ANDROID APPLICATION ON CHECKING MEDICINE INFORMATION

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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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DHAKA, BANGLADESH

DECEMBER 2020

APPROVAL

This Project/internship titled **"your title"**, submitted by Name, ID No: 100-15-1111 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 date.

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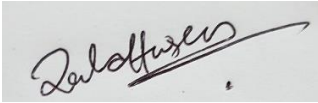Daffodil International University

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Zahid Hasan, Assistant Professor, 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.
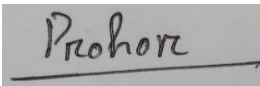
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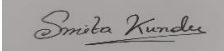Daffodil International University

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ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to **Md. Zahid Hasan**, **Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "*Mobile Application(Traditional)*" to carry out this project. His endless patience ,scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to Md. Zahid Hasan, Dr. Sheak Rashed Haider Noori, and Head**,** Department of CSE, for his 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 our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Medicine is an important part of our daily life. We depend on medicine to cure us whenever we get sick. But what happens if this medicine is fake? What if some dishonest shopkeeper sells us fake medicine for earning a profit? The manufacture and expiry date is also an important fact. All of this can create confusion in general people. These general people are important for all kinds of business. So we have to ensure the best products and the best quality. We have to bring some things to them so that they can easily identify the real product and spend their money properly. Our government is also trying to prevent the buying and selling of fake products. We developed this android software to help the general people and the government. People can easily understand the user interface. And so people will love to use this software. We try to make it easy for a user. We also keep an option for shopkeepers so that they can check the whole sell product easily. People can check data in two ways, one is a decimal number system and the other is a QR code scanner. This software data is realistic and pointed. This data will help the people to identify their needed data easily.

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CHAPTER 1
Introduction

1.1 Introduction

When we hear the word medicine, one thing comes to our mind that it will cure our diseases. Some people need to take medicine regularly. Some people need them to cure temporary diseases or health issues. People trust medicine as much as they trust the doctors and so, they need to trust the shopkeepers also. Any dishonest shopkeeper can take more than the authorized price, can sell expired medicine. So, we thought we would develop an android software, through which people can access the government authorized medicine details directly. The price, production date, expiry date, type, details of the medicine, the company that produced the medicine, people can find all these things in one place. Fake medicine is also a problem for general people. This software can help identify these fake medicines. So, even when buying a single strip of medicine, people can learn everything about that strip using this software. So, this will be more beneficial for people, and they won't be cheated.

1.2 Motivation

Health is wealth. So, when people have health issues or diseases, they want to cure themselves as quickly as possible. Doctors and medicine are what helps them. We realized that the prices of the same medicine often vary in different shops. People often consume medicine without knowing any details or side-effects of it. Fake medicine also causes harm to people. Unauthorized shops sell expired medicines, fake medicines, and also medicines at a higher price. It will be better if the government can monitor them. So, we wanted to develop an android software that will help in all the above cases. These problems that peoples face every day motivated us. We wanted to help people knowing about authorized medicine prices, identifying fake medicines. Also, to provide medicine details like company name, type, general use, side-effects, production date, expiry date. Only authorized shopkeepers can register in this software so, to help remove unauthorized shopkeepers.

1.3 Objectives

We wanted to develop software that will help people when buying medicine. To develop this software our main objective was collecting data. We needed a huge amount of data to make this software work. For our first objective, we need to collect medicine codes from the company database to identify fake medicine. This is a difficult task because companies won't give access to their database unless they trust our app. The second objective is collecting medicine-related details like prices, type, general use, side-effects, production date, expired date from the companies.

1.3 Expected Outcome

The expected outcome of this software is to provide an android framework with a user-friendly interface. And to provide people authorized medicine information.

1.5 Project Management and Finance

To develop this software, we used Android Studio. Android Studio is the IDE for Android app development. IDE stands for Integrated Development Environment. To design the User Interfaces of our software, we used Adobe XD. And we used the Cloud Firestore database for our software database. All of these are open-source, so developing our software didn't require any money.

