vehicle Service Application

After installation process completed,

- Since the application utilizing continuous information the client should be associated with the web.
- Both the registration and login process are same for this application.
- The customer need to provide his first name, last name and mobile number (the number should be currently used by the mechanic because it will be verified by sending OTP) to register to the application.
- After the mobile number verification, it will leads to select type of vehicle to which he needs administration.
- After vehicle selection, map activity will open where the customer can request for service by clicking on REQUEST button. After the request, the application will find a mechanic who is nearest to customer location and he can view the mechanic location.
- After the mechanic was found, he can view mechanic details.
- Once the mechanic reach the customer location and provides service, he should click on COMPLETED button and should rate the Mechanic.