

**CONSTRUCTION HUB AN ANDROID APPLICATION FOR  
CONSTRUCTION SERVICE**

**By**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering.

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**MAY 2019**

## APPROVAL

This Project titled “CONSTRUCTION HUB AN ANDROID APPLICATION FOR CONSTRUCTION SERVICE”, submitted by Shaon Singha, ID: 151-15-5481 and Monjur Amhed, ID: 151-15-4701 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree B.Sc in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 04<sup>th</sup> April 2019.

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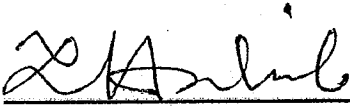
  
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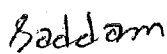
  
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## DECLARATION

We hereby declare that, this project has been done by me under the supervision of **Farah Sharmin, Senior Lecturer, Department of CSE** in Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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## ACKNOWLEDGEMENT

First, we express our heartiest thanks and gratefulness to Almighty Allah for his diving blessings which made us possible to complete this project successfully. We feel grateful to **Farah Sharmin, Senior Lecturer**, Department of CSE, Daffodil International University, and Dhaka and for her continuous support. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Farah Sharmin, Senior Lecturer Department** of CSE, **Professor Dr. Syed Akhter Hossain**, Head, and Department CSE Daffodil International University. For their kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank my entire course mate in Daffodil International University, who took part in this discussion while completing the project work.

Finally, we must acknowledge for their constant support and love of my parents.

## **ABSTRACT**

Now a day's mobile application has become an integral part of our daily life. From grocery to medical assistance everything can be managed through smart phone and its various apps. We aimed in our project to build an app for construction site. Different stakeholders can communicate with in this app and sell their product and services. Live chat among builders, workers and individuals is one of its highlighted features. Ratings can make users pick their desired products or services easily. From bricks to paint from cement to legal and from electrician to plumber everything can be available in this app.

We have used Android Studio, XML, JAVA and firebase to implement the functionality. It can be used widely used in construction business in near future.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Our project is based on online Android Application on construction related for different kind of stockholders in construction sector. In a word, our App is all about construction materials buy and sell point. Where construction or the service provider can create their ads and user can simply or easily chose and buy their product from this Application. Different kind of stake holders can easily live conversation between them by a good authentication dealing process. It is very important for them to product buy or sell. User can easily signup the process by login and see the product list service list and can easily order their necessary things by this system of application. it is very much user friendly and reliability thus the different kind of stack holders related construction sector are must be benefited. This application is very much easy virtual communication for the construction site. People who have need to build house not to go outside for construction product or construction related services. They can get every single construction product pricelist and construction services company around to see here.

### 1.2 Motivation of Work

The Motivation of our project is to developing construction dealing system more between reliable and which helpful to the builder's company's product seller and buyer. It is more helpful for Builders Company and who are willing to build a building these they can easily get their product list and those product list price from this android application. A reliable business communication between two users by live chatting system.

Thus, they are benefited from this app.

### **1.3 Objectives:**

The main objective of our project to help seller and buyer related to the construction sector.

- It's an online Based virtual communication process.
- It's an online system so that user can use it easily, others reducing waste of time.
- It connected with stakeholders for the construction builder's purpose.
- It produces good security for the stakeholders into the construction services.
- It produce knowledge in construction engineering.
- It provide developer information in bd.

### **1.4 Expected Outcome**

- Product list like: 1.Product related. Exp: Bricks, steel 2. Construction services related. Exp: 1.sheal private ltd. 2. M.A. builder ltd.
- Pricing Product policy.
- Feedback system.
- Conversation (chat) system between different stakeholders.
- Authentication process between seller and buyer.
- Positive information can easily see buyer.
- Lot of data entry system.
- Security and integrity.

## 1.5 Report Layout

In this report, we have arranged other parts of the report in this following way. In chapter 2 we will keep the discussion about the background of this service, related work and comparative studies, problems that may arise and challenges of this project. Then in next chapter we will discuss about requirement specifications including business process modeling, requirement collection and analysis and use of case modeling and description.

We will also discuss about logical data model and design requirements in this chapter. Then we will discuss about system architecture, database design, UI design and UX and also discussed about implemented requirements in chapter 4 named design specification. Implementation and front-end design and implementation of interaction along with testing implementation and test results and reports will be discussed under the name of Implementation and Testing in chapter 5. In chapter 6 the conclusion will be done by discussing discussion and conclusion and scope for further developments.

References and appendices will be given later on under the title of appendix A: project reflection,

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

Constructor Hub is basically online based android app. The background of our project is done by android studio. Android studio is the official integrated development environment process. Build on JetBrains's IntelliJ IDEA software. It is reliable for download on Windows, macOS and Linux OS. We also use Firebase for Database management system. We use it for chat from real-time database. Authentication app post etc.

#### **2.2 Related Works**

There has been a couple of works in the past. For example, there are some applications named.

##### **2.2.1 Construction Material Estimate**

The Application is made for one thing in mind. Make your life simpler specifically when it comes to estimating/calculating construction materials like. Bricks, Blocks, Thermistor, Plaster, Cement, Sand, Gravel, Water-Base, Oil-Base, Concrete Tile, Tile....etc. The App. is easy to use. I am sure you will enjoy the app[11]

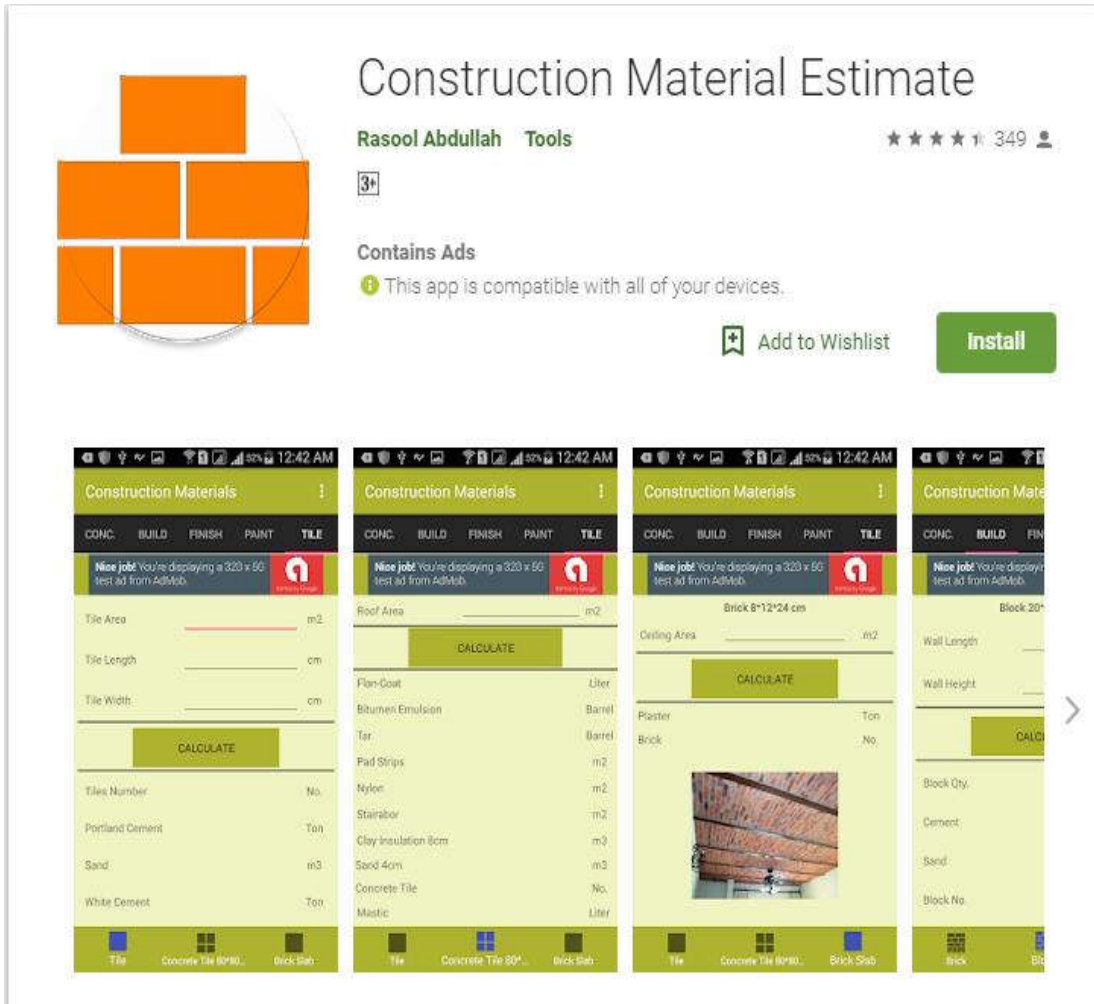


Figure 2.1: Construction material Estimate

### 2.2.2 Construction Notes

A Tool for Construction Field Person. This application will manage all your record at a one place. Features:

- Tracks multiple records
- One Projects with multiple report like material expense, labor expense[12]