CHAPTER 2
Background

2.1 Preliminaries:

The weather changes every day and diseases are increasing day by day. The demand for doctors and medicine are also increasing. Doctors are treating patients in a very good way. But the problem arises that like Bangladesh many other developing countries face fake medicine problems. So, the patients are facing many problems and losing their money. After seeing this we thought about how to solve this problem and give people authorized products at an appropriate price. So, we tried to develop a project which can identify real medicine and show medicine details.

2.2 Related Work:

Medicine App Bangla

Figure 2.2.1: Medicine App Bangla Home Page (Class Nodes BD, Medicine App Bangla, home page)

This app mainly shows medicine details like how to take a medicine, amount to take, side-effects, materials used to make the medicine, and 500+ medicine information, etc. It also

shows details of some viruses, some medical herb names, and details, what disease requires what medicine, etc. Medicine names are stored from category A to Z and by selecting a name we can see the details of that medicine.

Medicine Guide:
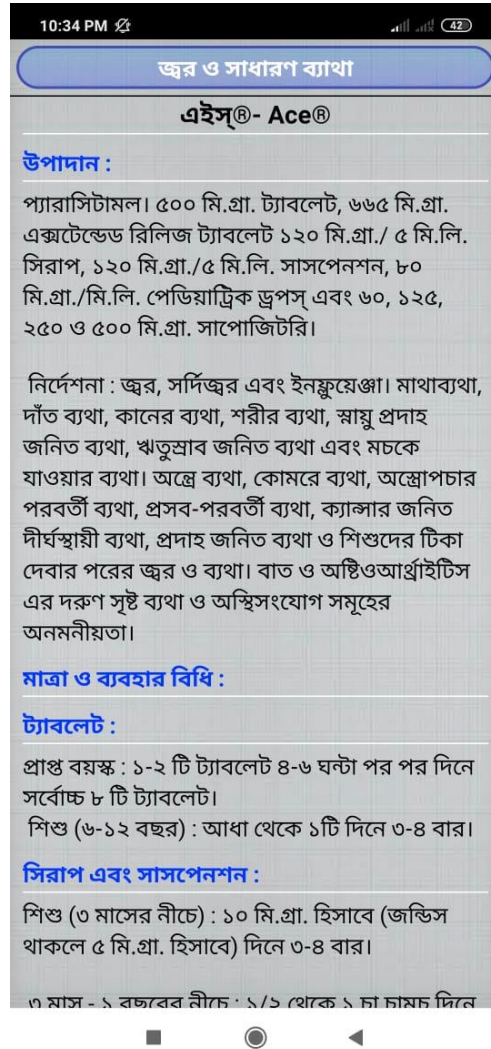
Figure 2.2.2: Medicine Guide App medicine details page (BD Apps Station, Medicine Guide, details page)

This is a Bengali app and everything written inside is in Bangla language. This app has a list of diseases inside. When we click a disease button, it shows a list of medicine that can be used to cure that disease. Then again, if we click on a medicine name, it shows medicine details. The details are the amount of medicine for people of different ages, some cautions

to use it, side-effects, etc. So, this app is mainly developed to provide medicine details with the name of diseases that it can cure.

Drug Dictionary:
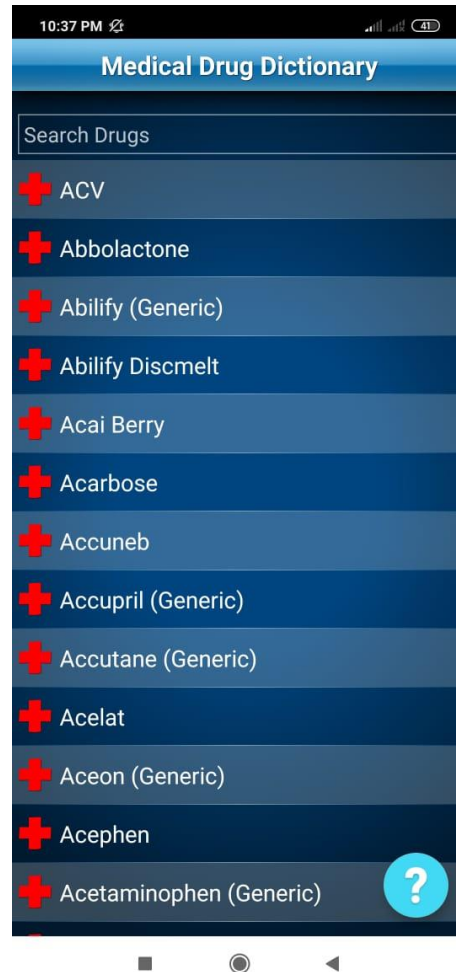
Figure 2.2.3: Drug Dictionary home page (Atumic Infoapps, Drug Dictionary, home page)

