# SMART FIELD SERVICE: AN ANDROID APP

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## APPROVAL

This Project/internship titled **"Smart Field Service Android App"**, submitted by Rasel Hosen ID No: 161-15-6904, Anwar Hossain ID No: 161-15-6965 and Nasrin Sultana ID No: 161-15-6968 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 of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 5th December.

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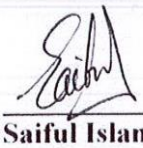

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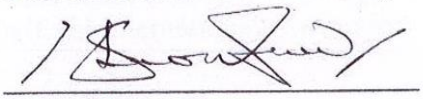

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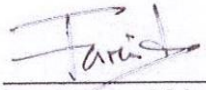

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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Itisha Nowrin,Lecturer, Department of CSE** 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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# ABSTRACT

Time is very important in our life. There are many shops and Companies in Bangladesh. But they don't buy and sell their product at the right time. Because of this, both of them suffer many losses. Every shopkeeper and company want to save their valuable time. Shopkeepers don't want to waste their valuable time waiting for the delivery man to buying products for his shop. A Company wants Shopkeepers to know their products very quickly. smart field service is an app through which, companies can easily deliver their products through deliveryman quality and Shopkeeper can easily contact the company through these apps if a product has problems or dates over. shopkeepers can provide the product to the customer as per their demands. shopkeeper always wants everything easily. Smart Field Service is an app through which Companies and Shopkeepers solve their problems. The main purpose of this project is to save valuable time. This project presents an application named "Smart Field Service". In this app, only shopkeepers and companies can create an account of their desired character for the purpose consumption of time and buying and selling their products.



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# CHAPTER 1

# Introduction

## 1.1 Introduction

Bangladesh is a developing country and also a huge population. Every day a lot of consumer goods are needed for this huge population. Many shops and companies were created here for this large population. Business plays contribute to our society. Which plays a significant role in the formation of our society. Business improves the quality of life of people and creates a high quality of life. Businesses are not only important because they provide products and services to the customers. but also improve the economy and increase employment for the people of the society. We look forward to developing an app that can deliver and sell product in a short time and low cost when a developer creates something, they must be conscious about how easily they can communicate with each other. It is a project for the communication between shopkeeper and company. We choose this project because this field is never used before. There are many online-based apps but these types of apps do not exist. Shopkeepers and Company will get more benefit from this app. The online application app will save time both of Shopkeepers and Company, and also shopkeepers can order easily necessary products. Companies can advertise their products very easily as well as learn about Shopkeeper's location through Maps and products can be easily delivered.

## 1.2 Motivation

- The main Motivation of Smart Field Service is to reduce shopkeeper problems. By this shopkeeper will be able to fulfill the customer's needs.
- The Company can easily sell their products by reducing time and cost.
- They can also improve their products as there is a rating system.
- The company add their new product and will be sending message if any new product they available.
- The shopkeeper can contact the company in an instant through messaging.



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## 1.3 Objectives

- **Reduce time**: When Delivery man goes to a shop far away from it, that is too much costly but Delivery man using this app will go to a nearby shop. So, it reduces the overall cost. Delivery man can easily locate the position of the shopkeeper and timely delivery of the product.

- **Real time information:** The Company will be able to produce goods according to the need of the shopkeeper. They will get product details such as product price, quality everything by using apps.

- **Customer satisfaction**: It will help to maintain Customer Commitments. When some products are finished but customer needs those products, shopkeeper can order the Company required products using this app.
- **Reduce travel and waiting time**: The Company can sell their product by reducing time and cost. Deliveryman can supply the products because he does not have to go to shopkeeper again and there will be less trouble for him.

## 1.4 Expected Outcome

Finally, the application is working very well. The entire system is organized by firebase. We are very positive for this unique work. Hopefully it will reach all over the country.

- Shopkeeper and companies will be connected with this application.
- Shopkeeper easily learn about new products and product offer**.**
- The shopkeeper can order his required goods.
- Deliveryman can easily locate the position of the Shopkeeper and timely delivery of the product
- The company will be able to produce goods according to the convenience of the shopkeeper.
- When there is any problem of the product the shopkeeper can easily talk about their company.
- By rating, the company can increase the quality of their products.



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## 1.5 Report Layout

**Chapter 1: Introduction**

In this chapter we have discussed about the introduction, motivation, objectives and expected outcome of our project.

**Chapter 2: Background**

Here the backgrounds of our project have been discussed. We have highlighted the other related works and made a comparison with our app and the scope of the problem and the challenges of the project.

**Chapter 3: Requirement Specification**

This chapter is all about the requirements like business process modeling, the requirement collection and analysis, the use case model of the project and their description, the logical data model and the design requirements.

**Chapter 4: Design Specification**

How we have designed the project, Front-end design, back-end design, interaction design and UX and the implementation requirements have been discussed in this chapter.

**Chapter 5: Implementation and Testing**

This chapter contains the implementation of database, front-end designs, interactions, test Implementation and the test results of the project.

**Chapter 6: Conclusion and Future Scope**

We discussed about the conclusion and the scope for further developments which pretty much derive about the project



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# CHAPTER 2

# Background

## 2.1 Introduction

The application is applying a gorgeous design on a system and making the system fascinating enough to increase the Shopkeeper and Company involvement without an extrinsic force. The thought behind this came from the concept of social communication. We will hope that these apps will be popular for being used in the Shopkeeper and Company engagement.

## 2.2 Relative Work

Smart Field Service is a new idea. But we have not found any work related to this type of project. So, we tried to work with this idea. There is no application about this found in google play store. There are many web-based E-commerce site applications in Bangladesh but there is no such Android app.

## 2.3 Comparative Studies

We have used in our Smart Field Service app real-time firebase and easy user interaction design. This app is basically for local areas. We have used to try to add different categories but no such app had been made before. We have put the scope of giving lots of photos of products. We have also added the Companies License photo and License number Authentication facility in our app. Shopkeepers will also be able to check the offer of the products and knowing about Companies.



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## 2.4 Scope of the problem

This project traverses a lot of areas ranging from business concepts to the marketing field and required to perform several researches to be able to achieve the project objectives. The field study of this application was more tough. For the very first time, we have faced a lot of problems. Some of those are shortage of data, shortage of accuracy, lack of Security, Lack of advertising, and shortage of investors. But now we have overcome this problem.

## 2.5 Challenges

Challenges are a very common feature in an application. We have to go through some challenges. One of them is the connection of the database. What type of data will be generated that was very difficult? How does shopkeeper know the Company is approved by the government? Another How can a Shopkeeper understand that a Company's product is good. Finally, we overcome the challenges. The database is synchronized and the user interface is very friendly. Hopefully, Shopkeeper and Company will handle the application easily.



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# CHAPTER 3

# Requirement Specification

## 3.1 Business Process Model

This is the graphical representation of any organization's business workflow to identify the developments. It can be done by flowchart, data-flow diagram etc. Here Company can show interest upload company information, add product, offer product and seeing the Shop list. Shopkeeper can upload the Shop information, see the product, order the product and see the company list etc. Business process model of Smart Field Service app is given below:

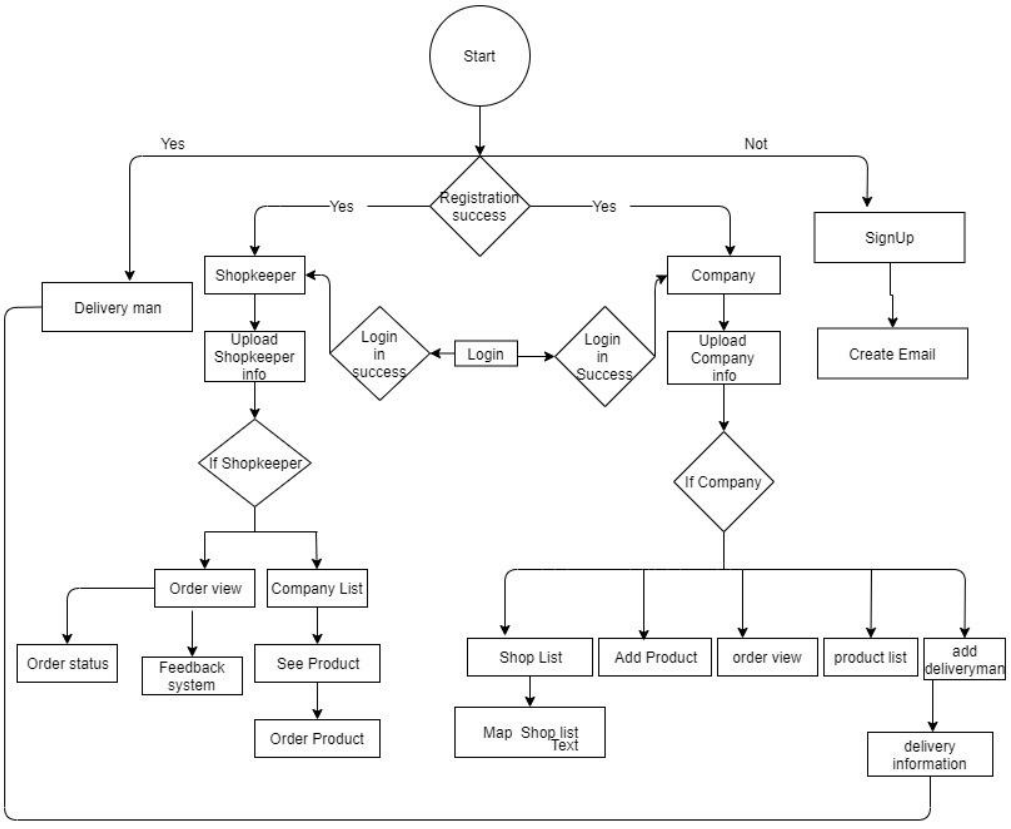


Figure 3.1.1 Business Process Model for Smart Field Service app



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### 3.2 Requirements Collection and Analysis

To develop a system there can be used software or hardware. Here I have used lots of logics, coding languages, software and an android phone to get my app done. For this I required:

- Coding languages
  - JAVA
  - XML
  - Firebase studio
- Software IDE
  - Android studio
- Hardware
  - Any android Phone

**Analysis**

In this busy world time is a valuable entity. And for earning money or other purposes Shopkeeper goes move from one place to another place and waste their valuable time finding to search a Company to live in a new area and for this situation, their work is being hampered. Moreover, the company has to visit the shopkeepers frequently for their new product which is waste their valuable time. So, discovering this problematic situation we have planned to make an easy way to find easily communicate shopkeepers and Companies to keep pace with this busy world without hampering the work.



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### 3.3 Use Case Model

It is used to simplify any model by graphical image and consists of a number of model components. To describe the proposed functionality use case model is most useful. Figure 3.3.1 shows the graphical depiction of how Smart filed Service app:

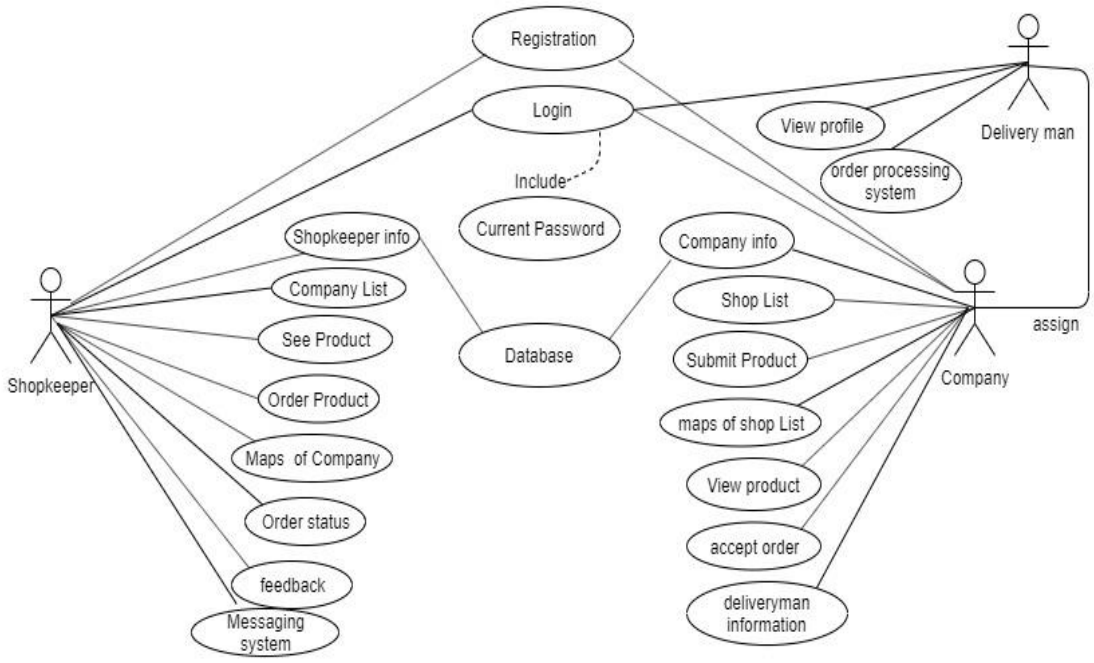


Figure 3.3.1 Use Case Model for Smart Field Service app



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### 3.4 Logical Data model

It shows that how the entities are related and act with each other. This is also called the ER Diagram. It requires the entities, their attributes and relationships among the entities. For Smart Filed Service app logical data model is given below in figure 3.4