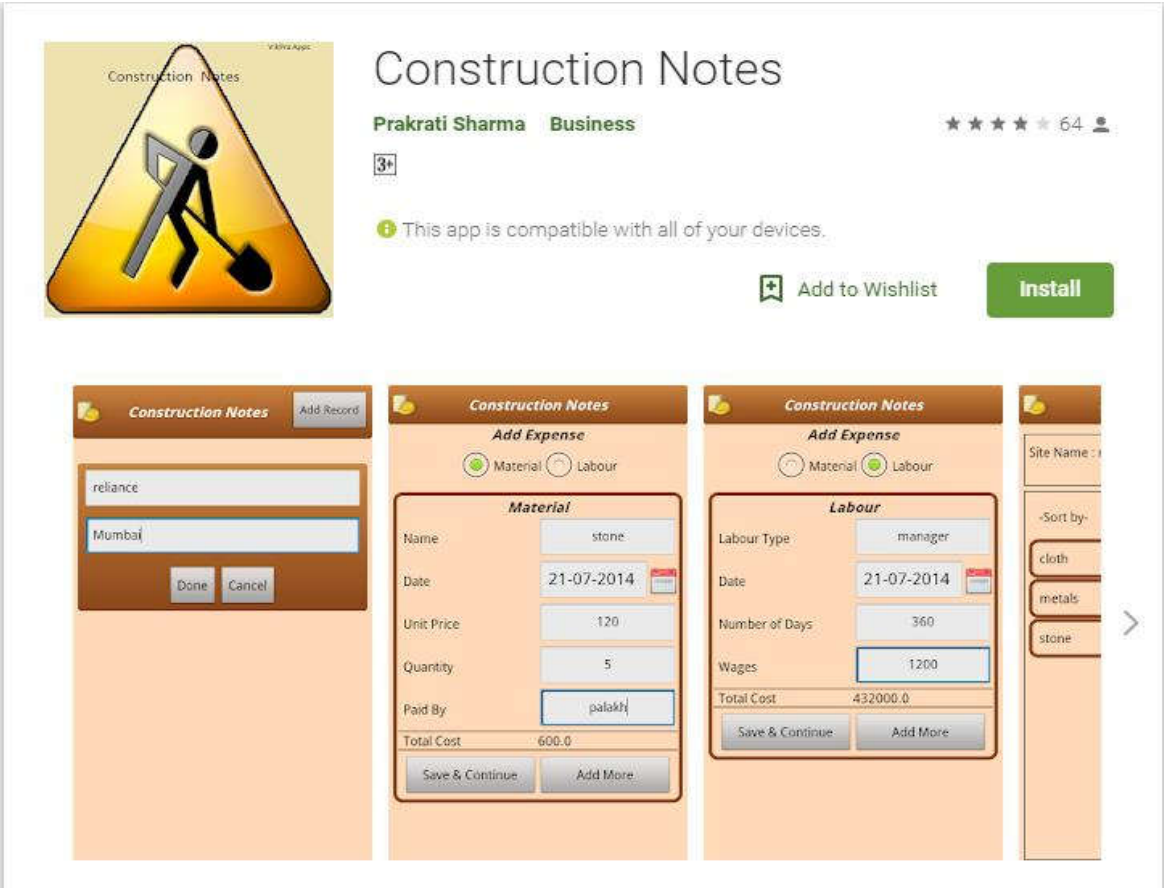


Figure 2.2: Construction Notes



### 2.2.3 Construction Calculator (Concrete, Steel, Bricks etc)

Construction calculator is a Calculating platform for all the civil Engineers and Construction Workers around the world. Calculate Concrete, Bricks, Steel, Blocks, Tiles and Area etc. All in one[13]

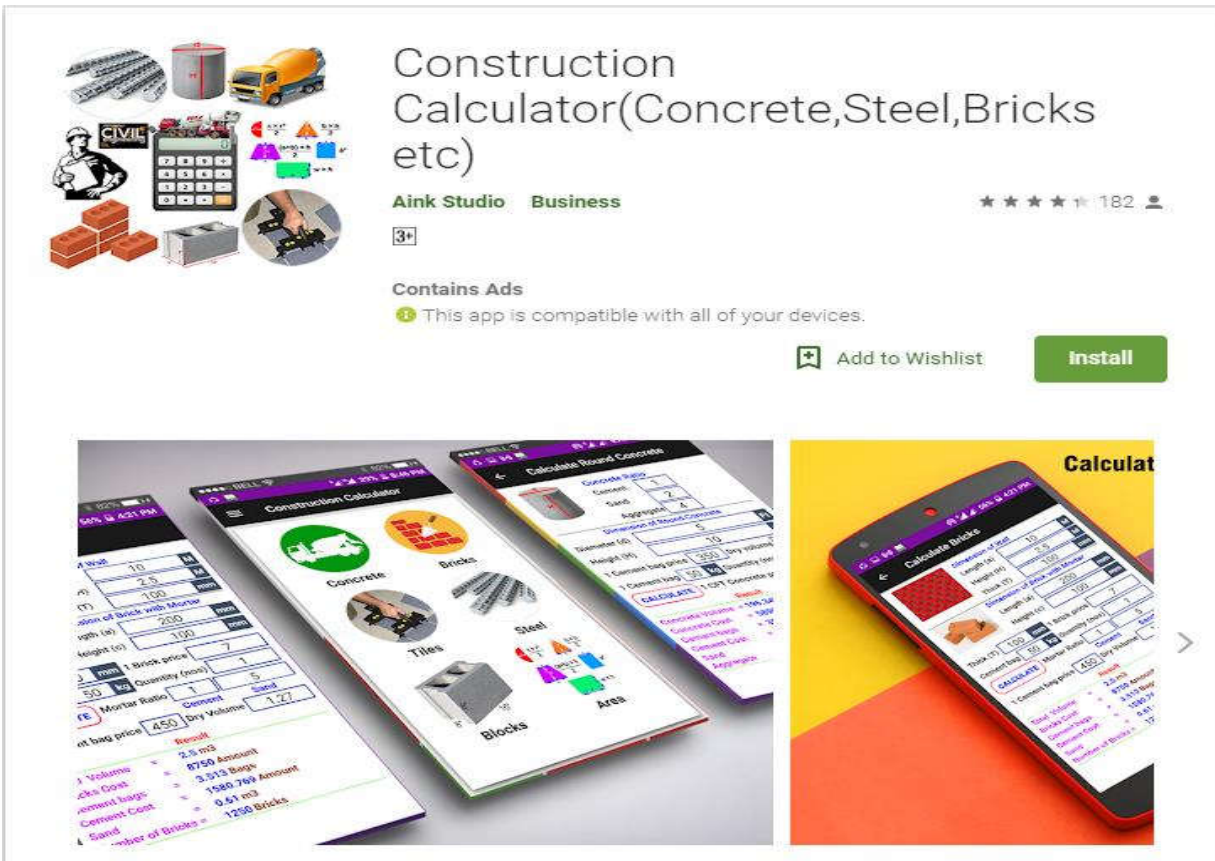


Figure 2.3: Construction Calculator (Concrete, Steel, Bricks etc)

## 2.3 Comparative Studies

There are some existing application which have some limitations. Most of the applications have some problem. Different applications contain different features but there is no app which contain all features in one application

We basically make these app for construction site people who buy and sell offline to online process for business purpose. So, lots of social activity and combine with android study work system and user login process and seller post product list on to the site and buyer get is to login process. We describe about app works: When open the app firstly sign up with user id, contact number, user name, and mail. Then check all sector of product list. It is like social but virtual sector all the data become safe. When we enter the app by user name, email.

## 2.4 Scope of the Problem

Live chat is more difficult part when we prepared our application. It was very difficult to complete the task on that time and we faced lots of problem arising part by part. User push message on to server and destination pulled it from server was more difficulties and second time we faced problem database management system. When we connect firebase on database. It is free online so that is save 100 users almost. But limitation is one of the major problems for us.

We work analytical site almost two months layout of the project one month.

Coding four month and verification and error detection time was one month.

In total seven month we expand for the project prepaying.

## 2.5 Challenges

**Interactive Application:** One important thing in a software project is its Interactions. Mobile devices offer many high-quality features with high quality sensors. So, creating interactions is time consuming and can be very complex in design phase.

**Keeping the Application simple and clear:** If the app is very complex and user cannot recognize how it works, then the user will be frustrated and will give a negative review about the application.

So the functions of the app should be very clear.

**Mobile Content Management:** The importance of mobile application content is growing day by day because increasing number of smart phone. So, including rich content such as images, animations is important. On the other hand, in our app such functions like as attendance, results are important.

**Dealing with the different screen devices:** Users may have many different screen devices. So our challenge is to handle the design of the application as it may vary for different devices.

**Maintaining the connection with the user:** Mobile application market is dynamic because of high number of innovations. So connection with the users is very important.

**Performance:** One of the important challenge is to design well performing and bug free application which needs minimum charge of battery.

Real time searching and firebase database system are the difficult task for the implementation. Enter into the product list, feedback process, user id, login part for buyer and seller are differentiate is very difficult for me. Here I faced lots of problem because our team member are not well expert for this type of problem arising on to the work station.

- Live chat Real time chatting support system is very difficulties.
- It was very difficulties to maintain time when I prepare app and lots of problem arise and solved, they're on time.
- Different type of problem solve and my supervisor helped difficult task in every season. Reliable communication was needed to finish the app easily without any problem.

## CHAPTER 3

### REQUIREMENT SPECIFICATION

#### 3.1 Business Process Modeling

Business process modeling is the graphical representation of a company's business processes or workflows, as a means of identifying potential improvements. This is usually done through different graphing methods, such as the flowchart, data-flow diagram, etc.

##### 3.1.1 Business Processing Model

We are using agile method as a business processing model of our project for the causes given below: [1]

- Working application is delivered frequently
- Improve Process Communication
- Increase Control and Consistency
- Improve Operational Efficiencies

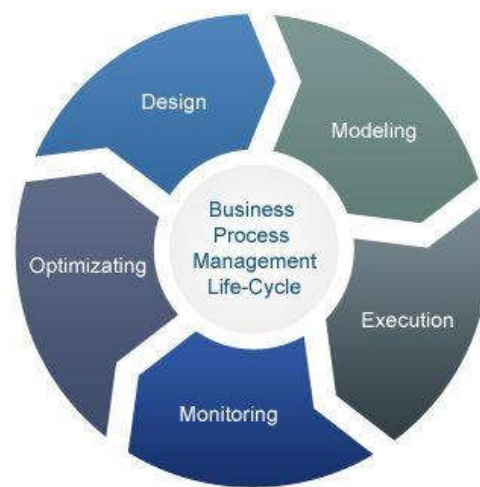


Figure 3.1: Business processing model (agile method)

## **3.2 Requirement Collection & Analysis**

### **3.2.1 Software Requirements:**

- Android Studio IDE
- Android Virtual Device
- Database: Firebase
- Adobe Photoshop

### **3.2.2 Hardware Requirements:**

- Operating system: Windows
- Android supported device
- Computer configuration:
- RAM-8GB (min)
- Hard Disk- 150GB (min)
- Processor- 1.5GHz (min)

### **3.2.3 Non-functional Requirement**

- Help text will be provided in English.
- The process of using the application will always be available.
- There is no user limit for browsing the application.
- This application can be used only on android OS.
- During browsing through the application system responses should be no more than
- Only register user can modify the information of the application.