This app has a long list of medicine and its details. When we start the software, the homepage shows the list of medicine starting from A to Z. There is a text field for the search option to search for a specific medicine. If we click on a medicine name, it takes us to the next interface. There we can find medicine details: About, Uses, How to Take, Side Effects, Precaution, Drug Interactions, Missed Dose, Storage. It is an app that helps people know about medicine details.

Drugbook
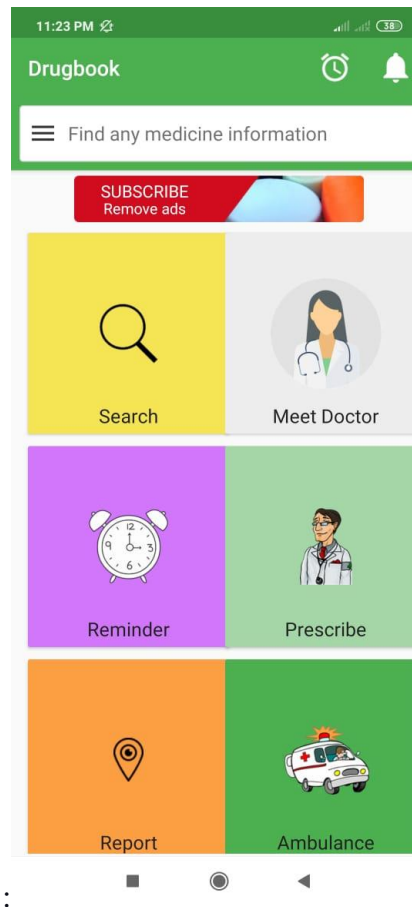
Figure 2.2.4: Drugbook home page (Hail Date, Drugbook- All Medicine Guide, home page)

This app has six features. Number one is a search option. When we search for medicine, the app shows Similar medicines, Indication, Precaution, Contra Indication, Dose, Side Effect, Mode of Action, Interaction, etc. It also shows Generic, Brand and Company of the medicine. Other features are Meet Doctor, Reminder, Prescribe, Report, and Ambulance. The reminder option helps to add a reminder when to take medicine. The ambulance option uses Google Maps to locate people and contact an ambulance in an emergency.

2.3 Comparative Analysis

We are showing details of medicine like name, type, manufacturing materials, company, and use of the medicine. Other apps also show this type of detail. Our apps show the production date and the expiry date of a medicine other apps don't show that. We are showing the product price but other apps don't do that. So, this app is more effective than others. We are using a decimal code and a QR scanner to identify the real medicine. Others don't do this. We don't show any doctor details or contact in our application. But there some other apps which have this feature.

2.4 Scope of the Problem

A problem may arise if the government doesn't want to share the medicine database. When a shopkeeper checks or scans any medicine, that medicine will be registered alongside his name. Another problem may arise if the Shopkeepers don't want to register the medicine.

2.5 Challenges

Data collection is the main challenge for this project. There no database in our country for the medicine so we have to make a database for medicine by the help of government. Data maintenance is also another big challenge because these data are changeable. For this reason, we have to test and maintain software continuously. Apps should be bug-free and smooth so that people can easily use this software.