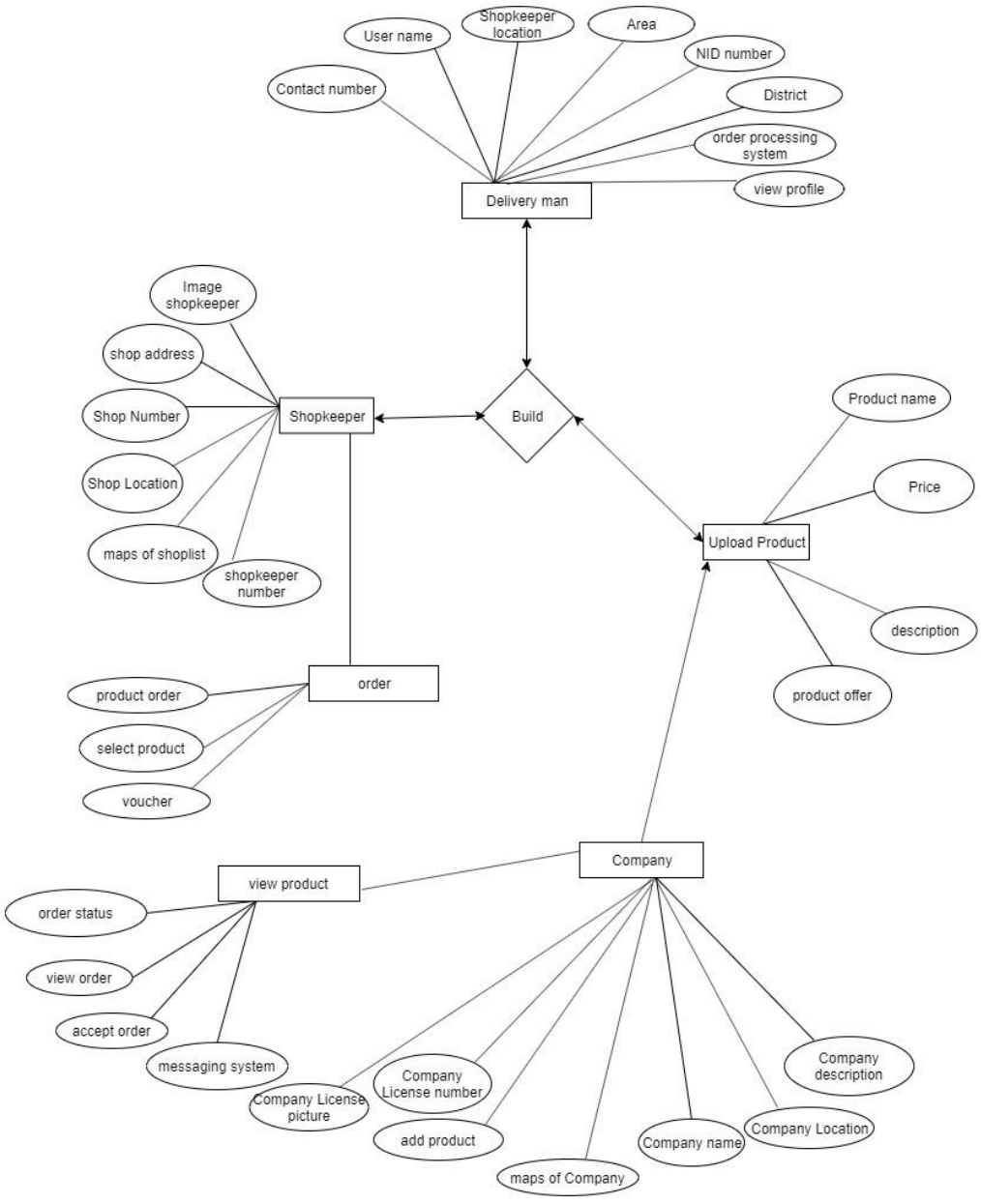


Figure 3.4.1: Logical Data Model for Smart Field Service app



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### 3.5 Design Requirements

We have kept some factors in mind while developing the app. We have tried to design this app in a way that Shopkeeper and Company can easily handle this app and get the desired or expected outcome using this app. For this we tried to make this app system compatible, efficient and user friendly.



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# CHAPTER 4

# Design Specification

## 4.1 Front-end Design

Front-end design works for the visual part of an application and with help of this a user can interact with the application. Here for a user the main thing is the front-end design [2]. In the sense of the coder it means the languages put together to set the UX of an app. To have a good experience for a user an app needs to be user-friendly and understandable. So, I tried to make this app user-friendly so that the user can easily understand and use it. Here XML has been used to make the user interface. Smart Field Service has many pages. So, there were a lot of designing part for different purposes for both the Shopkeeper and the Company. Screenshot is given in figure 4.1.1.

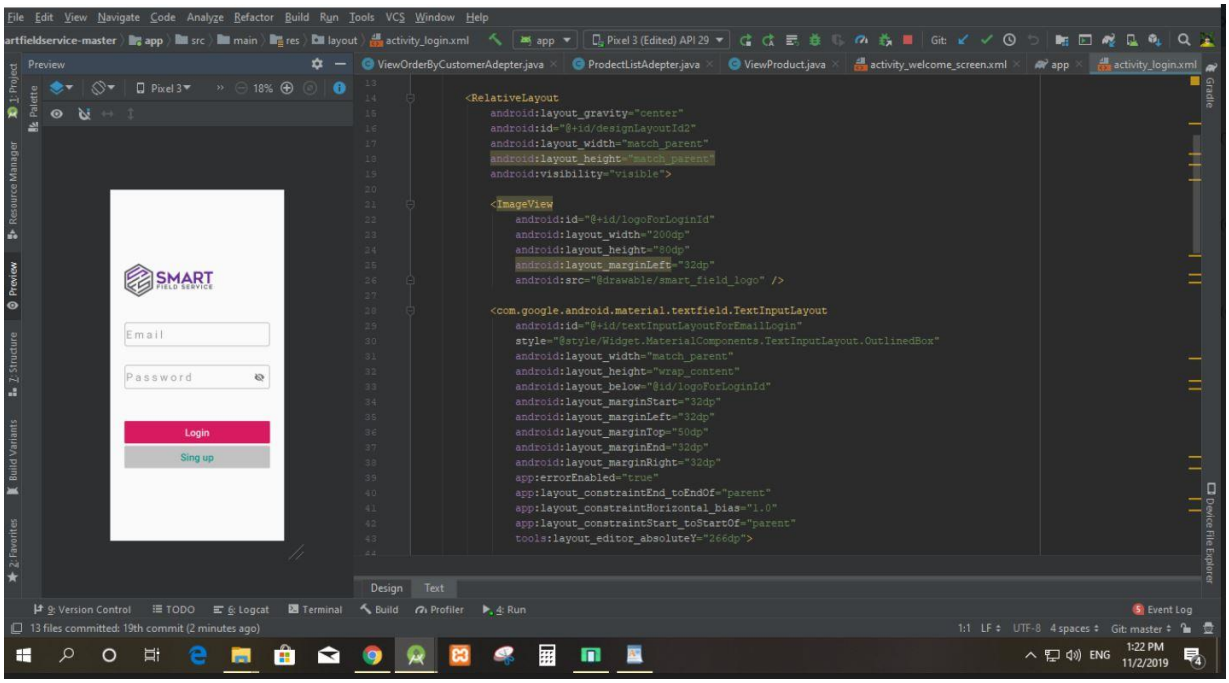


Figure 4.1.1 Smart Field Service User Interface and XML code in Android Studio



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To make this design work I had to use JAVA code and the screenshot is given is figure 4.1.2

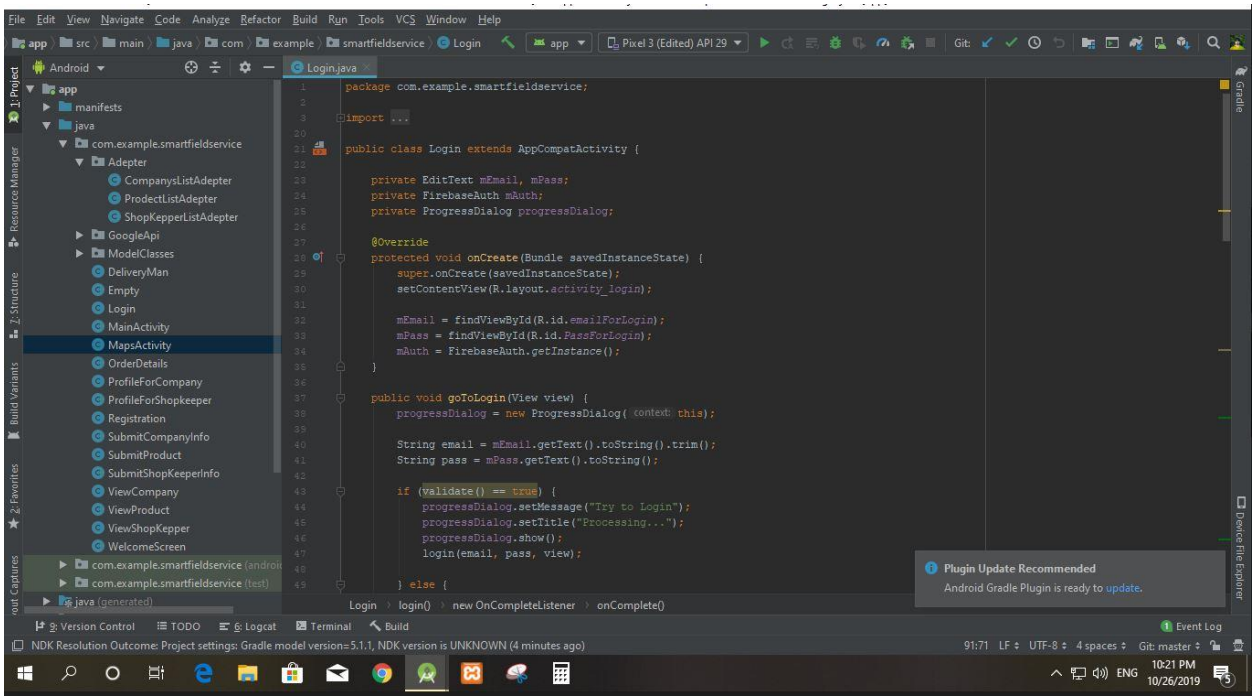


Figure 4.1.2: User Interface Starting Page JAVA Code



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New user registration page is like given in figure 4.1.3

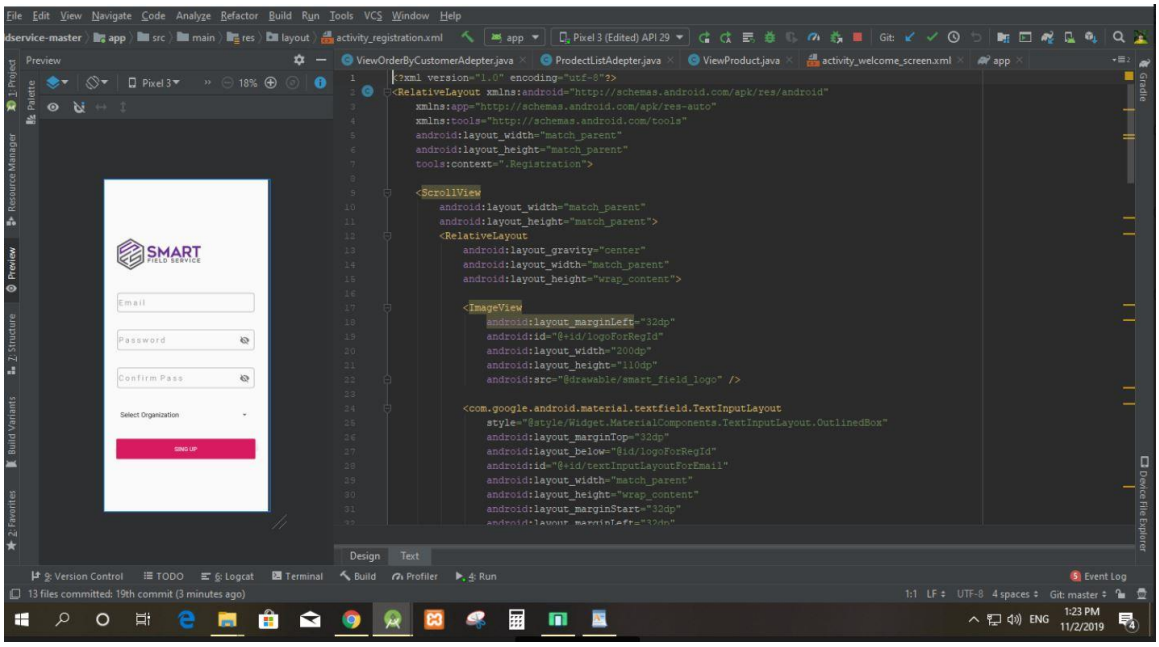

Figure 4.1.3: User interface and XML code Registration page in android studio

To make this design work I had to use JAVA code and the screenshot is given in figure 4.1.4