### 3.3 Use Case Modeling

Use case diagrams are set of actions (use cases) that some system or systems should or can perform in collaboration with one or more external users of the system. Each use case should provide some observable and valuable result to the actors or other stakeholders of the system.

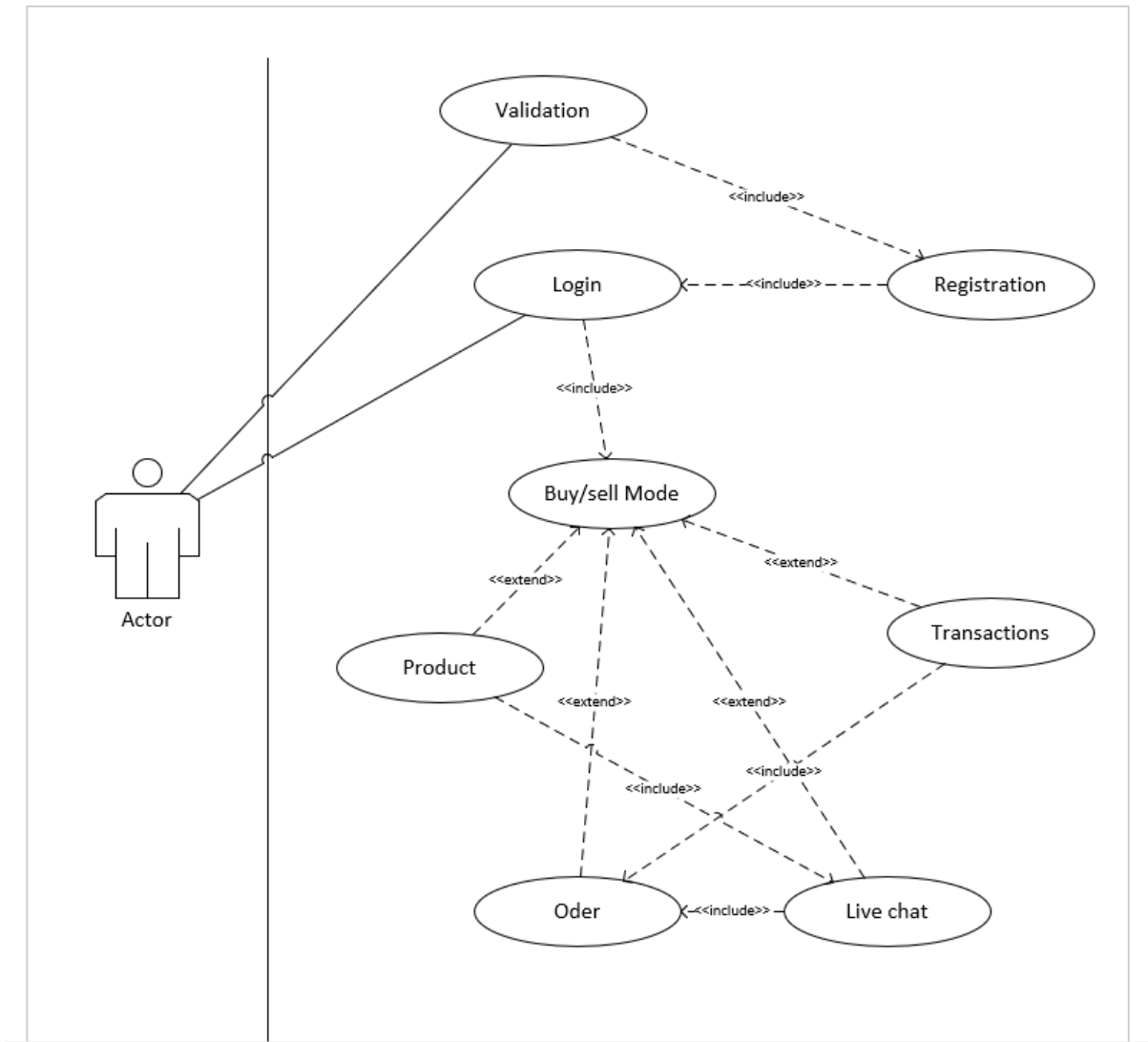


Figure 3.3: Use case diagram

### 3.4 Logical Data Mode

System has Name, location, email id, phone no, enter password and all are connected through 'user' and decision making policy is "use confirm" link with buyer or seller, also feedback is connected with it. And buyer or seller making decision from the total system.

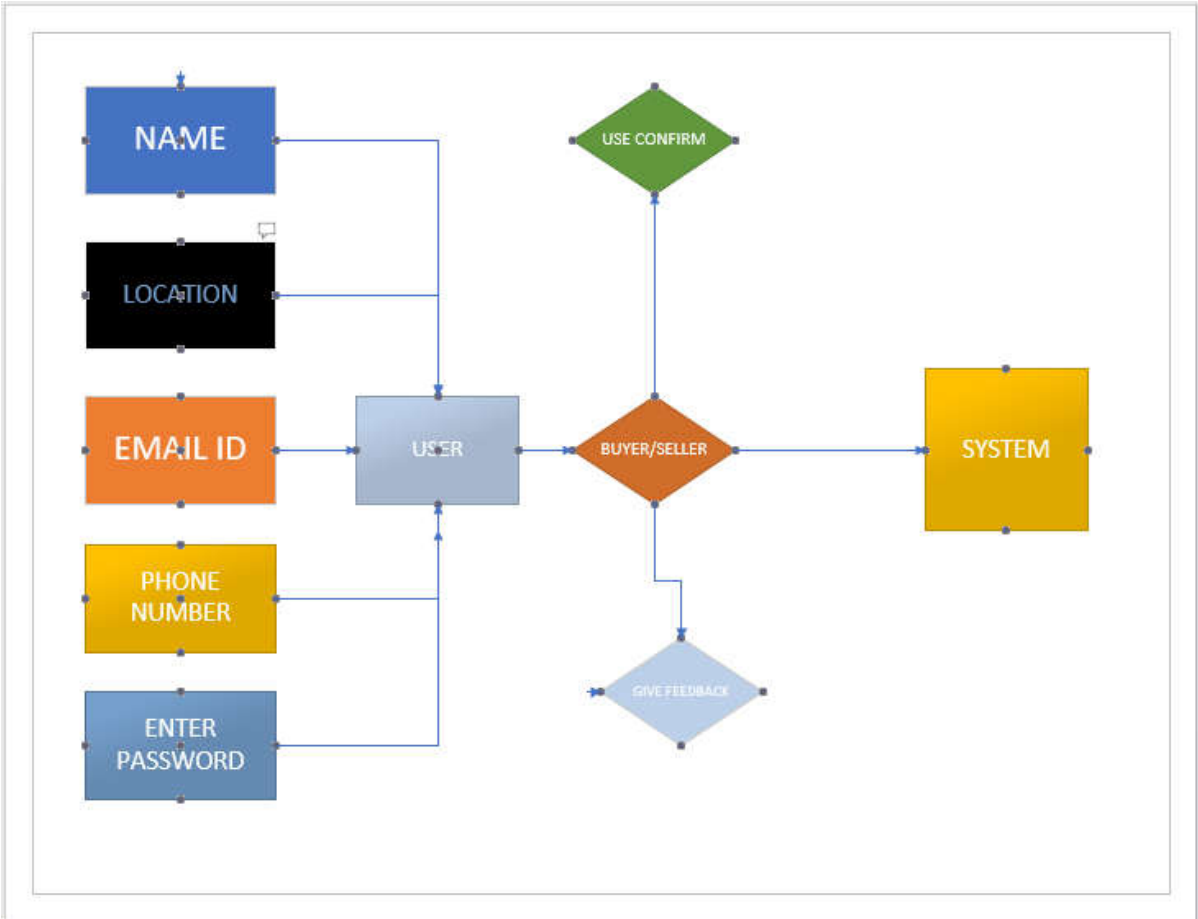


Figure 3.4: E-R Diagram of the Proposed System

### 3.5 FLOWCHART:

Firstly start with the system and data policy made then three process are connected with decision. If decision is yes then enter first process, if no then enter or check the second process and then get third process.