CHAPTER 3

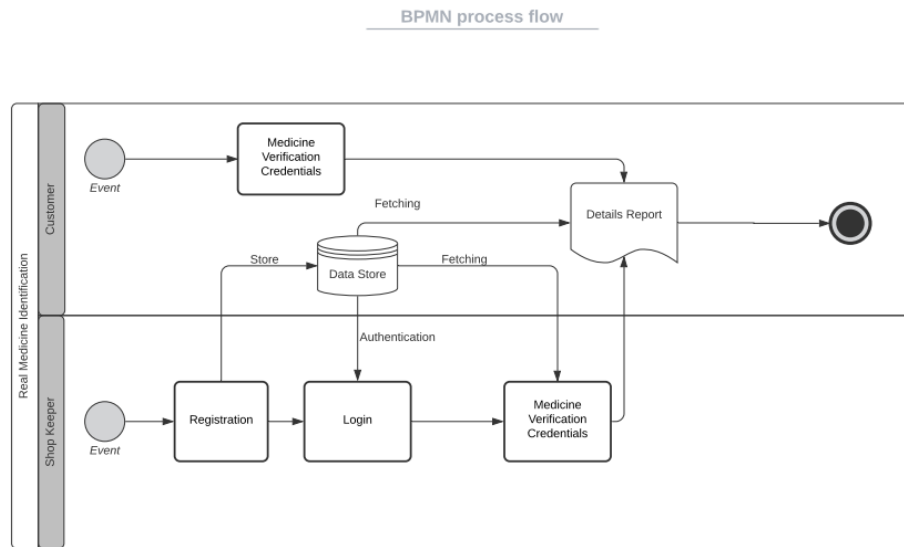# Requirement Specification

3.1 Business Process Modeling

Figure 3.1.1: Business Process Model

3.2 Requirement Collection and Analysis

Requirement collection and analysis is one of the most important elements for any kind of app development. So, we tried to find out the requirement of the customers. In this app, we saw that users only need information about the medicine. Display medicine information we need a unique number. And a database where we can store the information or data. On the other hand, the shopkeeper also needs a login option so that he can create an account by using his license number. And check the medicine information. In this situation, we also need a database to store the data. So, we analysis the database problem and we found out the Cloud Firestore database which can solve both of our problems. After that, we found out the feasibility of this app. We saw that people are so much conscious about medicine.

And most of the people are buying medicine for their family members. But they don't know about this medicine. So, if we can give them an app to check the medicine, they will be sure about the medicine quality. So, there is a big opportunity for this app. The last and important requirement is economic and technical support. Here we use Adobe XD for design, android studio, and google database all of them are free. But in the future, we have to use a government medicine database so there will be some official issue.

3.3 Use Case Modeling and Description
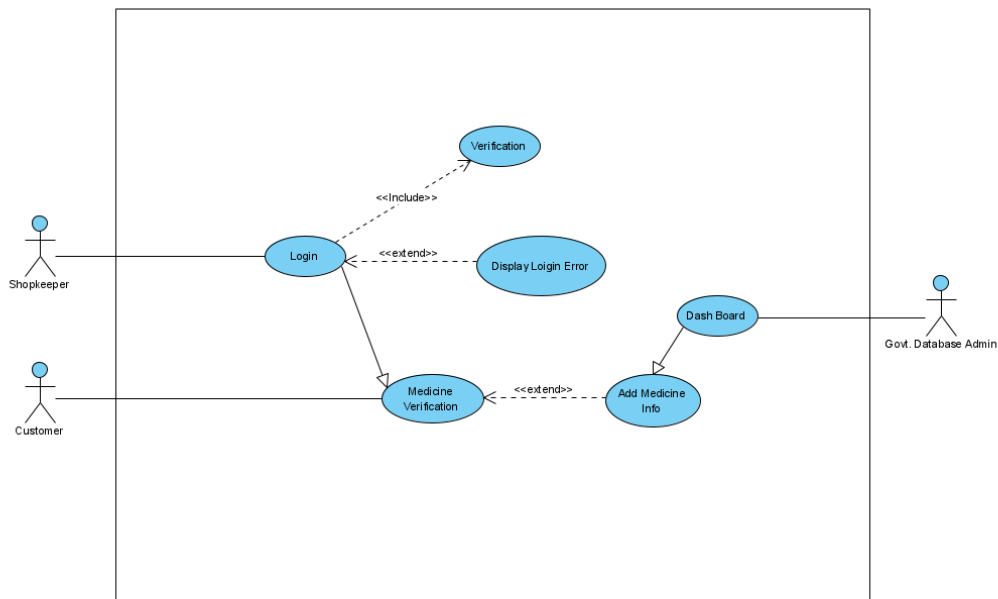
Figure 3.3.1: Use case Model

In the use case model, there are two actors, one is the shopkeeper and the other is the customer. The shopkeeper needs to login with the help of a license number. After that, he needs google OTP as a verification code for further login. After that, he can verify the medicine. If he can't give the OTP that time, he will face a login error. In the future, we will store the data which he checked by using his id. For Customers, there is no need for a login option. They only enter the verification code and check the details. We provide this data from the database.