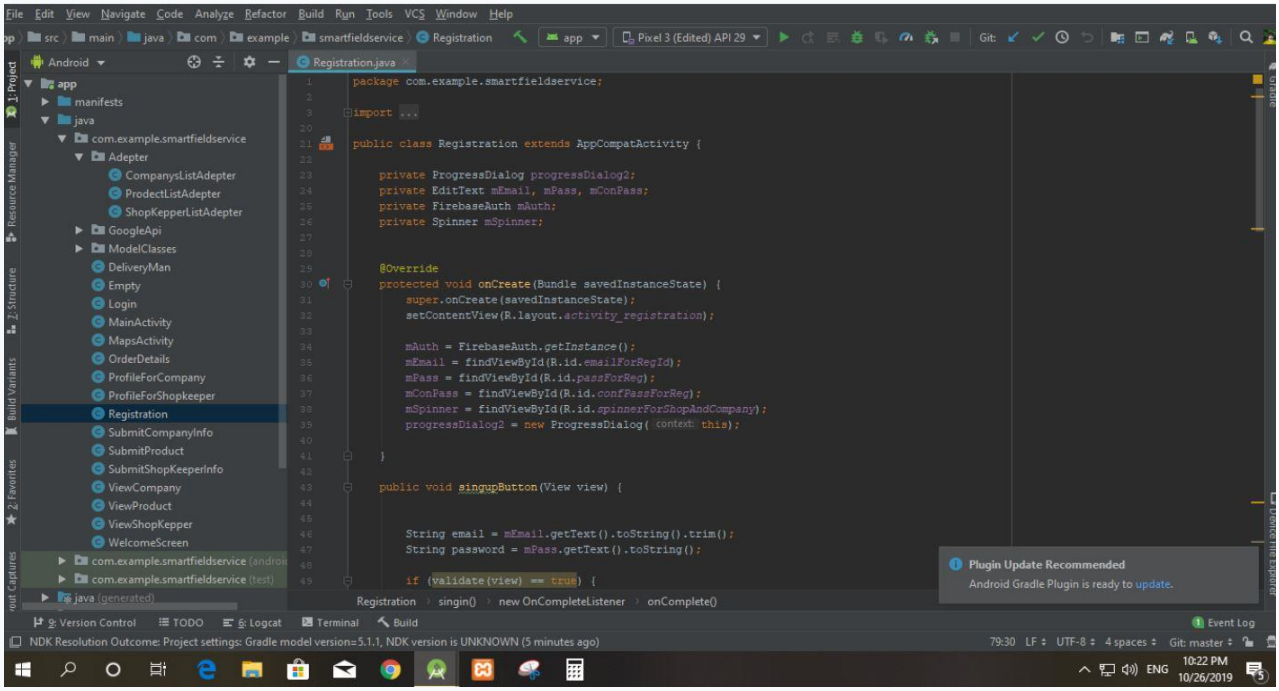

Figure 4.1.4 User Interface Starting Page JAVA Code



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After signing in some data will be asked by the application and the design of the page. To make this design visual XML language has been used and the coding part for this XML is given in figure 4.1.5

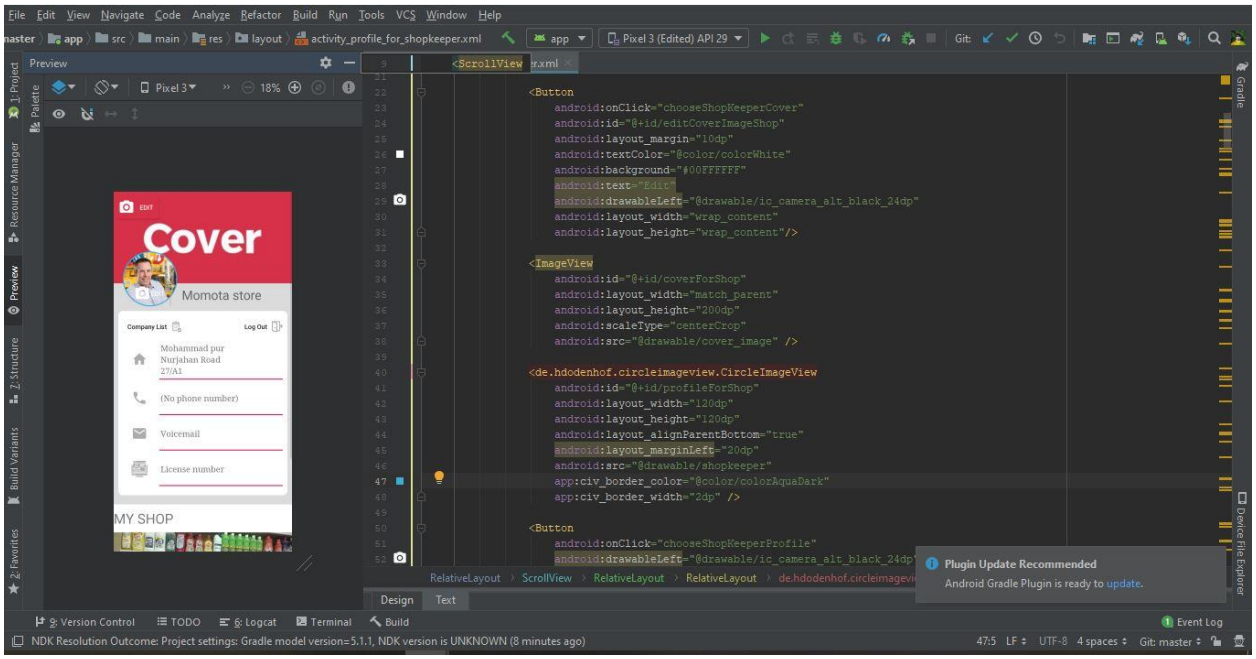


Figure 4.1.5 Shopkeeper Page and XML Code in Android Studio



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Java code to make the above XML language work is given in figure 4.1.6:

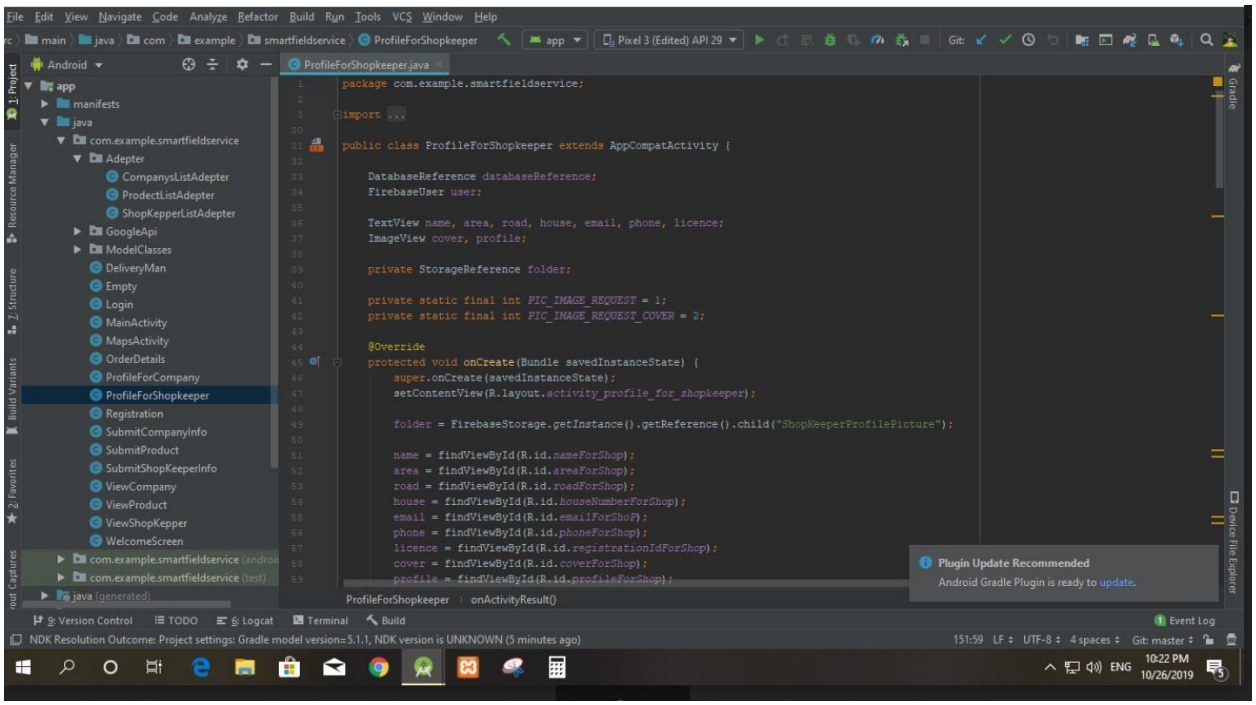


Figure 4.1.6 Java Code for shopkeeper Page in Android Studio

The shopkeeper's information submission form is given in figure 4.1.7:

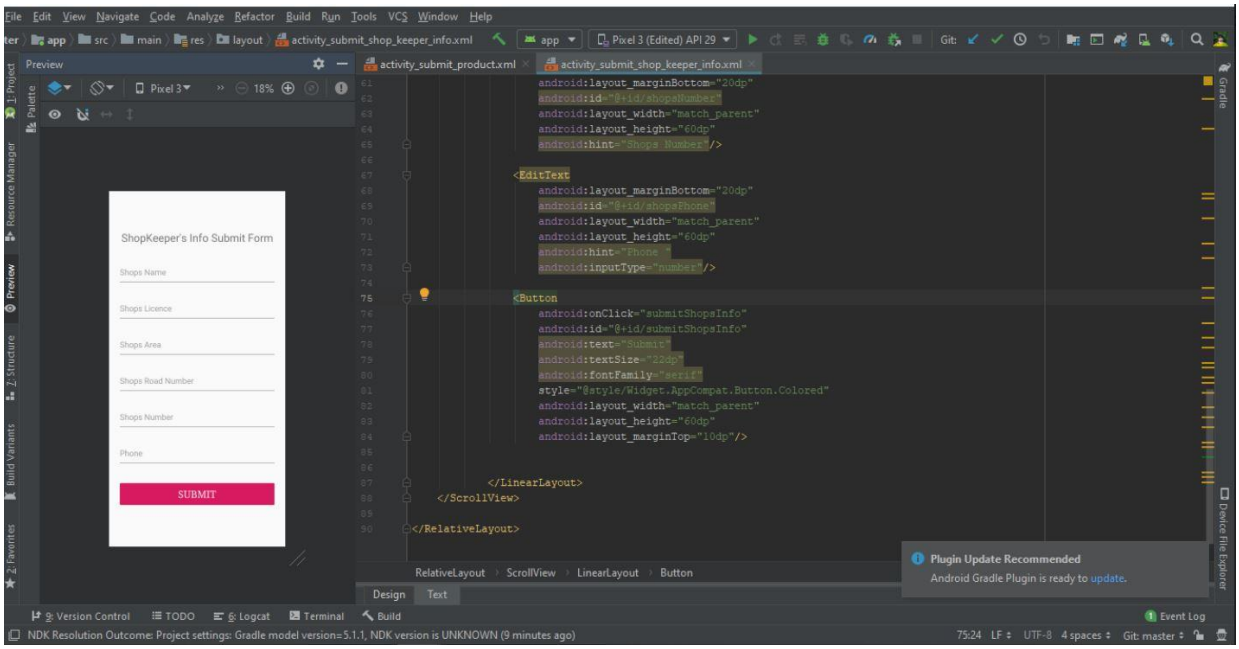


Figure 4.1.7 Shopkeeper information Submit from in android Studio



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After signing in some data will be asked by the application and the design of the page. To make this design visual XML language has been used and the coding part for this XML is given in figure 4.1.8:

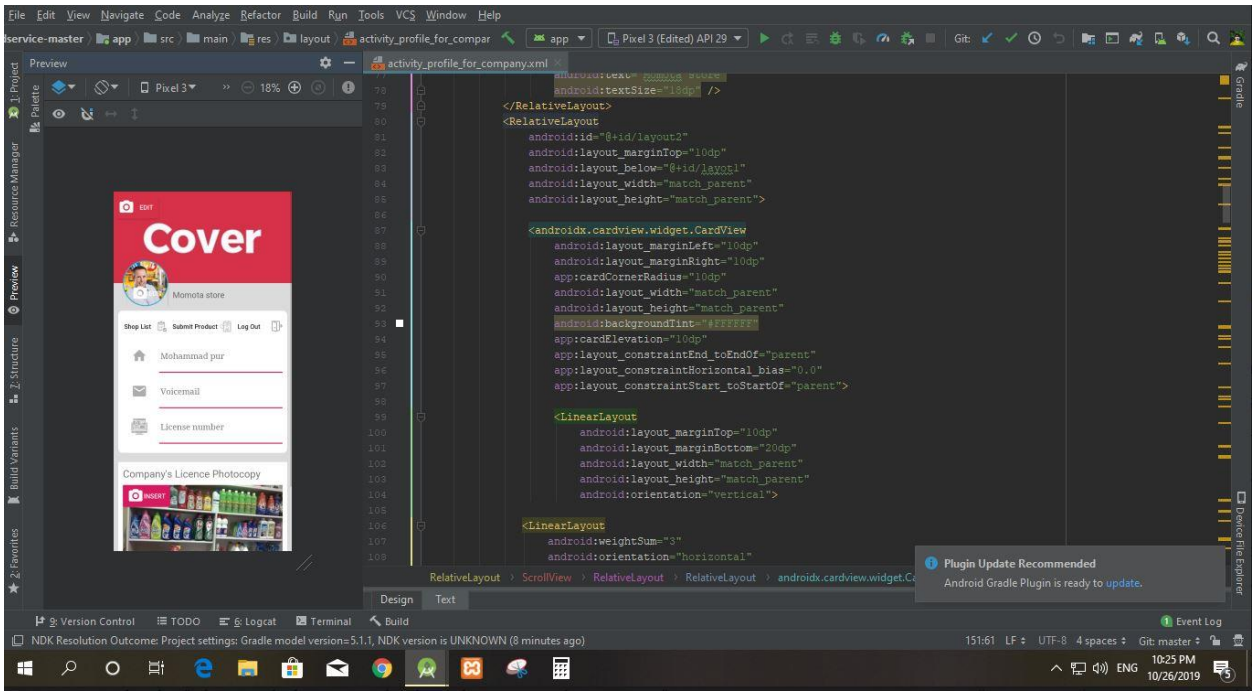


Figure 4.1.8: Company User interface and XML code in android studio

Java code to make the above XML language work is given in figure 4.1.9:

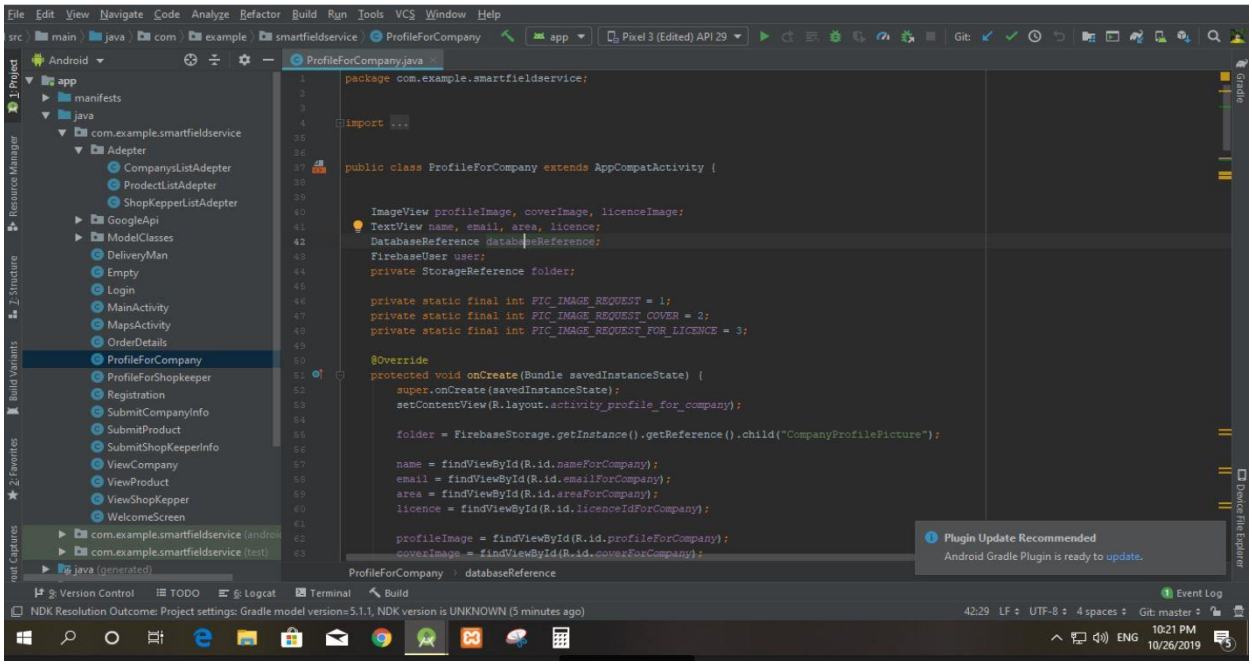


Figure 4.1.9: User Interface Starting Page JAVA Code



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Company information submit from is given in figure 4.1.10

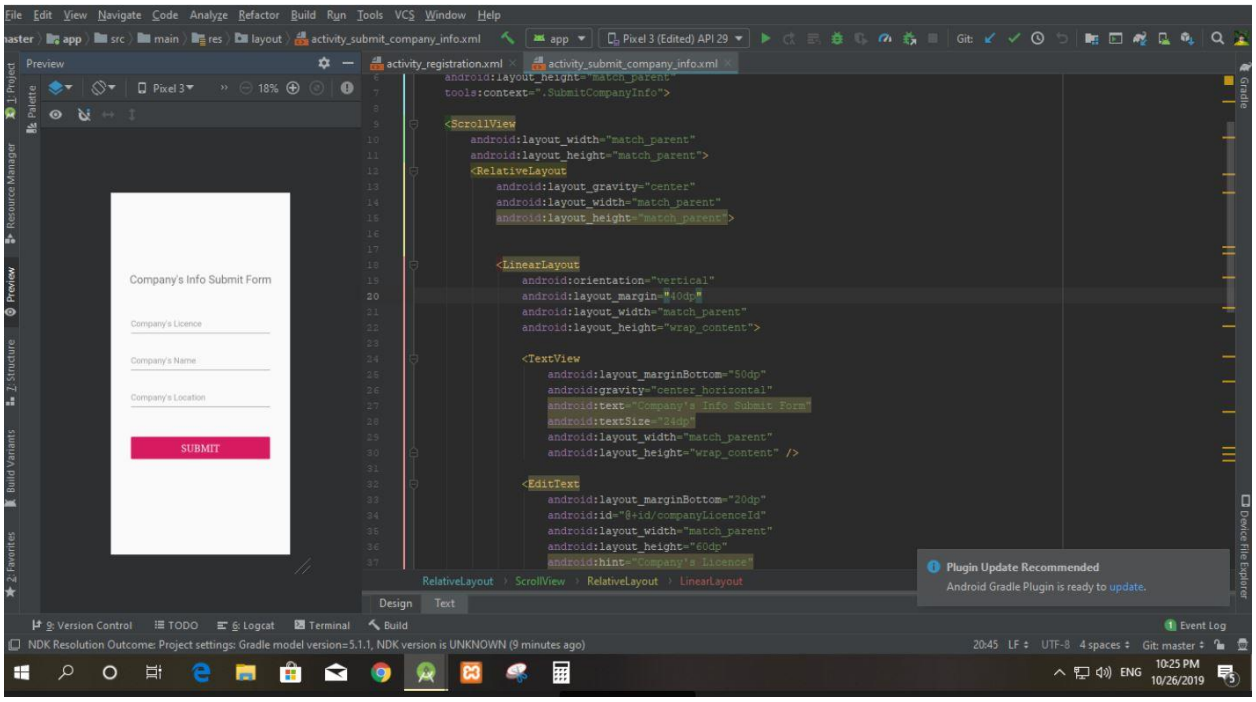


Figure 4.1.10: Company info Submit from in android studio

In this app are used in all company list view work is given in figure 4.1.11

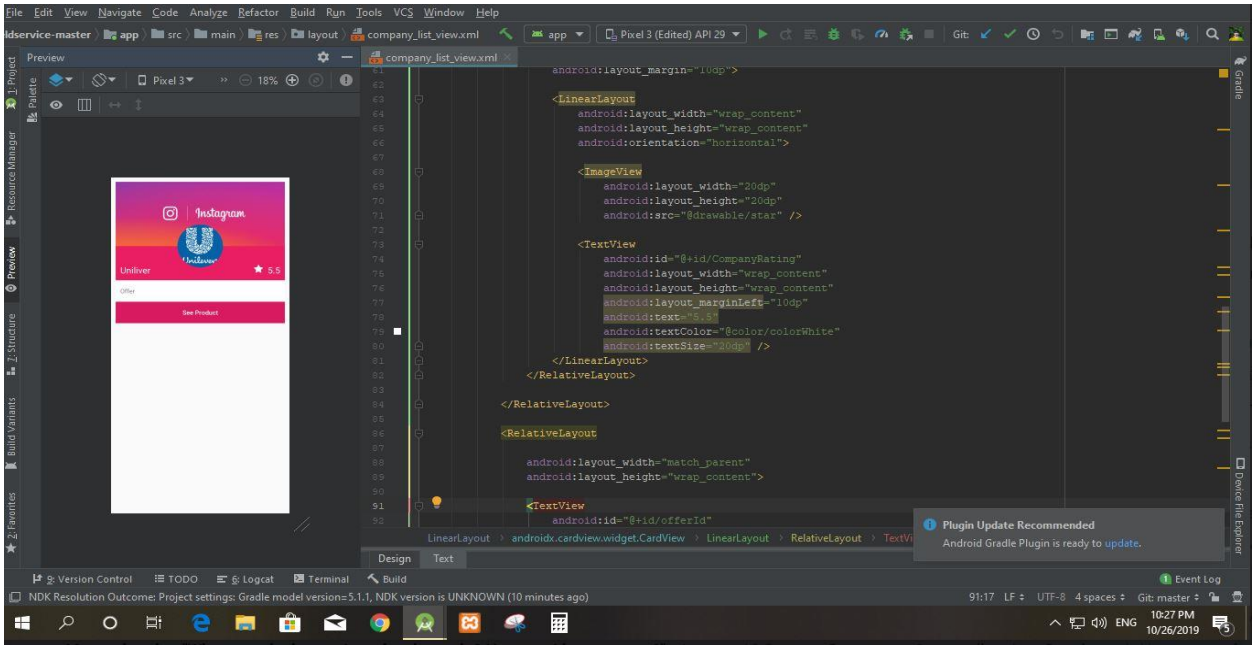


Figure 4.1.11: Company list view in android studio



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In this apps we are use delivery man, delivery man location through Maps and products can be easily figured in given below:

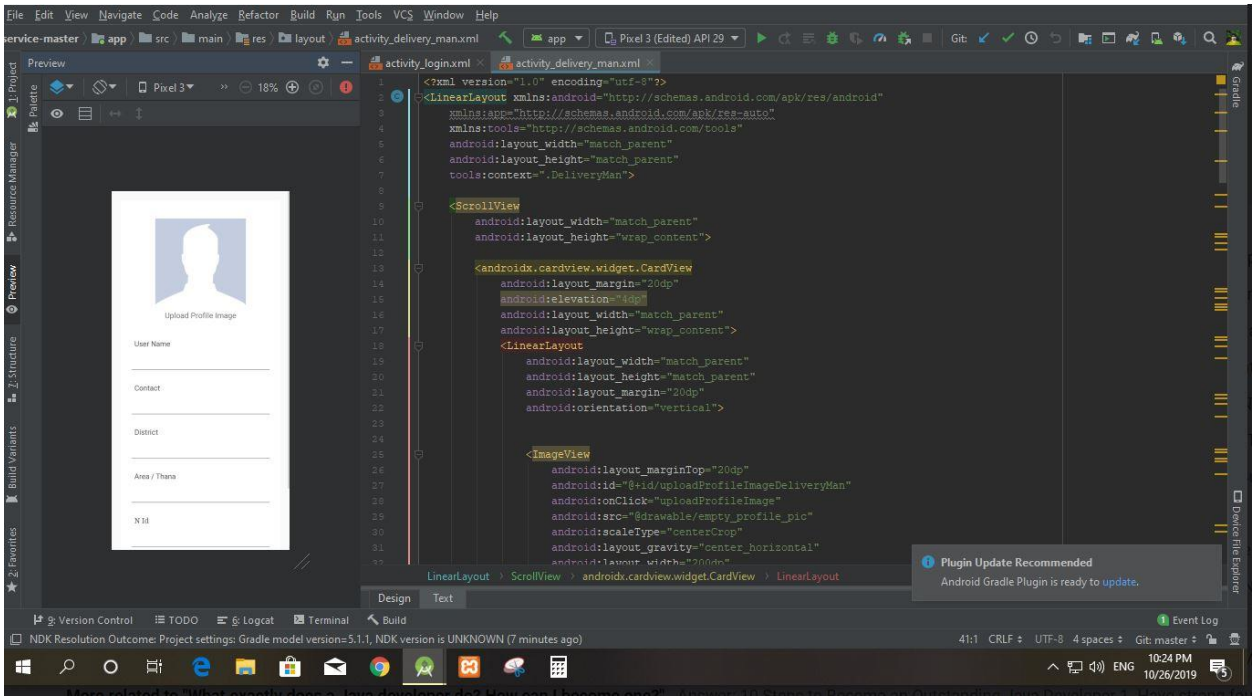


Figure 4.1.12: Delivery man info in android studio



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All product list view used in android studio is given in figure 4.1.13