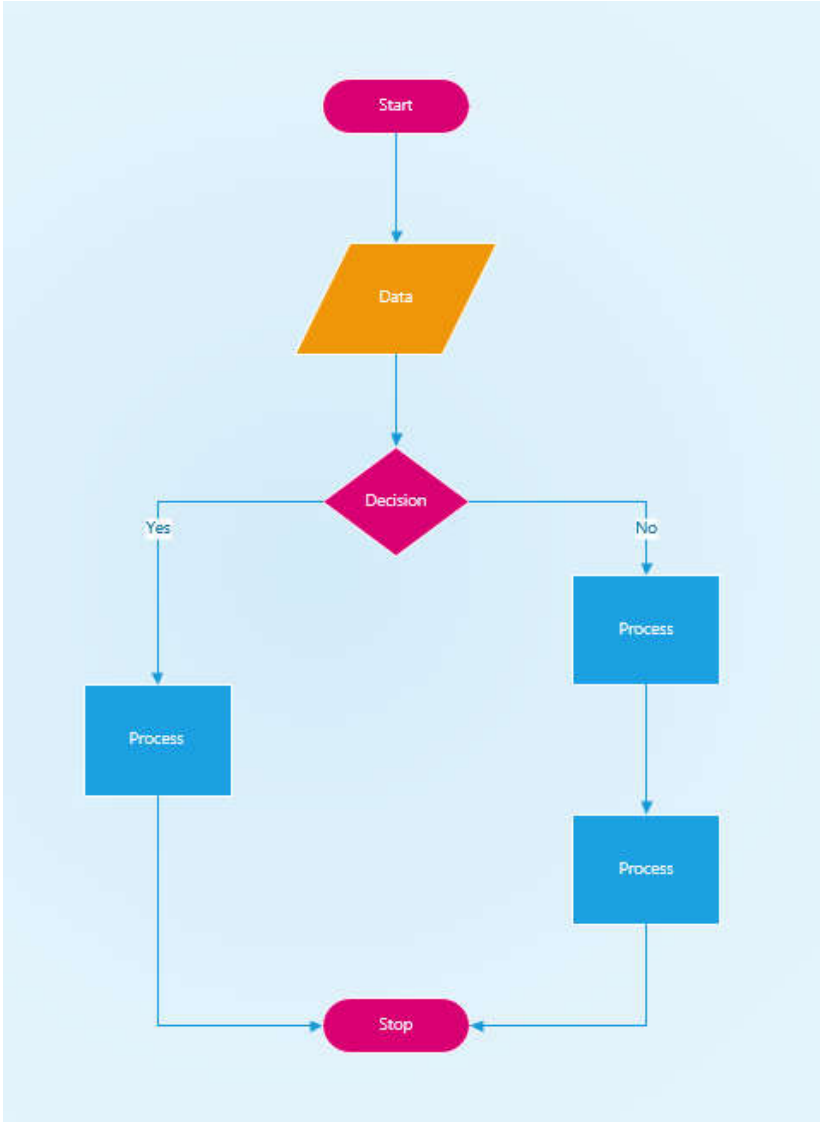


Fig 3.5: Flowchart Diagram



### 3.6 PROCESS WORK:

Firstly account signup then it checked or new register. Register then sign up and register has login and forget part checked. If it forget then correct email wants. Login has two type of buyer and seller.

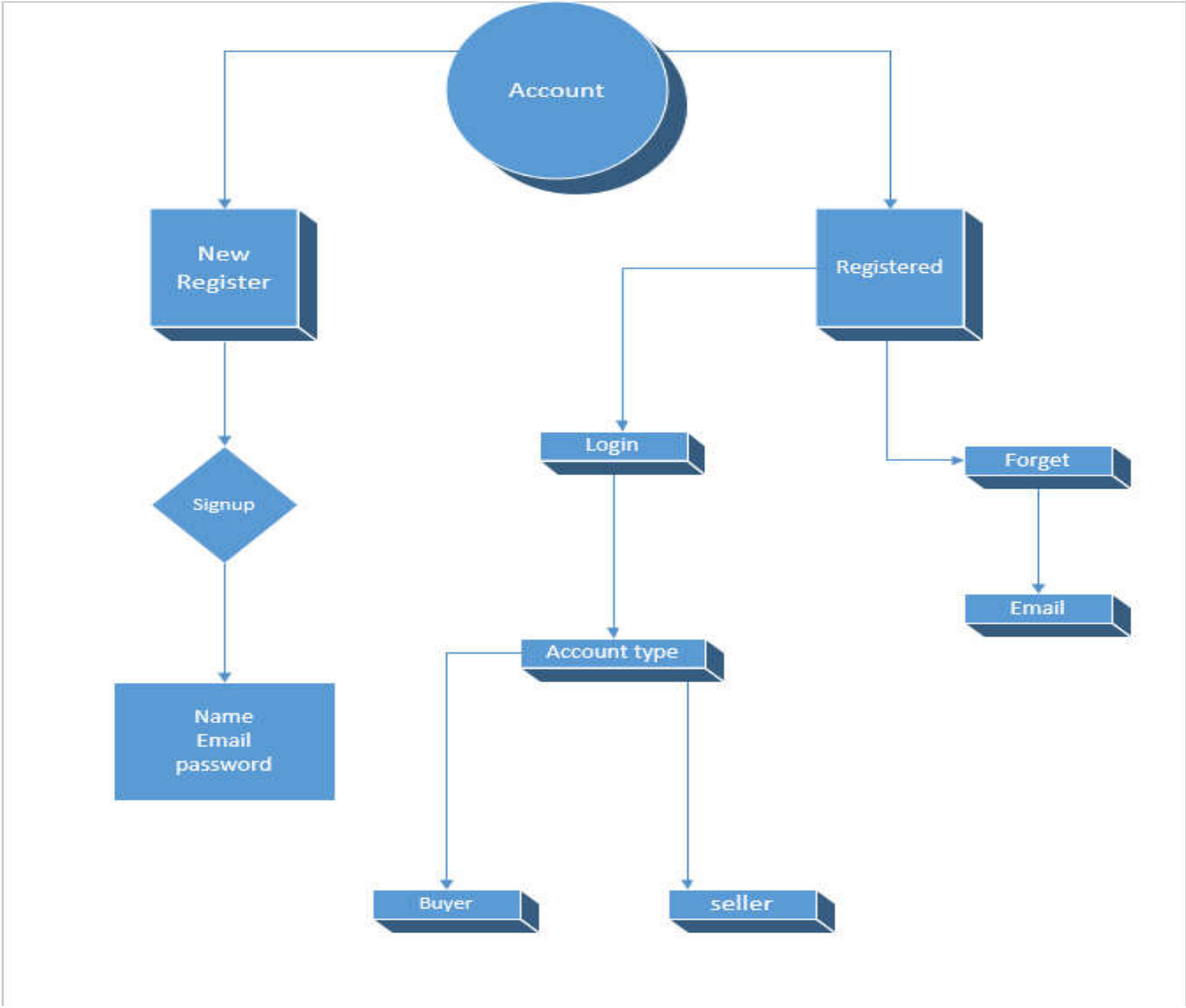


Fig 3.6: Process Work

### **3.7 Design Requirements**

- Help text will be provided in English.
- The process of using the application will always be available.
- There is no user limit for browsing the application.
- This application can be used only on android OS.
- During browsing through the application system responses should be no more than 1 second.
- Only register user can modify the information of the application.

# CHAPTER 4

## DESIGN SPECIFICATION

### 4.1 System Architecture

System architecture shows the structure and behavior of a system, how the system works and how it interacts with users [9]. The following figure 4.1 shows System Architecture.

The Android software stack generally consists of a Linux kernel and a collection of C/C++ libraries that is exposed through an application framework that provides services, and management of the applications and run time.[1]

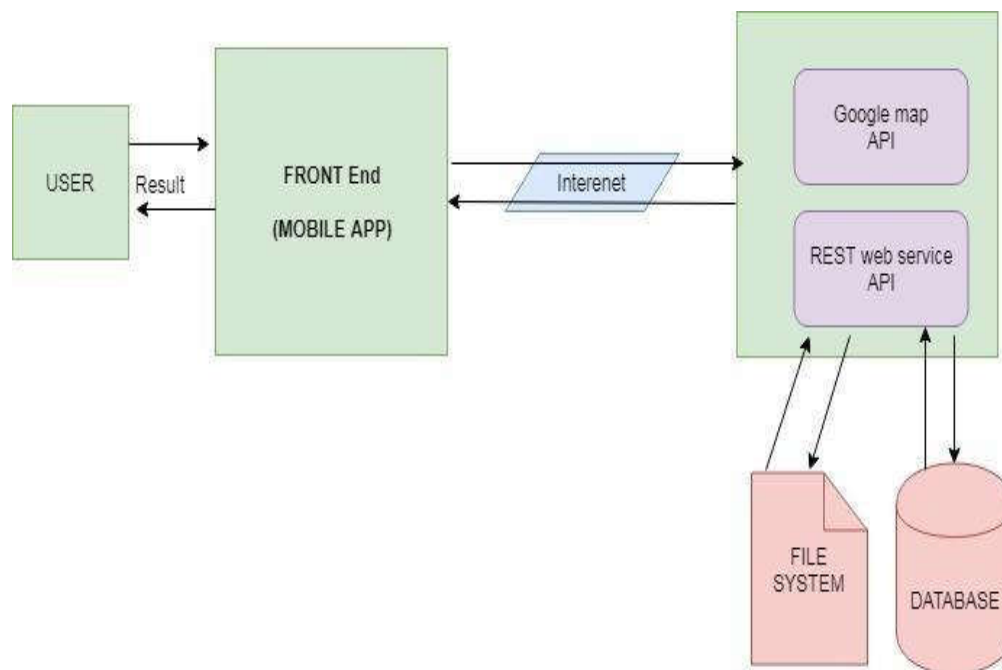


Figure 4.1: System Architecture

## 4.2 Database Design

Database design is a process which can add data or delete data by user .In our developed application we use firebase database to control our data flow. Under below us shows some pictures of our database in figure (4.2), (4.3), (4.4)[3]