3.4 Logical Data Model

Figure 3.4.1: Logical Data Model

CHAPTER 4

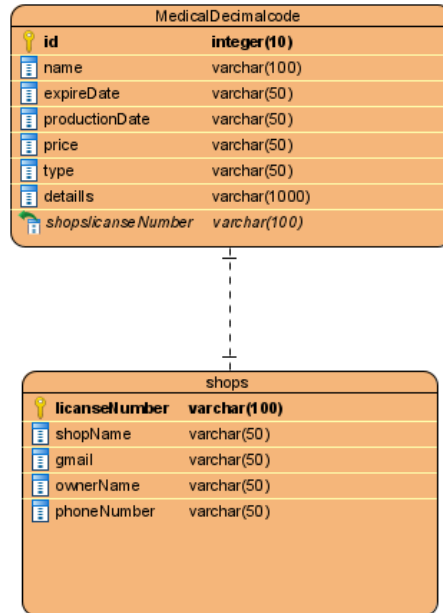# Design Specification

4.1 Front-end Design

User-interface or UI is the first thing that people see when they open software. The first impression is the main thing for any product or software.
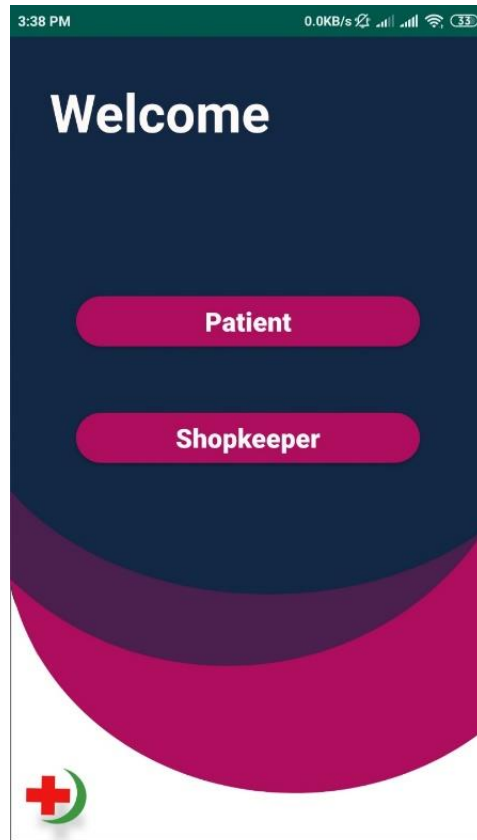
Figure 4.1.1: UI home page

Figure 4.1.1 will provide that first impression of our software for the people. On that mind, we tried to make this software first look glossy and bold. So, we used a smooth combination of white, dark blue, purple, and magenta colors, which makes the user interface attractive. We welcome the user warmly by using this home page. In this user interface, we used two buttons and a text view. One button is used for patients or customers, and another one is used for the shopkeeper. By clicking the patient button, the customer enters the next page which is a verification page where he/she can verify the medicine. On the other hand, by clicking the shopkeeper button a shopkeeper will go to the next page which is a login page. Here he can check the medicine and register the medicine by his shop name.

People will download this software to verify if the medicine is fake or safe to use. People may also want to check the production date and expiry date. Details and companies are important for any medicine. People can learn about the details like name, type, company, materials, price, etc. from this software. Checking the details of medicine is the main purpose of this software.

In figure 4.1.2 we use mainly two-button and an edit text. One Button is used for QR code scanners and the other one is decimal number identification. And the edit text contains the decimal number. For example, 123456 is a decimal number and that will be printed on both sides of the medicine strip. Customer and shopkeeper both can enter the decimal number on the edit text field. Then click the verify button to identify the real medicine.
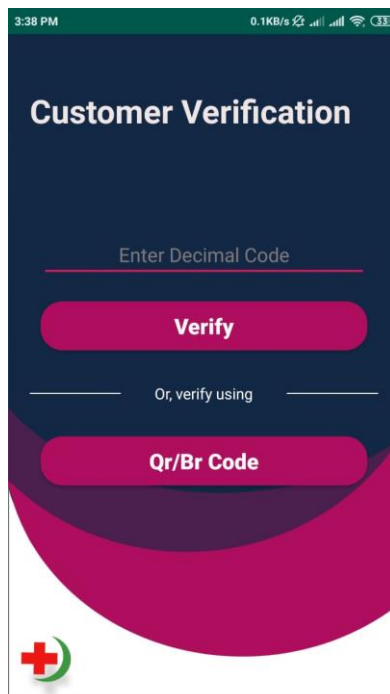