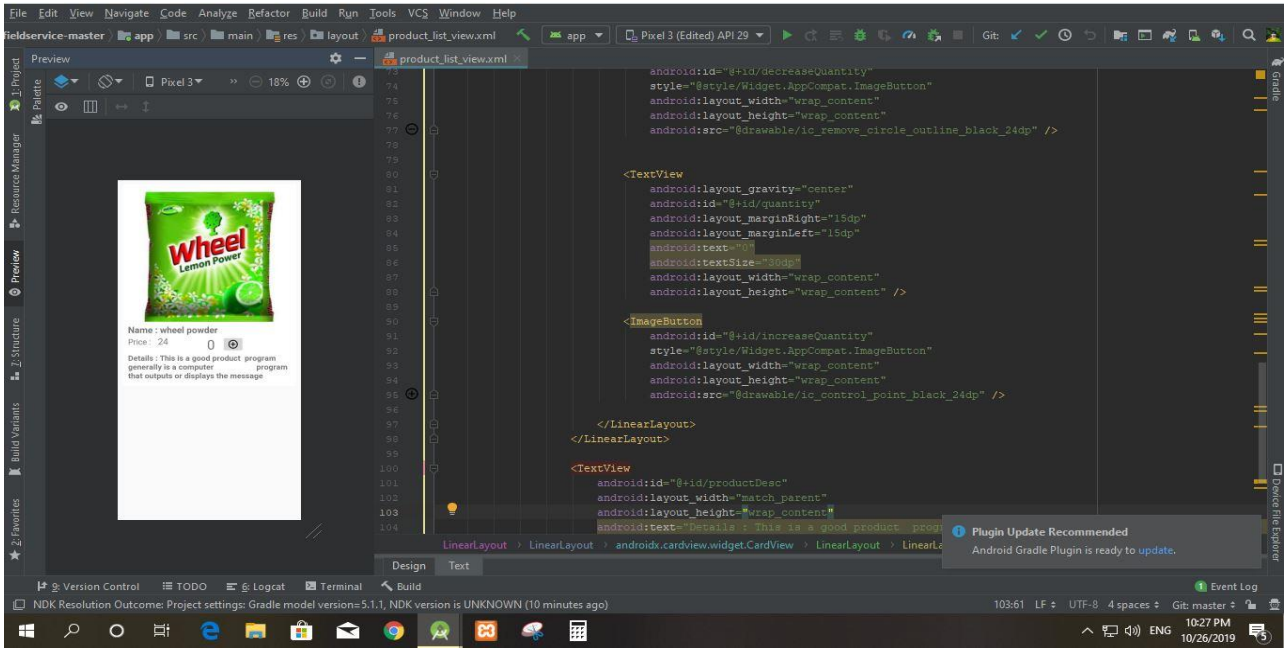


Figure 4.1.13: Product list view in android studio

But this is not the end of the project design. There are still so many codes for designing this application.

## 4.2 Back-end design

Main work of this app is occurred by back-end design. It is the most important part of this app. All logic of this app is here. Saving or displaying logic of back-end part data is given part to part. To develop and maintain the back-end section I have used Firebase database in my app [3] which is given in figure 4.2.1.

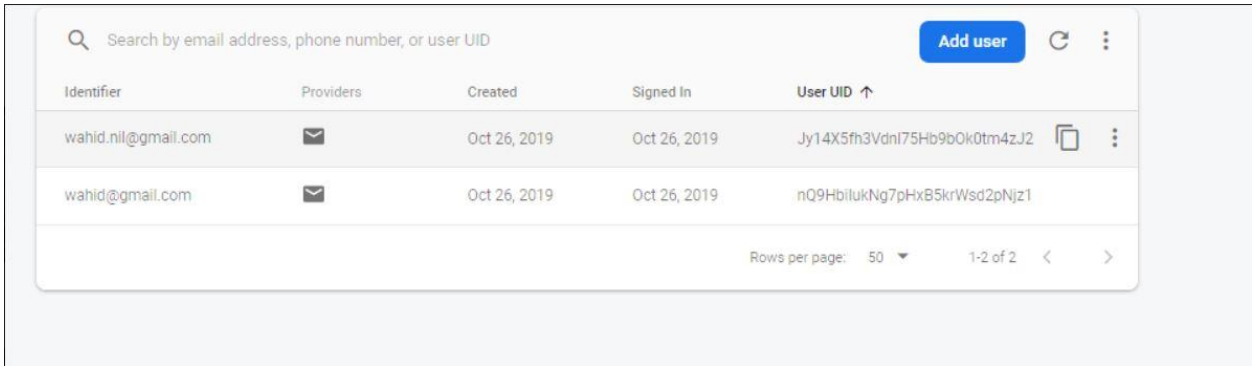


Figure 4.2.1 Firebase Authentication Page



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The vital part is database where we have used two entities, Company and Shopkeeper shown in figure 4.2.2.

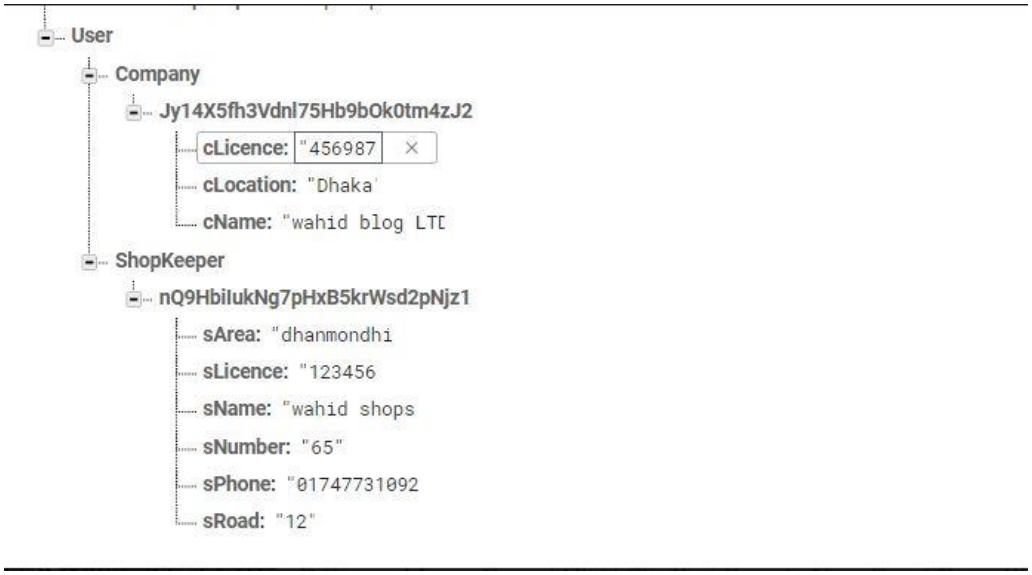


Figure 4.2.2: Firebase Database Page 1

This is a different database system which includes Company and Shopkeeper entities that shown in figure 4.2.3

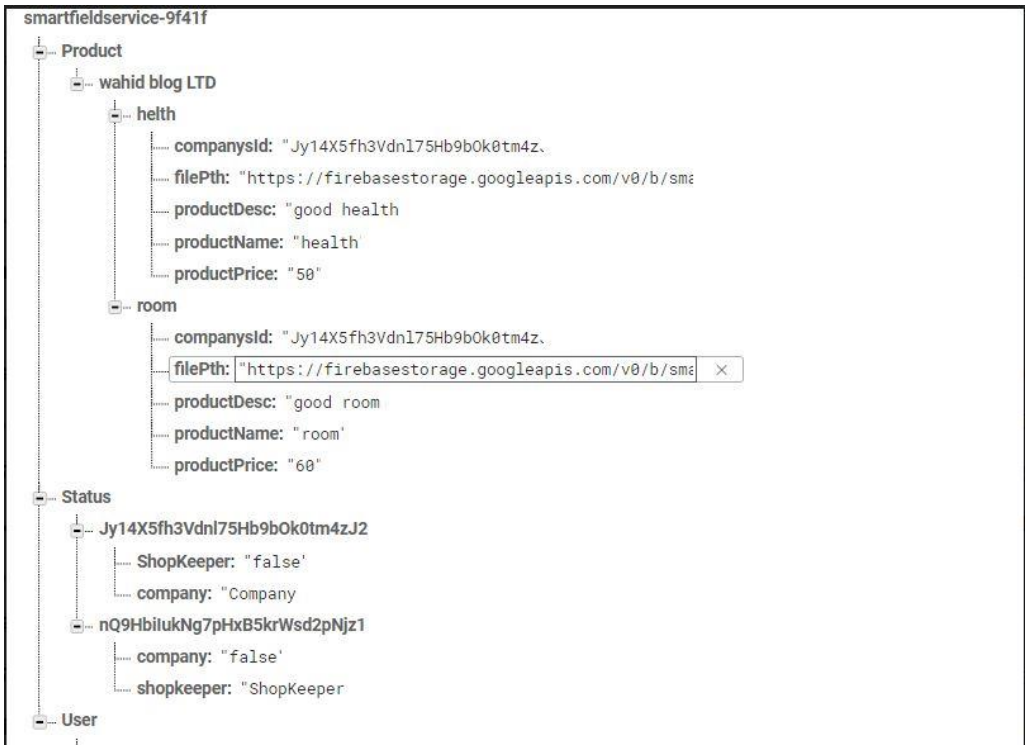


Figure 4.2.3: Firebase Database Page 2



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### 4.3 Interaction Design And UX

Interaction design focuses on the procedure of interaction between user and technology. To use an app-friendly or easily and to understand the interaction design of the app has to be so cleared and easy to understand by the user. And UX means user experience and this factor is also important as interaction design. Keeping these factors in mind we have tried to make our application simple and user-friendly so that users can use this app easily for their purpose.

### 4.4 Implementation Requirements

This app is an android app and for developing this app we have used some software such as

**Android studio IDE**

It is a full package for developing android apps. I have used android studio version 4.2.0.

**Android SDK**

It is a software development kit that helps to create applications for the android platforms [4].

It has some useful tools such as source code, development tools, an emulator and useful libraries to develop android apps.

**Firebase**

Firebase frees developers to focus crafting fantastic user experiences [5]. By the means of firebase users can modify the datastore and do not have to be bothered of writing API. I have used if for handling the back-end of the app.

**The Emulator**

It is a virtual android operating system that helps developers to use various versions of android to debug and test an android app [6]. I have tested my app to check whether it is run or not on a physical device.



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# CHAPTER 5

# Implementation Results and Testing

## 5.1 Database Implementation

Firebase frees developers to focus on crafting fantastic user experiences [5]. By the means of firebase, users can modify the datastore and do not have to be bothered by writing API. I have used it for handling the back-end of the app. My app's firebase has mainly three parts, one is for Shopkeeper and the other is for Company and Deliveryman. These three parts carry huge data for the whole app. Here for both Shopkeeper, Company and Deliveryman sign-in code is given below which is shown in figure

```
databaseReference = FirebaseDatabase.getInstance().getReference( path: "User").child("Company");
companysInfoArrayList = new ArrayList<>();
databaseReference.addValueEventListener(new ValueEventListener() {
    @Override
    public void onDataChange(@NonNull DataSnapshot dataSnapshot) {

        for (DataSnapshot dataSnapshot1:dataSnapshot.getChildren()){

            CompanysInfo m = dataSnapshot1.getValue(CompanysInfo.class);
            companysInfoArrayList.add(m);

        }

        companysListAdepter = new CompanysListAdepter( context: ViewCompany.this,companysInfoArrayList);
        recyclerView.setAdapter(companysListAdepter);
    }

    @Override
    public void onCancelled(@NonNull DatabaseError databaseError) {

    }
});
```

```
folder = FirebaseStorage.getInstance().getReference().child("CompanyProfilePicture");

name = findViewById(R.id.nameForCompany);
email = findViewById(R.id.emailForCompany);
area = findViewById(R.id.areaForCompany);
licence = findViewById(R.id.licenceIdForCompany);

profileImage = findViewById(R.id.profileForCompany);
coverImage = findViewById(R.id.coverForCompany);
licenceImage = findViewById(R.id.licencePhotocopyForCompany);
user = FirebaseAuth.getInstance().getCurrentUser();

databaseReference = FirebaseDatabase.getInstance().getReference( path: "User").child("Company").child(user.getUid());
databaseReference.addValueEventListener(new ValueEventListener() {
```

Figure 5.1.1: Firebase and Java



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## 5.2 Implementation of Front-End Design

After the implementation of all functions and features, the application was installed and so run on an android cellular phone. It works perfectly. The details are briefed below:

At first, a welcome activity takes places, here is some text fields and two buttons. One is Login and another is Signup.