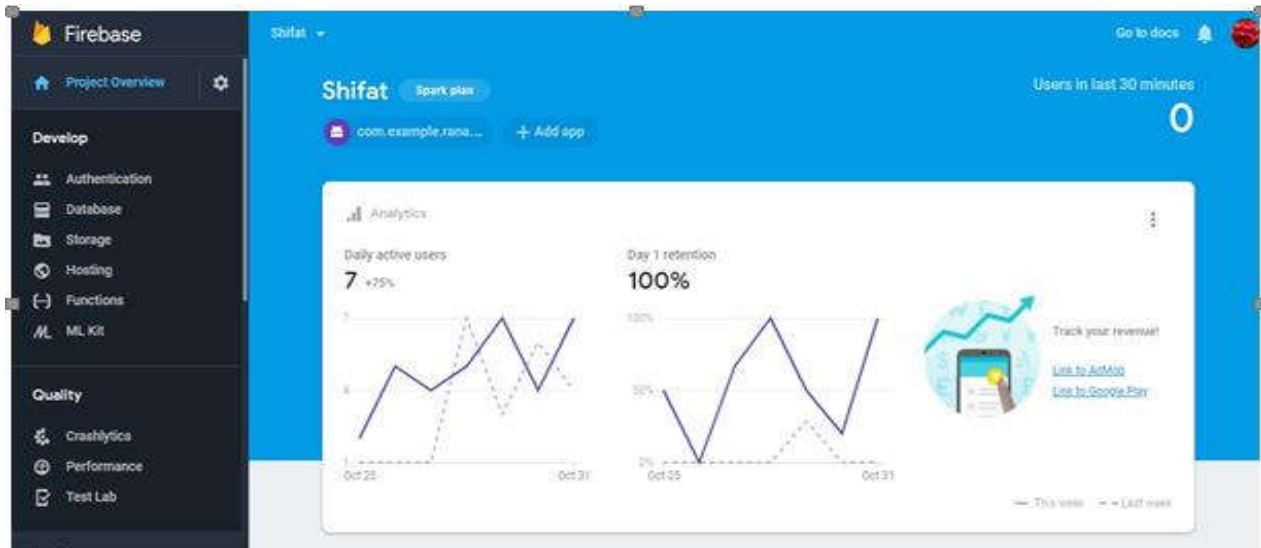


Figure 4.2: Overview of Firebase database

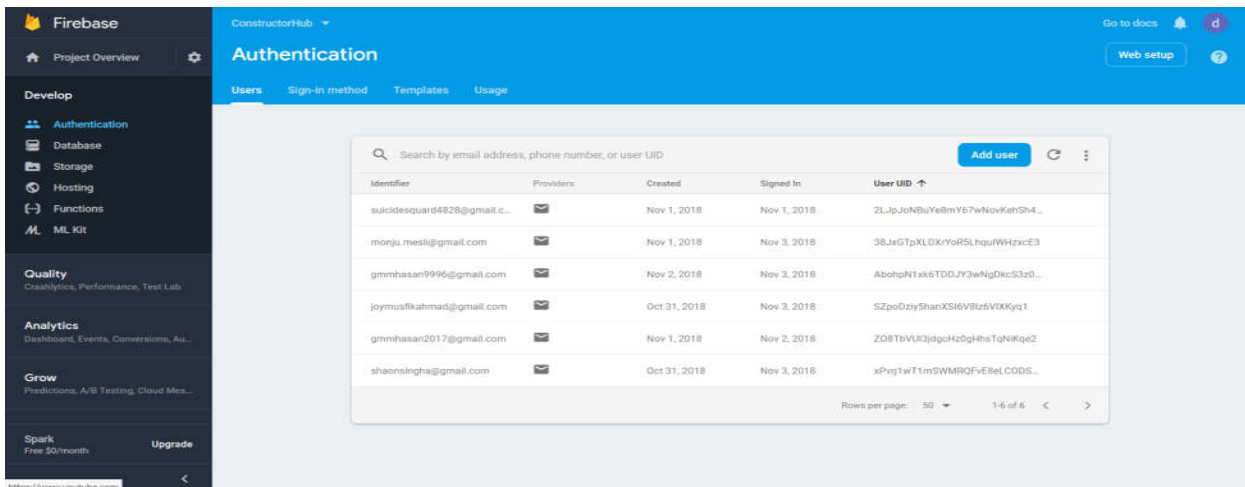


Figure 4.2: Database Design for Android App (Part1)

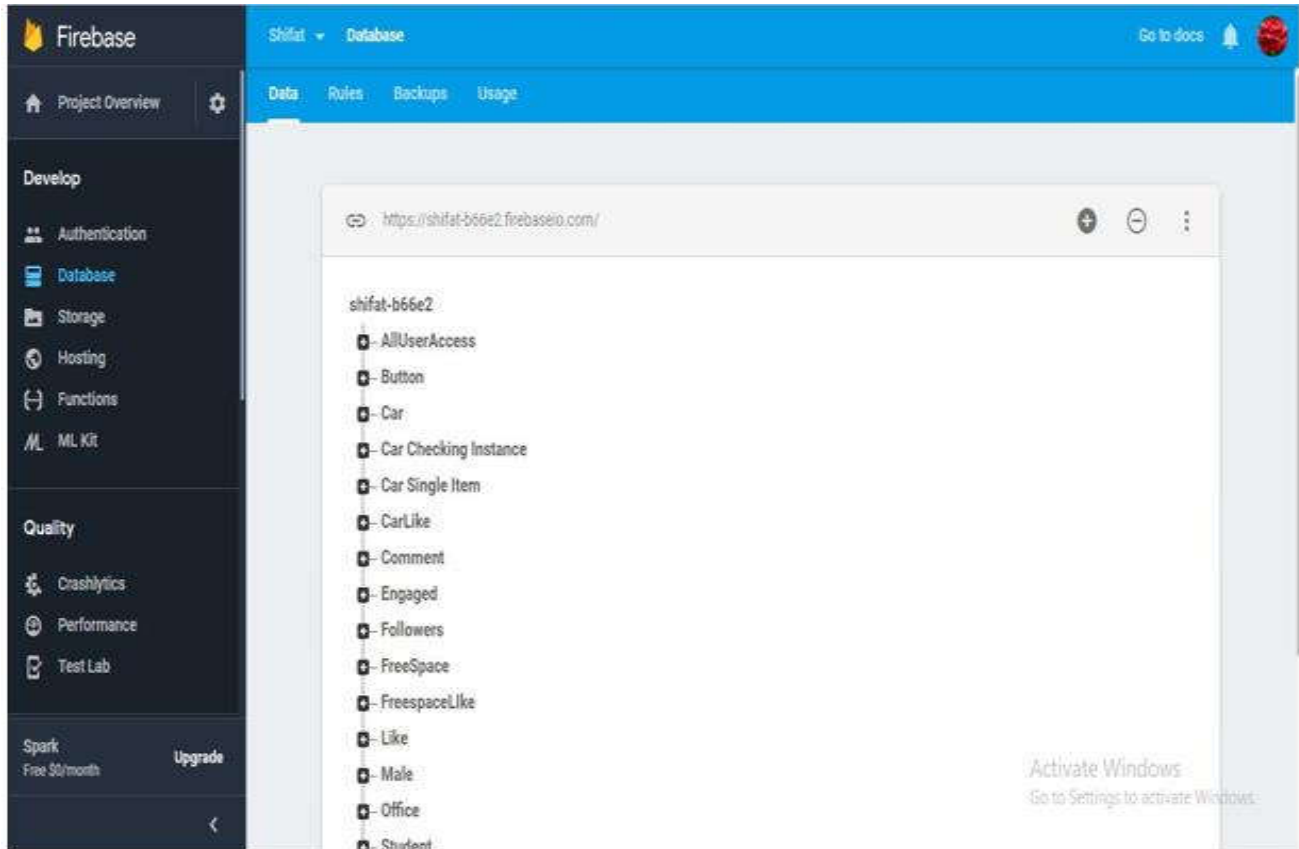


Figure 4.3: Database Design for Android App (Part2)

### 4.3 UI Design

User Interface is use to show the interaction between user and the device. By using graphical user interface (GUI) user can easily operate the system. It helps user to control our app. User can easily operate some other interfaces by using this.

### 4.3.1 User authentication

In this part user can easily enter their “username” and “password” and login here. there are also two parts added here. If user id or pass wrong or something missing of true authentication then the part will be needed Forget password? And user then sign up.

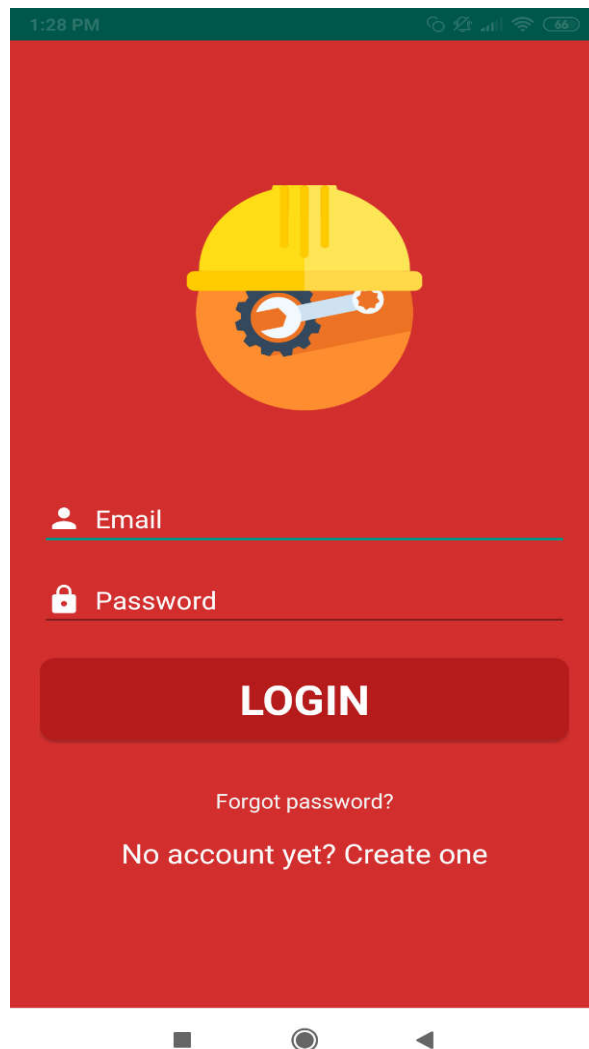
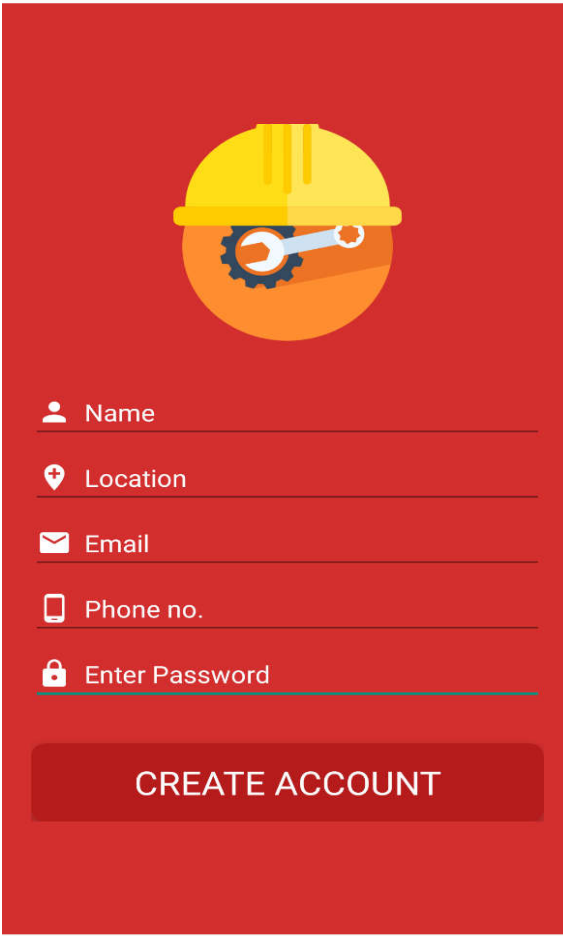