Figure 4.1.2: Verification Page

The software will not only identify the medicine but also will show the details in a new interface. Where we can't use decimal numbers, we can instead use the QR scanner. That will make the identification process quicker.

Medical shops play an important role in our society. We can find a medical shop in almost every corner of the city. Some shops are government registered and some are not. People believe that unregistered shopkeepers sell fake medicine to consumers.
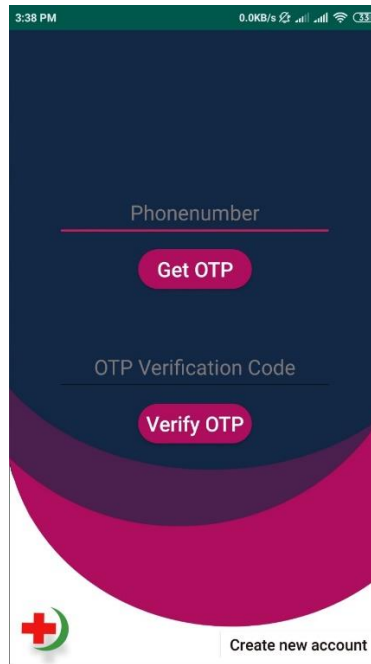
Figure 4.1.3: Shopkeeper Login Page

This software will keep track of which medicine was delivered to which shop keepers. In the future development, if any registered shopkeeper checks or scans any medicine, that medicine will be registered alongside his name.

In figure 4.1.3, we can see the shop keeper log in system. We used three buttons and two edit text in this interface. We tried to move from the regular login system, so we introduced the OTP system. Here, the shopkeeper enters the phone number and gets the OTP through message. If the software and the phone sim card number is on the same phone, then he will automatically enter the software.

If the software and the phone sim card number is not on the same mobile, this will not create any problem. Because there is a second option. He can get the OTP verification code from the message and type it in the OTP verification edit text box. Then click the verify OTP button and enter the software main program.

If the shopkeeper is new to using the software and doesn't have an account, then he can create a new account. For every account number, we mainly focus on the license number. If the shop is not registered and the shopkeeper does not have a license number, then he cannot create a new account. For further development, we will need a government license database. Hopefully that time nobody will be able to open a medical shop without a license.
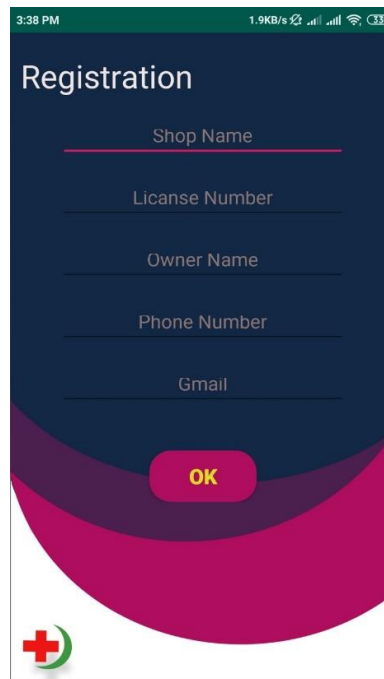
Figure 4.1.4: Registration Page