Figure 5.2.1: Welcome Page



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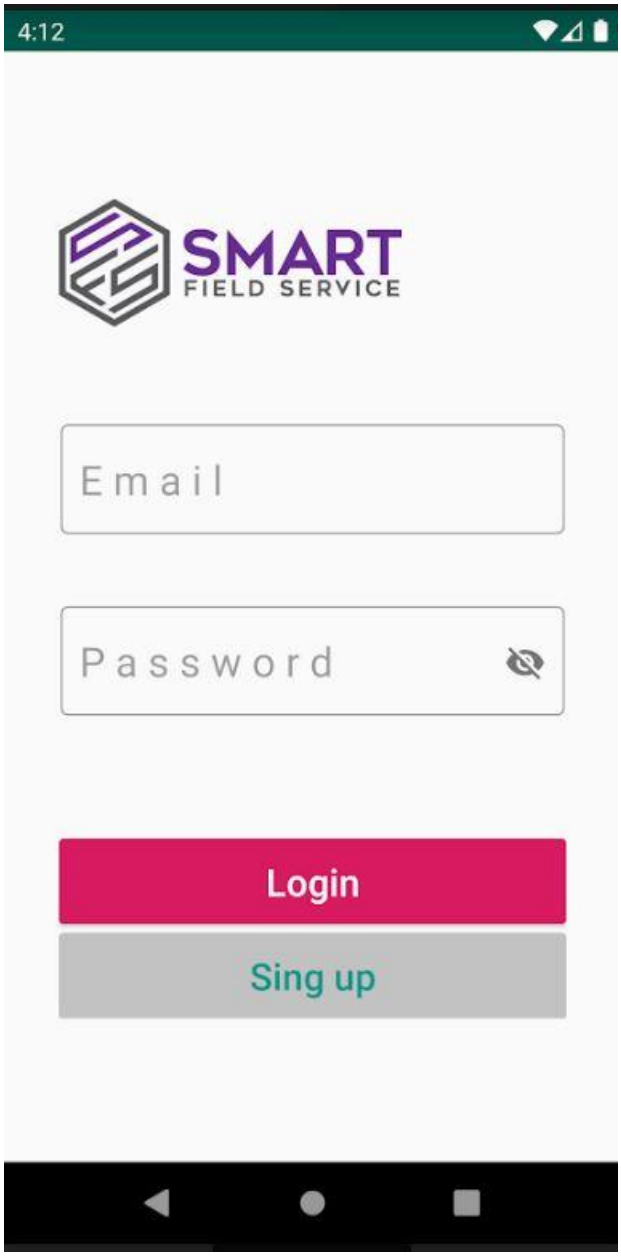


Figure 5.2.2: Sign-in Page



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If user have account then he will go for login. Otherwise he has no account then he will go for signup button to create an account.

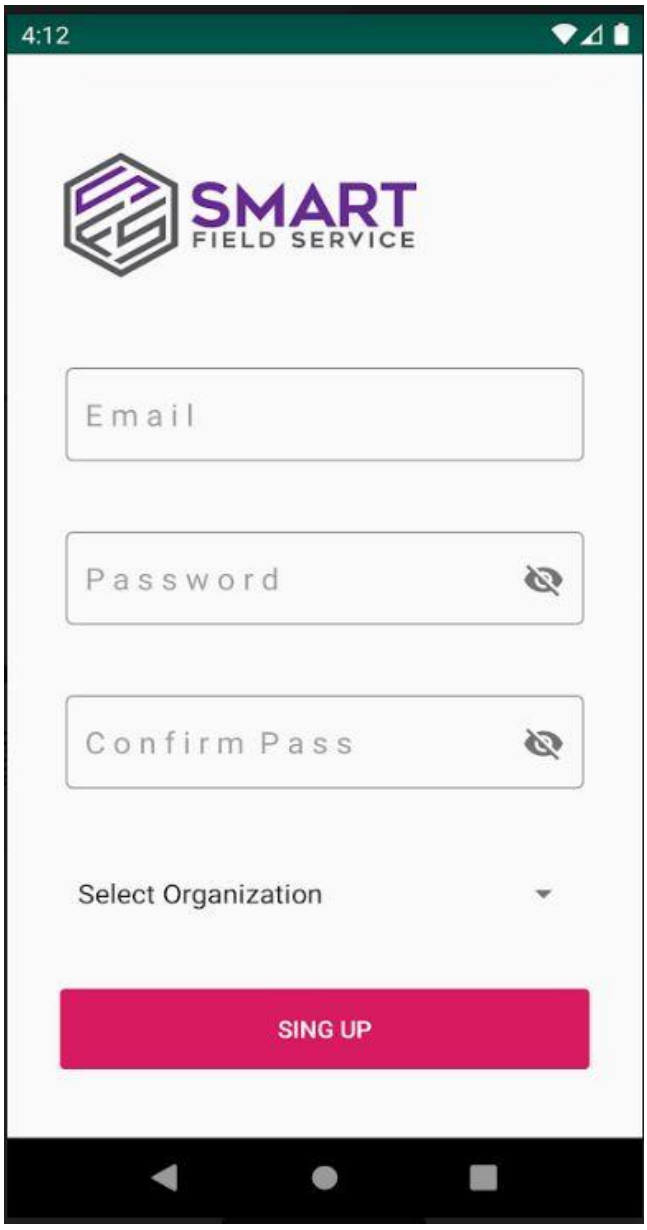


Figure 5.2.3: Registration Selection



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After creating a Shopkeeper account, this profile appears to the window. The profile contains with a profile picture, name, contact number, address etc.

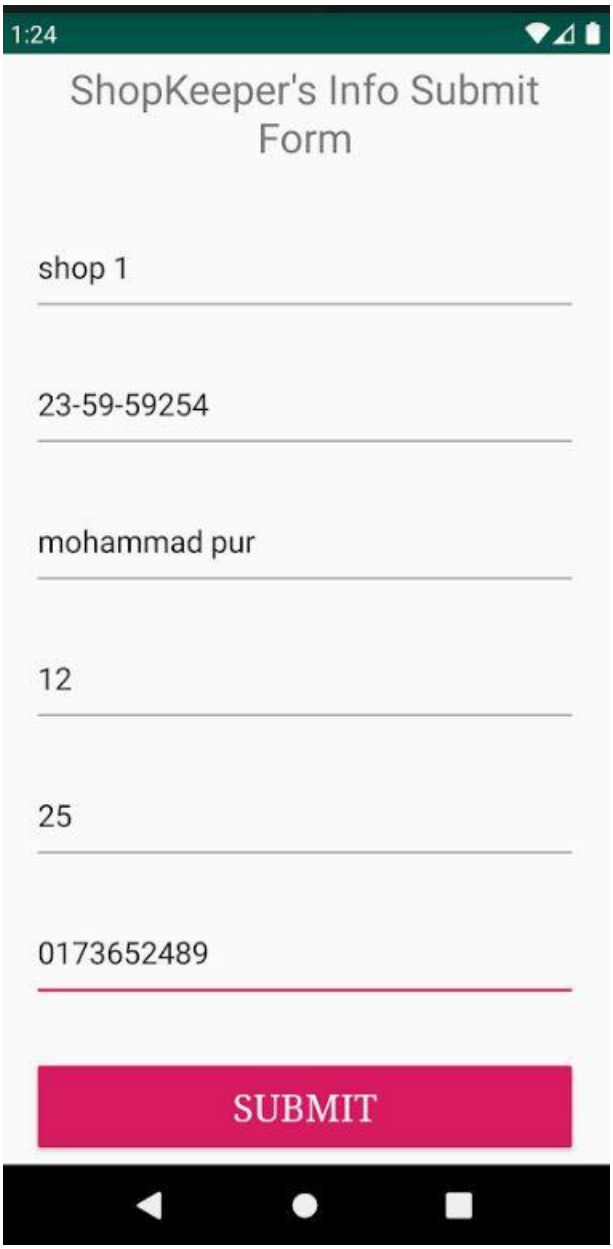


Figure 5.2.4: Shopkeeper information submit form



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Here are the Shopkeeper Profile is below in figure:

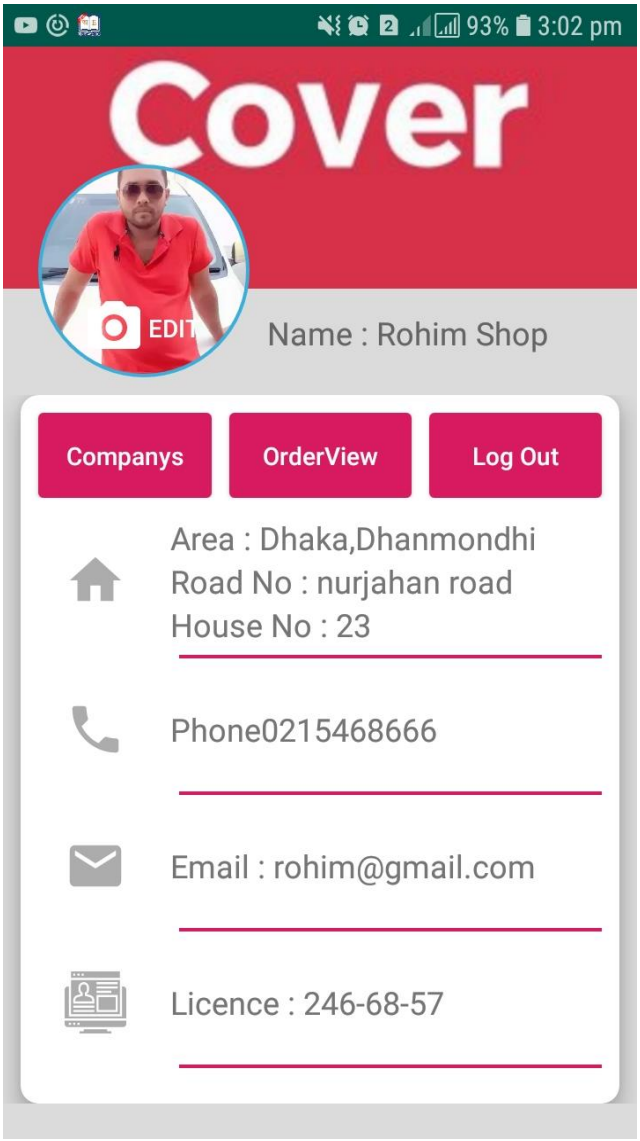


Figure 5.2.5: Shopkeeper profile information



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Shopkeeper can see the Company list is figure in below:

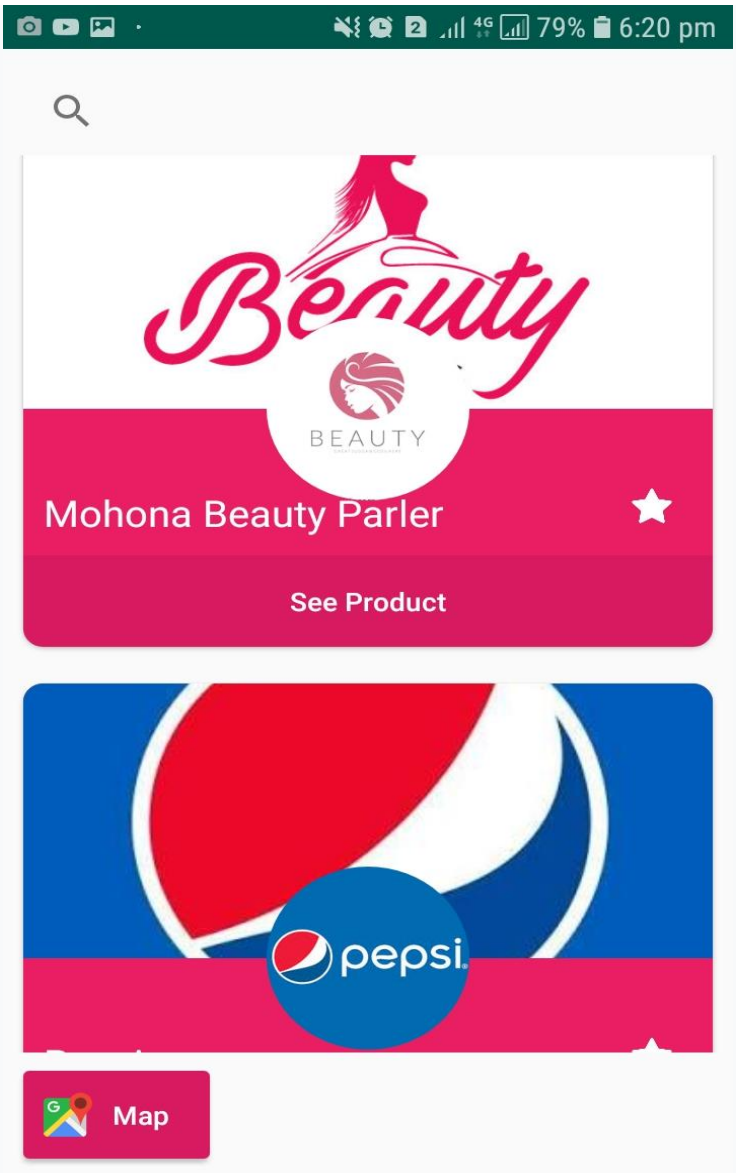


Figure 5.2.6: Company list information page



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Shopkeeper can see the product list is figure in below:

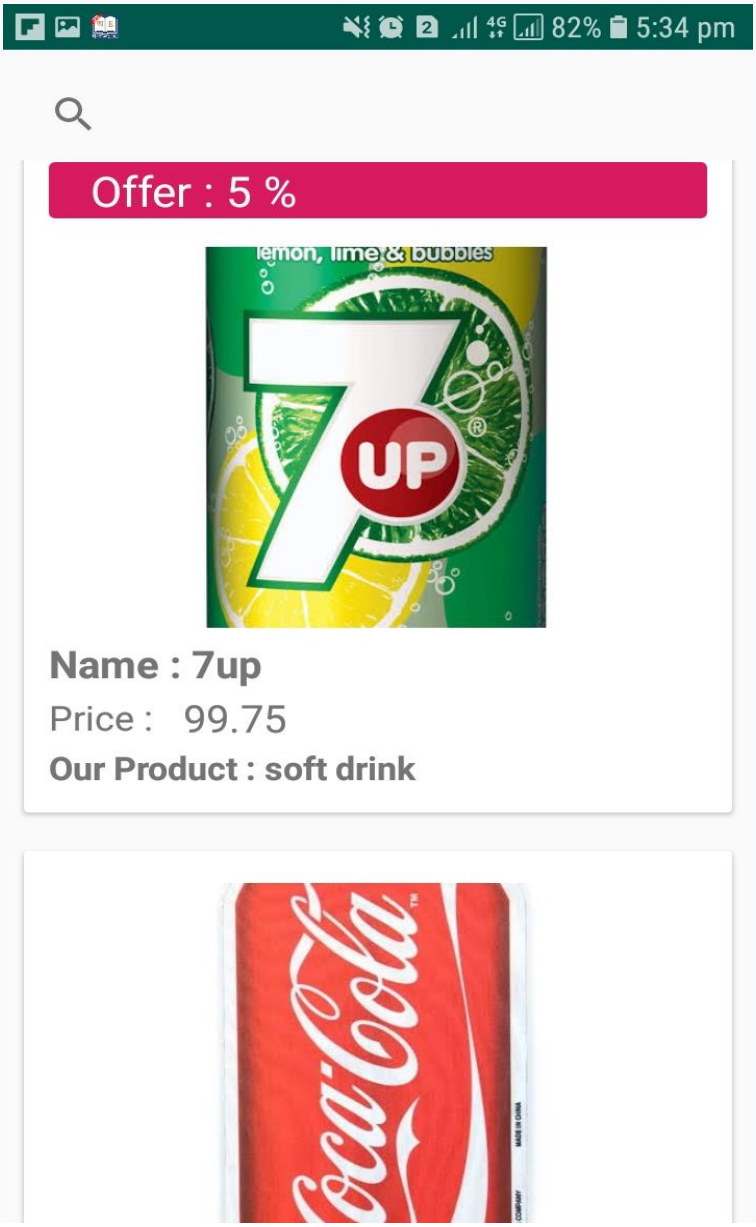


Figure 5.2.7: product list information page



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Shopkeeper can order the product figure in below:

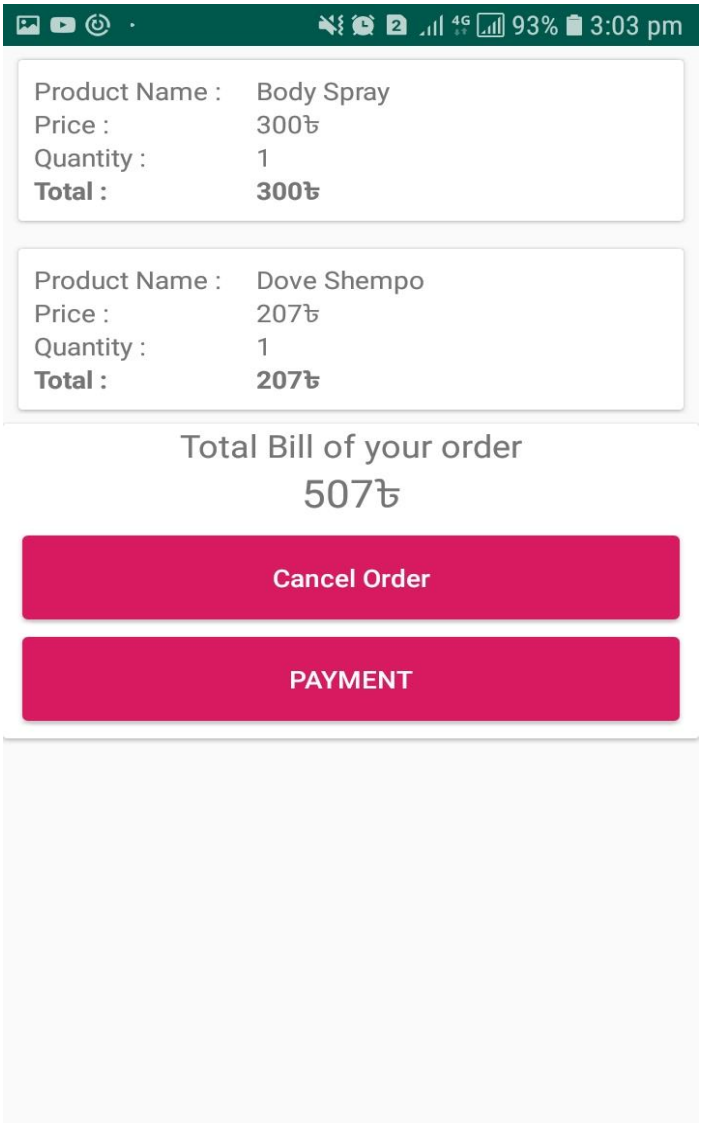


Figure 5.2.8: product order information page



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Shopkeeper can see the product status figure in below:

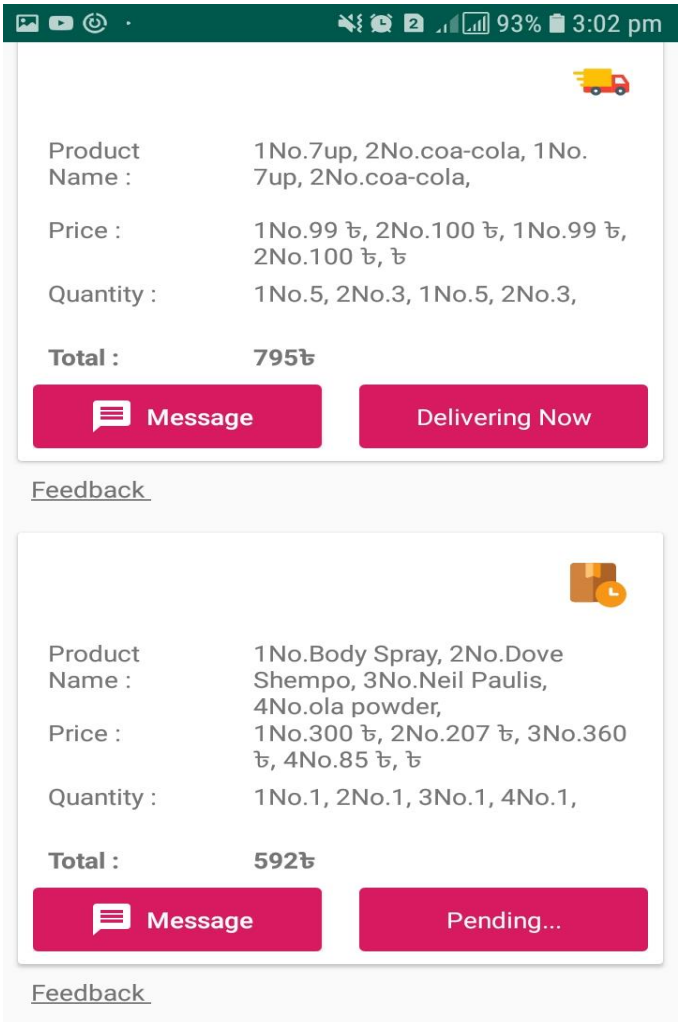


Figure 5.2.9: Product List status



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Here is an account of company information:

Figure 5.2.10: Company Home Page



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Company can advertisement this product. Here is full specification of product and shop list:

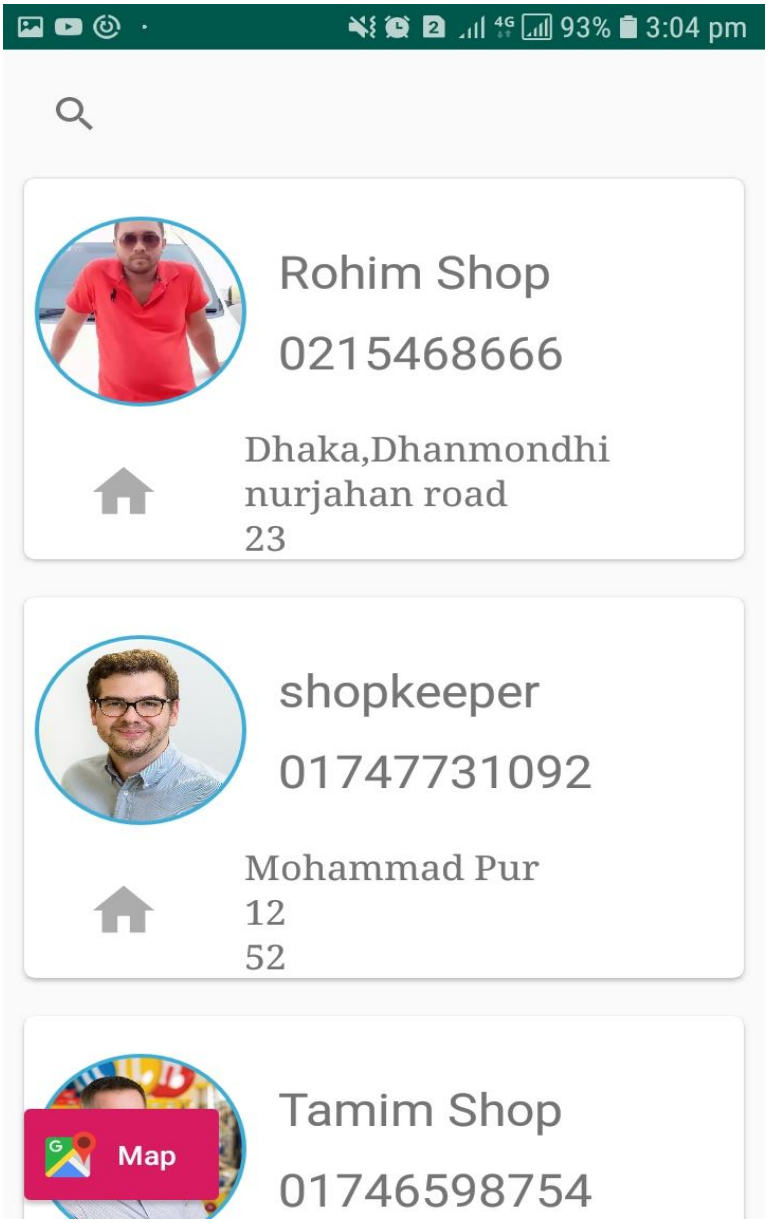


Figure 5.2.11: Shop list Page



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Company can add new product for image, name, description etc.

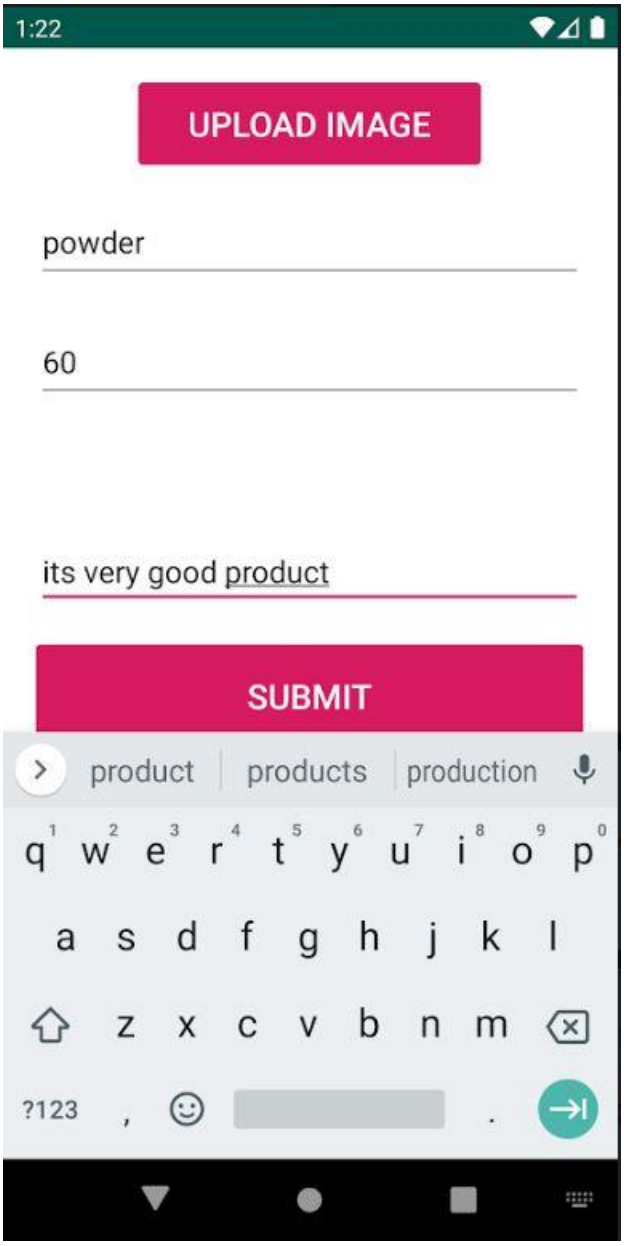


Figure 5.2.12: Upload product information page



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Company can accept order figure in below.