Figure 4.4: User’s data check

### 4.3.2 Signup process

In this part, user enter his/her name, password, email id, phone no, location and enter password which is collected on to the database. Then user sign up for further process.



The image shows a mobile application interface for a sign-up process. The background is a solid red color. At the top center, there is a circular icon with a yellow hard hat, a gear, and a wrench. Below the icon, there are five input fields, each with a small icon to its left and a horizontal line for text entry. The fields are labeled: 'Name' (with a person icon), 'Location' (with a location pin icon), 'Email' (with an envelope icon), 'Phone no.' (with a mobile phone icon), and 'Enter Password' (with a lock icon). Below the input fields is a large, rounded rectangular button with the text 'CREATE ACCOUNT' in white capital letters. At the bottom of the screen, there are three small navigation icons: a square, a circle, and a triangle pointing left.

Figure: 4.5: sign up

### 4.3.3 Log in as user

If user is already having an account, then he will see the log in page directly. After logging in user can do to home page. We use firebase authentication [3] with a scroll view [4] to authenticate email and password.

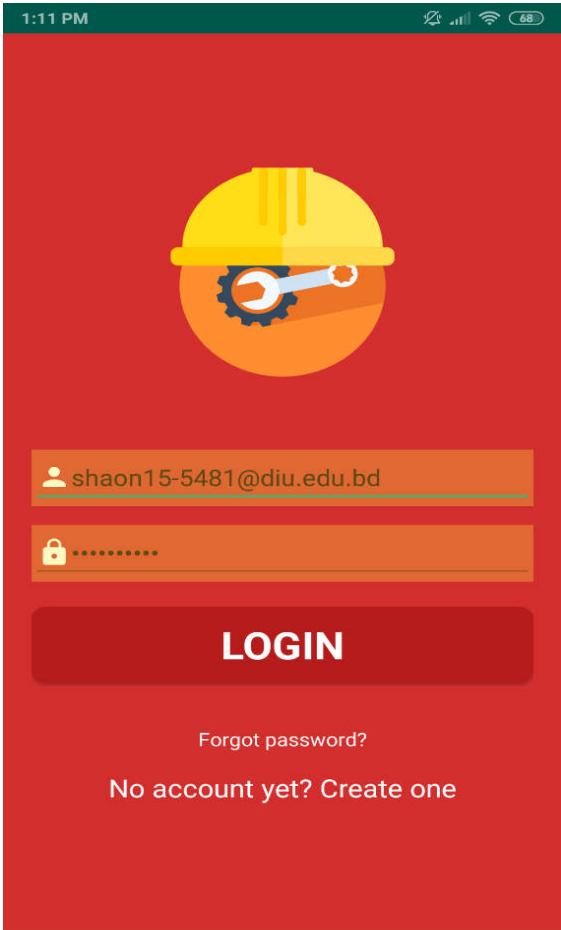


Figure 4.6: Log in



### 4.3.4 Switch Profile Mode

In this Switch profile mode seller mode and another mode is buyer mode.in seller mode seller can easily see hi product list, he can update their product, product list. On the other hand, buyer can see the product list, advertisement from enter the process and can connect easily with seller.

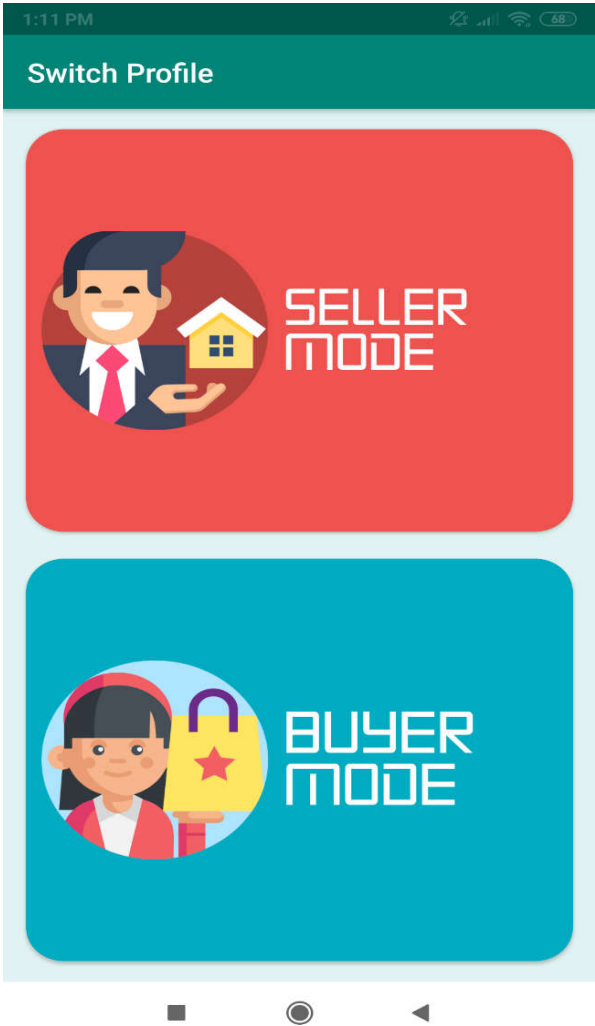


Figure 4.7: Switch Profile

### 4.3.5 Supplier Mode

In this part seller can easily post product, update product price, posted products area zone, transaction, live chat between different two kind of stakeholders and buyer's order part.



Figure 4.8: Showing supplier mode

### 4.3.6 Buyer Mode

Buyer can enter into the product portion and see the product and chose it from here, then he can order it and can chat with the seller and also transaction for buying necessary product he needed.

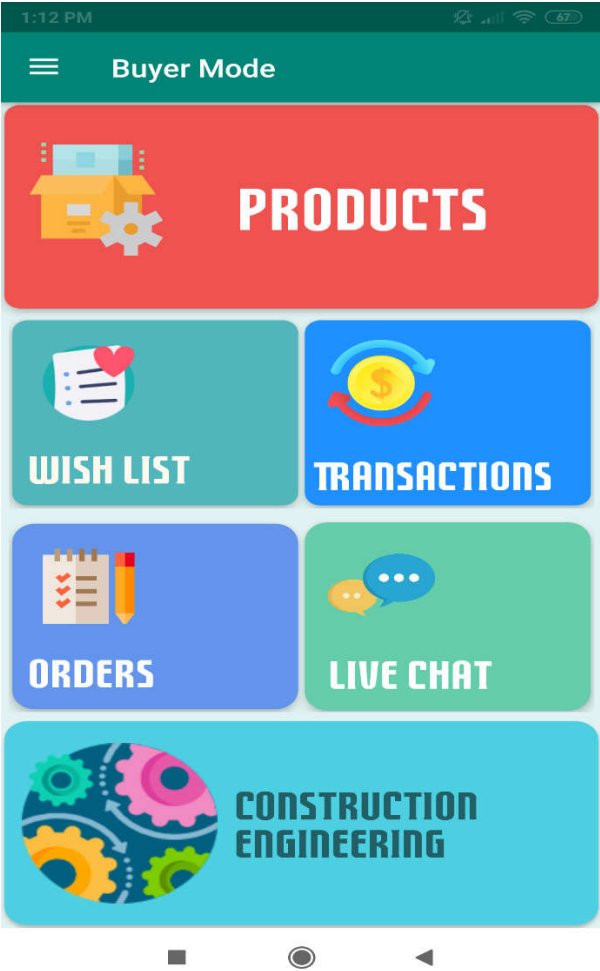


Figure 4.9: Showing buyer mode

### 4.3.7 New Product post

If the seller need to post the necessary product then he can post here for further updating, heading, company name, service, price, description and also seller can update image.