On this page (figure 4.1.4), shopkeepers will create an account and use that for identification. They mainly give us some basic information. Mainly we look after the license number because that is a unique number. And this is authorized by the government. So, they will be looking after by the government and the government can monitor them

easily. We mainly use edit text for collecting data, a button to control the edit text, and a scroll view.
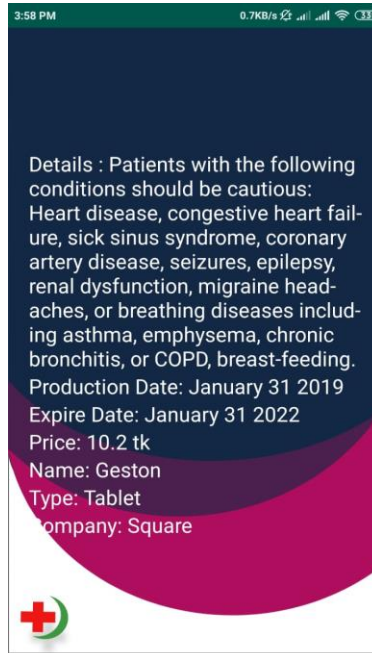
Figure 4.1.5: Result Activity

For identification, we need some data which was stored in the database. We store data in the database and retrieve data from the database. For practice purposes, we use firebase " Cloud Firestore " in this project. when we search for any kind of data if it is valid that time we see the interface like figure 4.1.5.
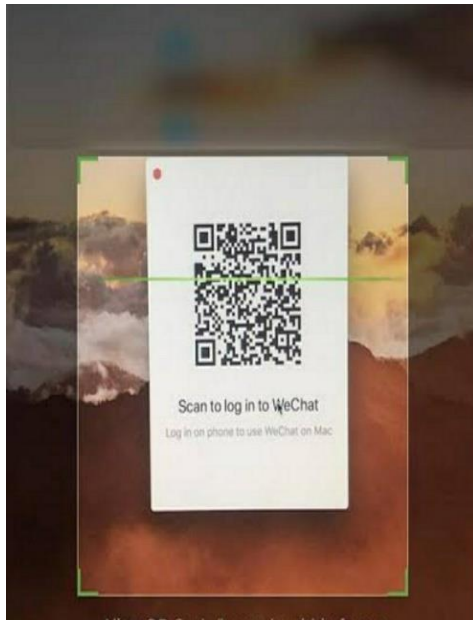
Figure 4.1.6: QR scanner

We use the QR code scanner to make it easy and faster. So that people can easily scan the products and save time. Mainly shopkeepers like to use QR code scanners. Because in the short time they can check many products. Even where we can't use the decimal code there we try to use a QR code scanner. Figure 4.1.6 shows the QR code scanner**.**