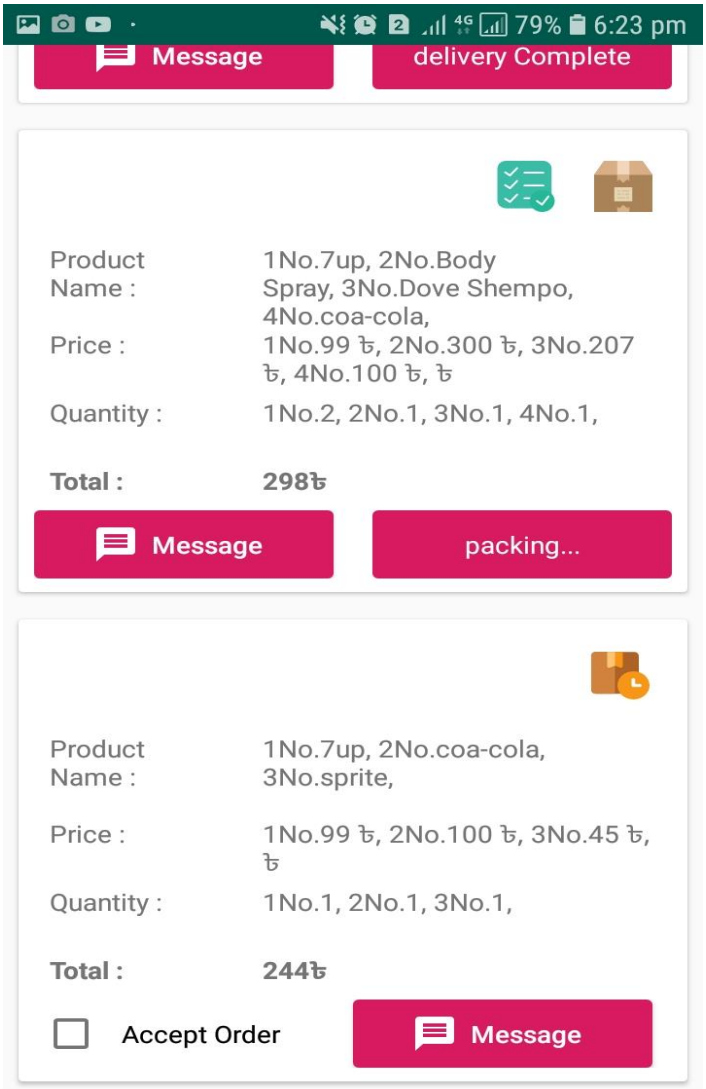


Figure 5.2.13: Accept order



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Delivery man profile in below:

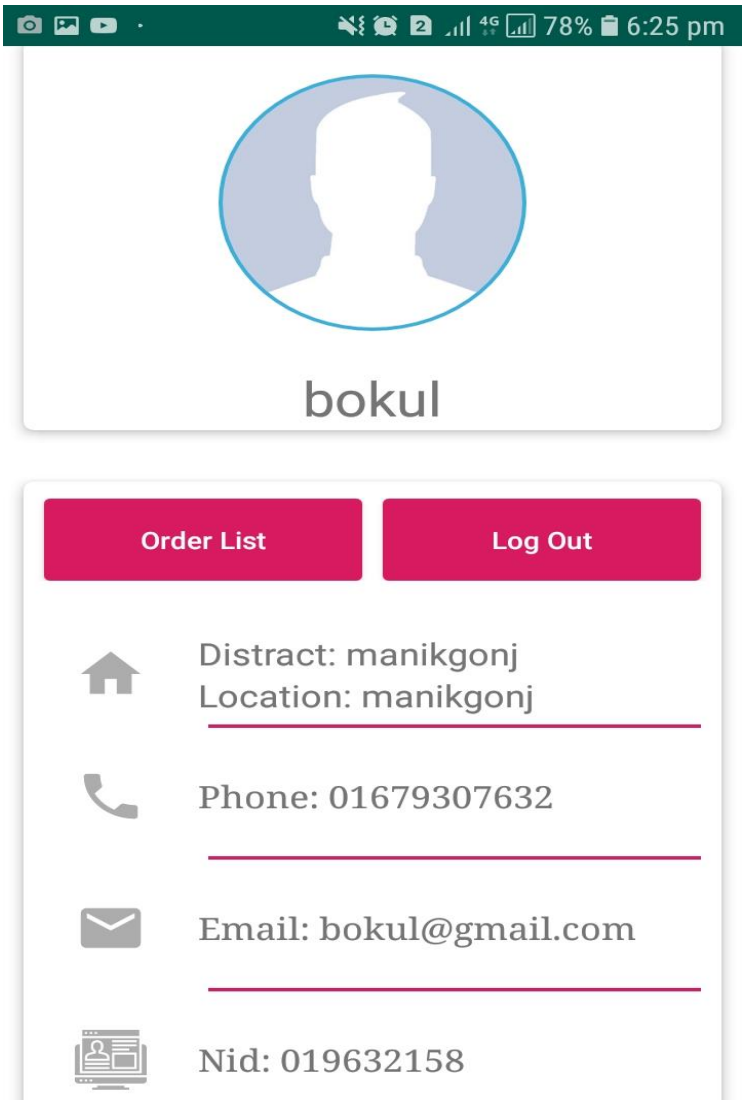


Figure 5.2.14: Delivery man profile



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Delivery Processing system figure in below:

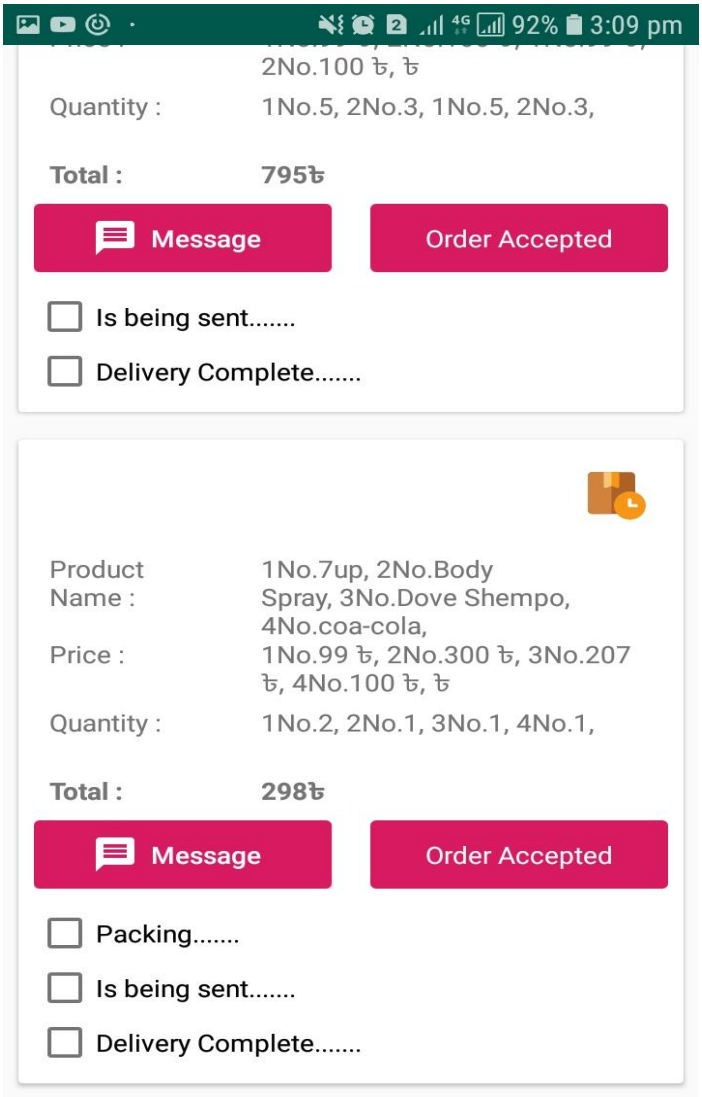


Figure 5.2.15: Delivery process System

Here is the all procedure of shopkeeper, Company and Delivery man.



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### 5.3 Implementation of Interactions

To make an app more used the app has to be more interactive. To make an app it requires some material design with a user-friendly system. For a convenient system, the design should include a good icon and a beautiful text font with some well-designed buttons. We have tried to make our application more interactive to the users. So, we made the system responsible for a better user experience by using good icons with good text font and button.

### 5.4 Testing Implementation

This is the process of testing the implementation of a system. It is a way to understand whether an application is working well as expected or not.

Table 5.4.1: Testing Implementation

| No | Tested Case | Test Input | Expect Outcome | Actual Outcome | Result |
|---|---|---|---|---|---|
| 1 | Registration | Register as Shopkeeper | To successfully Register | Registration complete | passed |
| 2 | Registration | Register as Company | To successfully Register | Registration complete | Passed |
| 3 | Sign-in | Enter email and password to enter the system | To enter the System | Entered the system | Passed |
| 4 | Sign-in | Enter non-registered email and password | To not let in the system | Didn't enter the system | passed |
| 5 | Upload Pictures for product | Select Picture and Upload | To show Pictures | Picture shown | passed |



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| | | | | | |
|---|---|---|---|---|---|
| 6 | Searching for shop list through maps | Input area | To show related area | Related area shown | Passed |
| 7 | Searching For order list | Search order name | To Show Order list | Order name shown | Passed |
| 8 | Receive and accepting order | Select product and order | To show voucher | Total amount show | Passed |

### 5.5 Test Results and Reports

We have checked our application to find out whether it works as we expected or not. So, the testing results will make us understand the limitations of our system and help us to improve it. We tried to test every function we used in this app to make the app a successful one. We have tested our Smart Field Service app many times with different android phones to check that it works successfully or not. And finally, it worked perfectly as we expected on every device.



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# CHAPTER 6

# Conclusion and Future Scope

## 6.1 Discussion and Conclusion

Now-a-day it is the era of digitalization. By making this app we are digitalizing the communication system among shopkeepers, and companies where delivery men are working as a linker which helps them to save time. Facility of our application is to shopkeeper can order product, find easily company, within a short time and the company can deliver the order to the shopkeeper, the company also can advertise their product and find the shop easily using map.

## 6.2 Scope for Further Developments

We have also plan for further improvement and adding more features in this app such as:

- Company will be given permission to use Apps through license number verification.
- To use the application, need to verify the NID in future.
- In the future, customer will be tired of being added to these apps so they can find out what kind of product they have in store.
- Google map for more accuracy of locations
- Add Shopkeeper report system.
- By this app we are plan deliveryman job system.



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# APPENDIX

## Appendix A: Project Reflection

This is about project reflection. From spring 2019 we have started our journey to make our application.

The main Facility of our application is to shopkeepers can order products, find easily company, within a short time and the company can deliver the order to the shopkeeper, the company also can advertise their product and find the shop easily using map.

This app also another facility for shopkeepers and companies can instantly talk to each other about their product, time and date by the online messaging system. Firstly, we build a flowchart model of our application to understand how it will flow step by step and after much hard work and spending time behind it finally we reached our destination.

This “Smart Field Service” app will be very useful for both the Shopkeeper and Companies. And as our application is comparatively better than other similar applications “Smart Field Service” will be very helpful application for both.

## Appendix B

**Combination and Acronyms:**

APK: Android Package Kit

ADB: Android Developer Bridge

AVD: Android Virtual Device

ADK: Android Development Kit

API: Application Programming Interface

JDK: Java Development Kit

UX: User Experience

UI: User Interface

XML: eXtensible Markup Language



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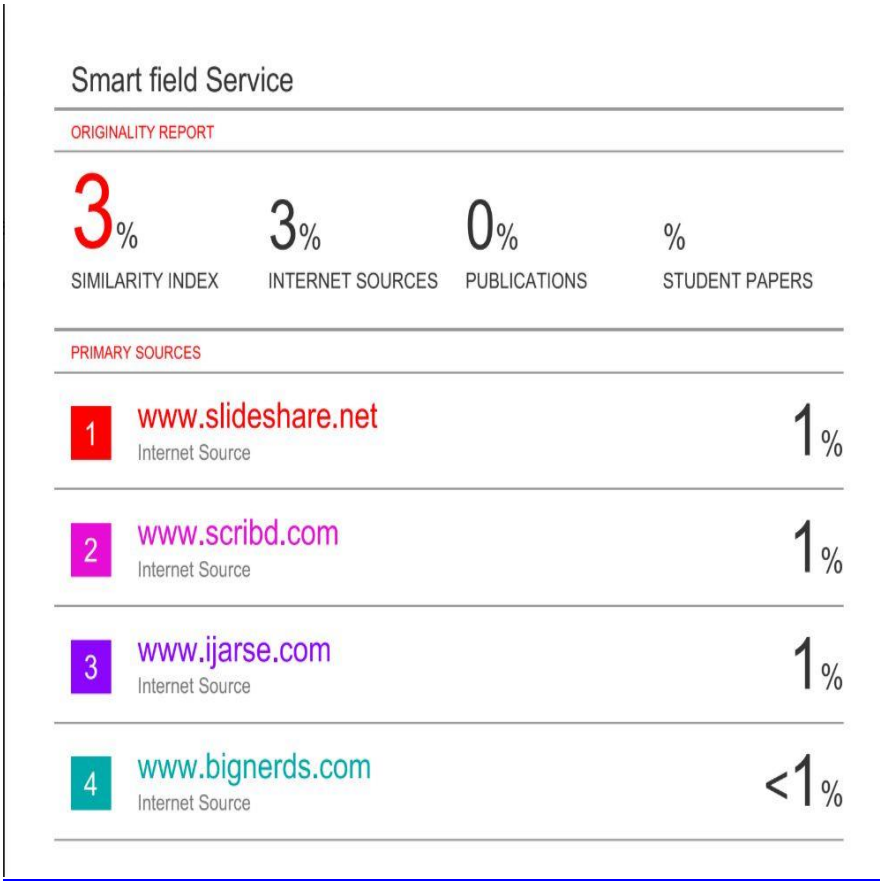
# Plagiarism Report



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