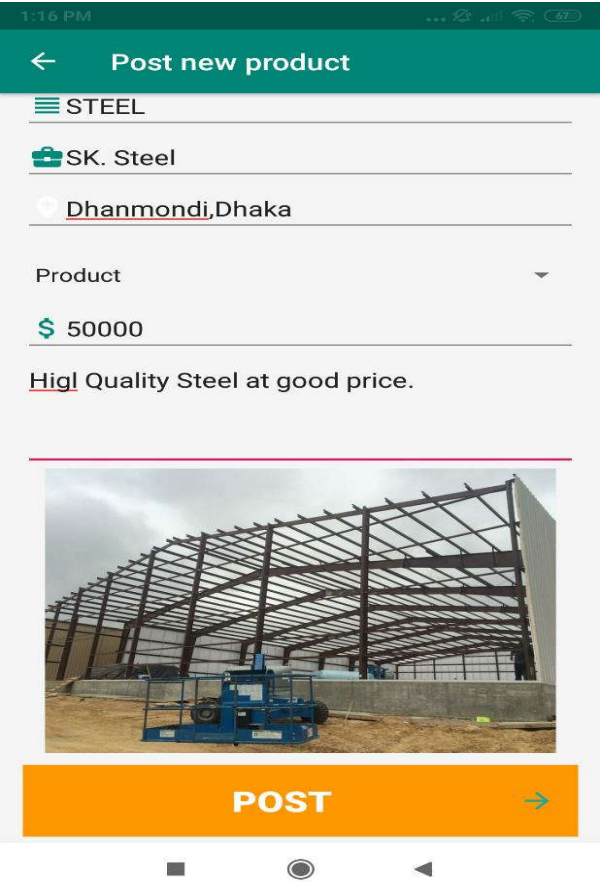


Figure 4.10: New product Post

### 4.3.8 Giving Feedback

The stackholders can easily give feedback in this part. "User name"," password" and "feedback details "here and also a part of "email response".ad user can send it usually for giving feedback.

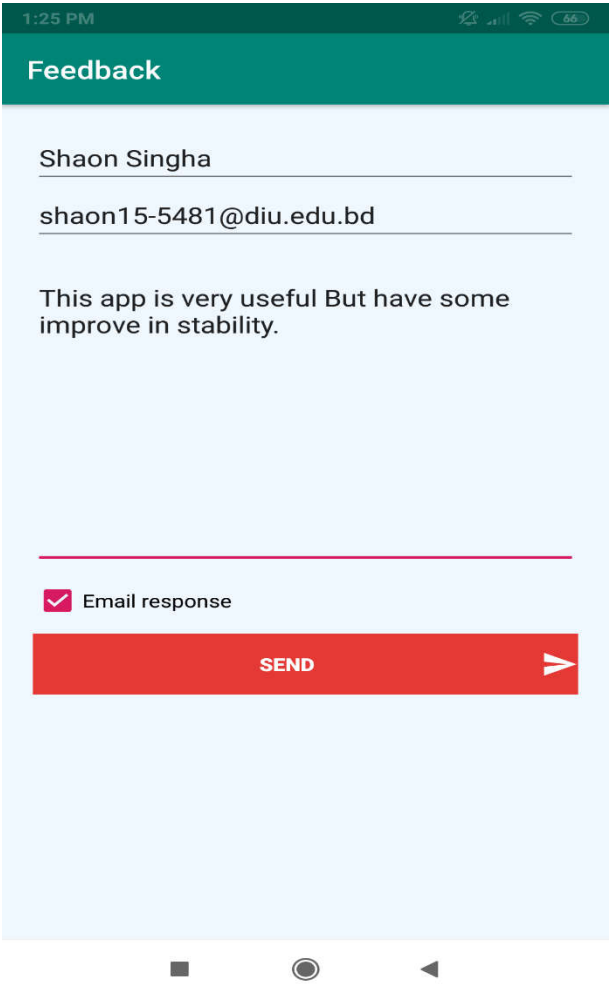


Figure 4.11: Feedback Giving

### 4.3.10 Building and Land Developer

Here user can see his local area developer information like address, city, and country .telephone etc. It will help user who don't know the information.



Figure 4.12: Building and Land Developer

### 4.3.11 Construction Engineering

This is an article type portal. In this portal there are many type of construction engineering related topic like Architectural engineering, Reber, Blueprint etc.



Figure 4.13: Construction Engineering

### 4.3.12 Live chat

Live Chat is very useful feature in our application. Here buyer talk to the seller before buy anything.

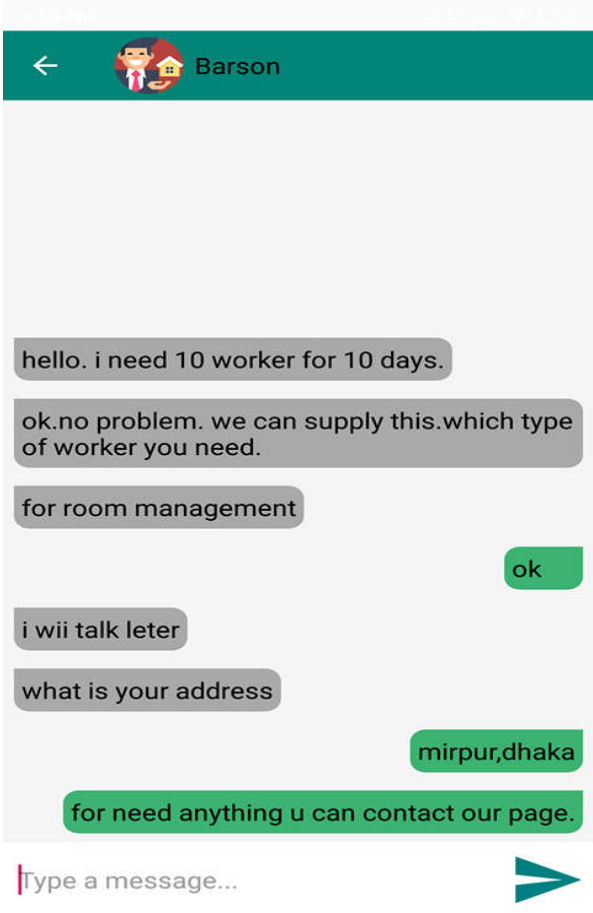


Figure 4.14: Live Chat



## **4.4 Implementation Requirements**

### **4.4.1 Android Studio**

Android Studio is the IDE (integrated development environment) for android operating system. Using android studio, we developed our application.

### **4.4.2 Android SDK**

Android SDK provides the API libraries and developer tools necessary to build, test, and debug android applications.

To develop Android application, Android SDK is the essential tool. This SDK is very comprehensive tool that contains not only the library for development, but also includes the simulator to test the application.

### **4.4.3 Java Development Kit (JDK)**

JDK is an implementation of either one of the Java SE, Java EE or Java ME platforms.

### **4.4.4 Android Virtual Device (AVD)**

The AVD manager provides a graphical interface which run the android application called emulator. A QEMU-based device-emulation tool that can use to debug and test applications in an actual Android run-time environment.

## CHAPTER 5

### TESTING AND EVALUATION

#### 5.1 Usability Test

In Usability Testing we usually test its performance, user friendly or not, speed, apps functionality, user experiences etc. We ran a survey among 40 users their aged between 18- 30. On this survey 30 of them are male and 10 of them are female.

We asked them few questions about our app and they reply our questions. By analyzing those questions we set up a survey report about our app. The output of our survey report is given below as a bar chart.

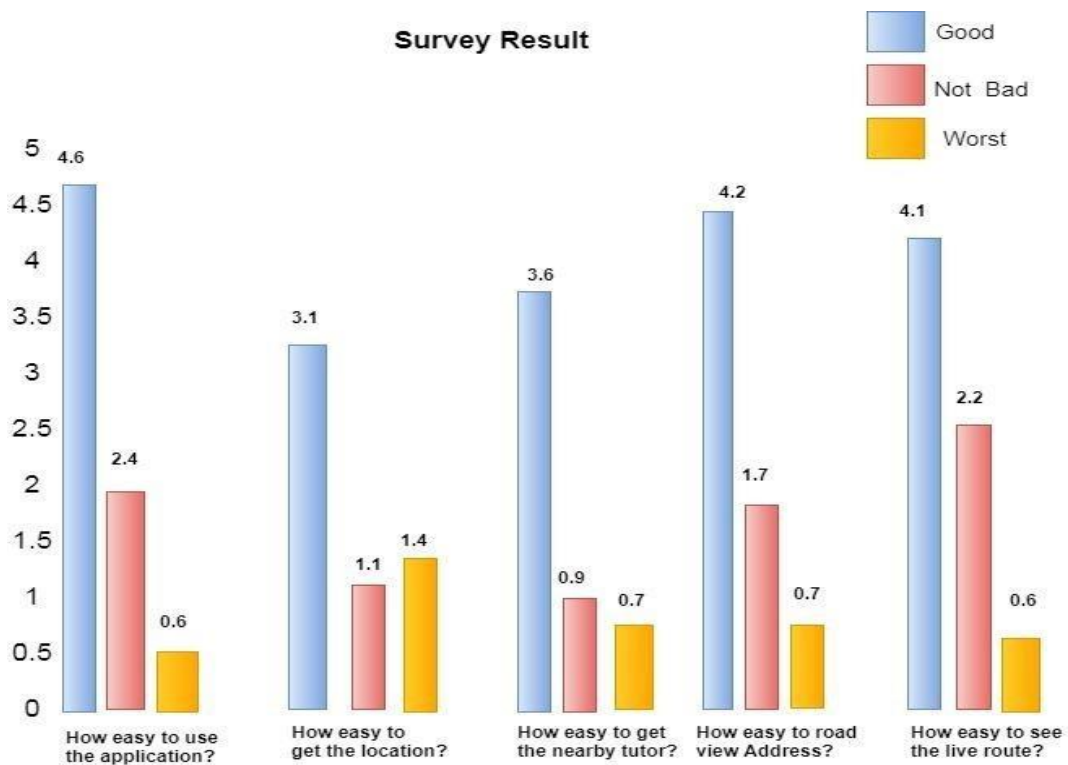


Figure: 5.1: Survey Result

Finally we found the result is –

- Better quality application
- Better performance
- Better UI
- User friendly
- Easy to use

## **5.2 Unit Test**

Unit test is very important thing it help us to designing and implementing our project. It is a process which can help us to develop our project. In unit test there is a table and it has some option which are independently tasted and implemented after passing the test [11]. In unit test there is options related our project. It was done when we implemented our codes and project. There is some condition and variables those must be fulfill when we test our project. The test result of our project is given below. Under there is a table containing some requirements?

Let's see our project can fulfill those requirements or not.

Unit testing is commonly automated, but may still be performed manually. The IEEE does not favor one over the other. The objective in unit testing is to isolate a unit and validate its correctness. A manual approach to unit testing may employ a step- by-step instructional document. However, automation is efficient for achieving this, and enables the many benefits listed in this article. Conversely, if not planned carefully, a careless manual unit test case may execute as an integration test case that involves many software components, and thus preclude the achievement of most if not all of the goals established for unit testing.

### 5.3 Result of Unit Test

**Table 1: Result of Unit Test**

| Test Case                         | Test Input    | Expected Output                  | Actual Output                      | Result |
|-----------------------------------|---------------|----------------------------------|------------------------------------|--------|
| Interface visibility              | Tested on AVD | Interface are display correctly. | Interface are displayed correctly. | Pass   |
| Correct Response for each button  | Tested on AVD | Display correct activity         | Displayed correctly                | Pass   |
| Click Call Button                 | Tested on AVD | It should make a Call            | Successfully Calling               | Pass   |
| Click About Us Button             | Tested on AVD | It should go About Us activity   | Go successfully About Us activity  | Pass   |
| Map Zoom in & out                 | Tested on AVD | Should zoom in & out properly    | Successfully Zoom In & Out         | Pass   |
| Click Logout Button               | Tested on AVD | It should leave from account     | successfully logout                | Pass   |
| Click network connectivity button | Tested on AVD | It should connect with internet  | Successfully connect               | Pass   |
| Click Back Button                 | Tested on AVD | It should go back                | Go Back Successfully               | Pass   |

## 5.4 Testing Implementation

I have tested my project in different times. Login system, create post, feedback, username, password, seller option, buyer option. Password like six character when I give seven or more or less then it will not login up to next step also similar main system. @, ., , etc. are included for the login mail security system.

It also tests chatting part, live chat with customer and seller server. I tried real time data base and input Data then tested we got success. I have tested the following things: Sign up Login system Forget password/ Email Seller profile Buyer Profile Product post list live chat Update product.

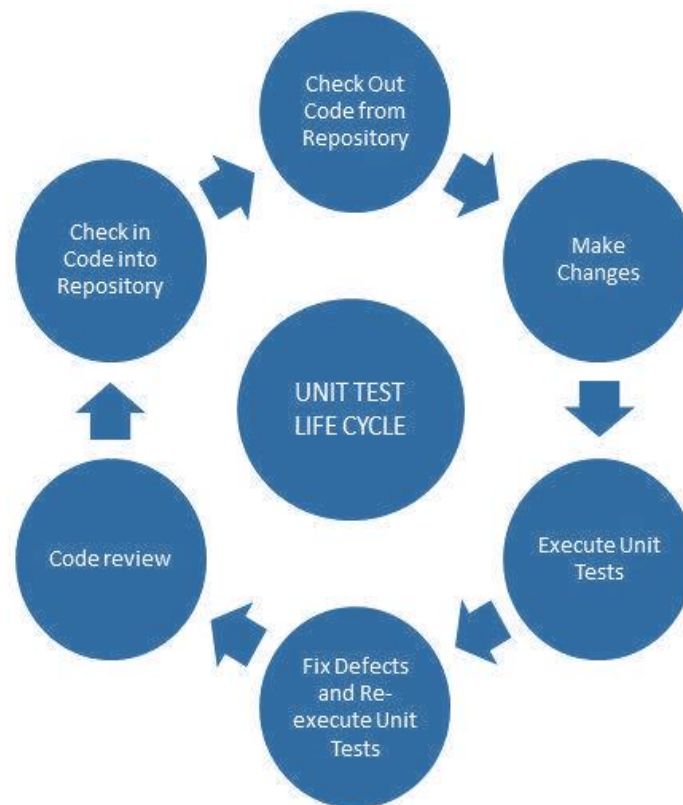


Figure 5.4: unit testing life cycle

## CHAPTER 6

### CONCLUSION AND FUTURE SCOPES

#### 6.1: Discussion and conclusion

Our “Constructor hub” project is very reliable and user-friendly app for the sector of construction related people. Usually goal of the project like business sector (construction) with relationship between buyer and seller for control house or anything development. Buyer can easily see the product list and chose it from here and seller can update product list or advertise the constructor or builders’ company top list by live chatting Method on system between buyer and seller are secured and it is helpful for them to buy and sell product by conversation.

#### 6.2: Scope for further development

- Work for gorgeous look and attracting for user interface.
- Live video support.
- Commercially viable database.
- Develop highly security system so that information will not be leaked.
- Skill testing.
- Rating system.
- Google location
- More system will be added in live chatting part

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## **APPENDIX A: Project Reflection**

The appendix is to provide an introduction to project reflection. This is very hard and challenge for me to complete this project. I complete it from research, designing, developing, add new thing is very much hard. It is a hard pressure for me to contribute whole part of project within a short time.

My experience was how to analysis the project part by part, how to do proper planning, how to solution, graphical interface and implementation problem. Firstly I faced problem sign up method, how can I setup login part or sign up .It was a great problem authentication method of user login part. If I set forget password, then it need to enter six or maximum digit it included. After that database management system one of the greatest problem for me two connect with the system. Then online chatting system is one another major art to include two user reliable communication. It has some problem arises when made connectivity between buyer and seller user conversation .After that it made possible to connect the live chat system between the users accurately. The graphical view is more important to include the system outlook. Within a short time it was a problematic process for me and I took lots of time and see tutorial .one mode to another mode exchange is very hard t cat part by part into the system by measurement of the layout and user reliability. Thus it looks to see very user friendly system for the user comfortable and reliability chatting system are included. So that

The communication between the different kinds of stock holders are needed to use the system for user friendly through a good and reliable conversation. It was really a great concern for me how to make it easy but some great problem has arisen to compete the project within a very short time.



## Appendix B: Related Diagram

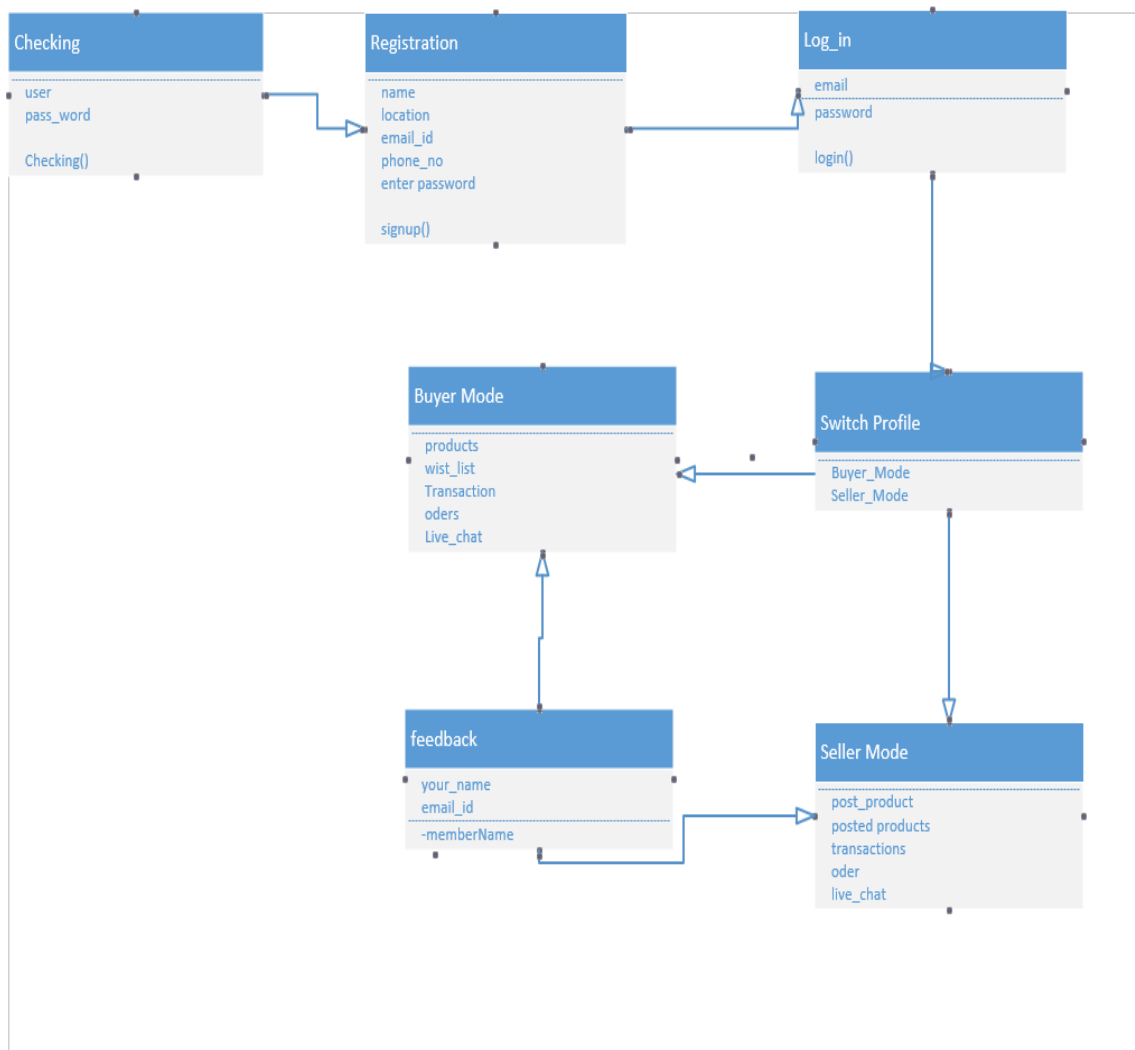


Figure: Appendix B UML Diagram

# CONSTRUCTION HUB- AN ANDROID APPLICATION FOR CONSTRUCTION SERVICES

## ORIGINALITY REPORT

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