4.2 Back-end Design
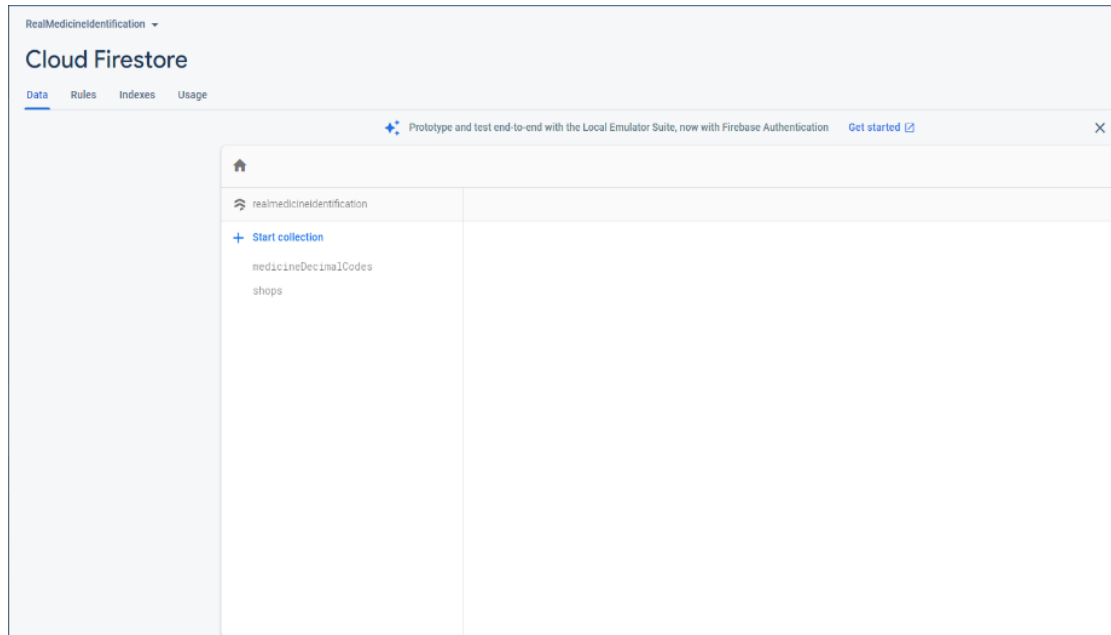
Figure 4.2.1: Cloud Firestore

In this project, we use google firebase "Cloud Firestore" as a database. This database makes our software look more realistic. Cloud Firestore combines both the firebase and googles cloud. Since it combines the experience of a firebase "Realtime database" and the scalability of the google cloud platform, it has got both of their benefits. This database is serverless and provides a great developer experience. App development is simple, and there is no need to set up an intermediary server to manage the data. This database offers excellent data handling capability. This database data is so much secure than others. If any maintenance problem or disaster happens data remain secured and available. This database can work offline, the data is saved as cache in device memory. After reconnecting data will be synchronized. This database provides real-time access to data across different platforms.

Figure 4.2.2: Medicine Information

Figure 4.2.2 shows the Cloud Firestore database. Here we have two types of collection. One of them is Medicine description. Here the database stores some details about the materials of medicine, price, which company makes it, etc. Expire date, and production date is also stored here.
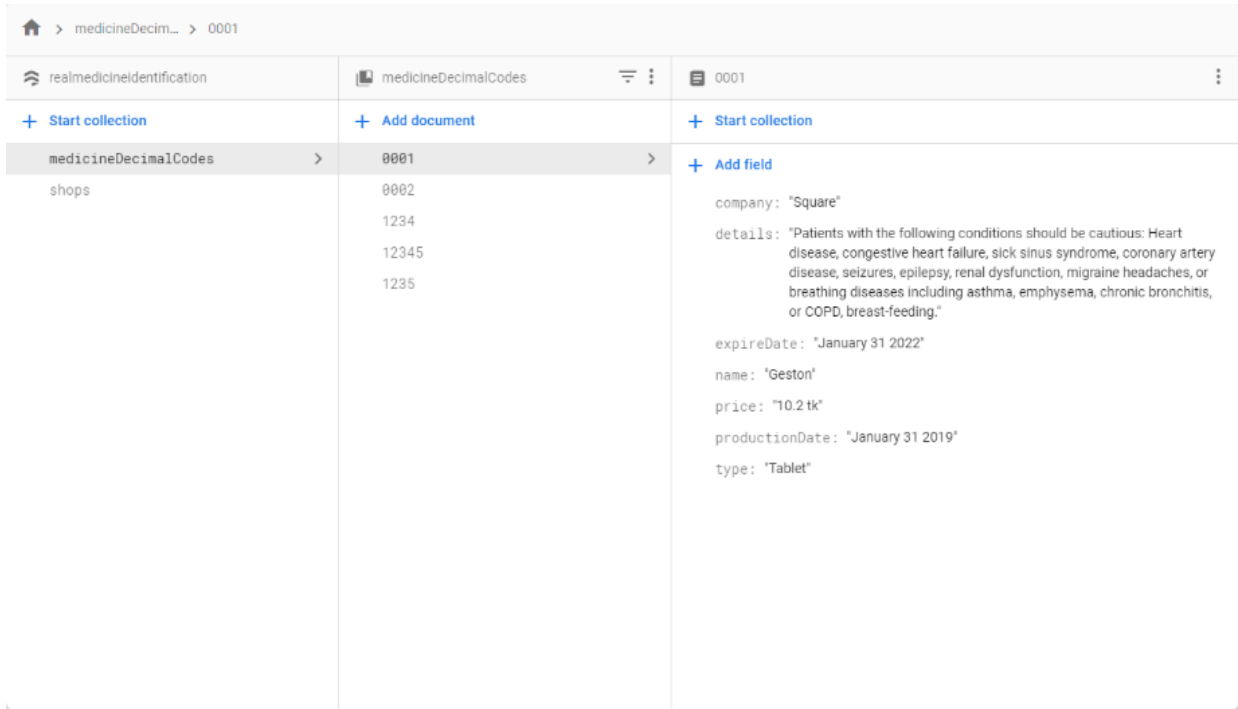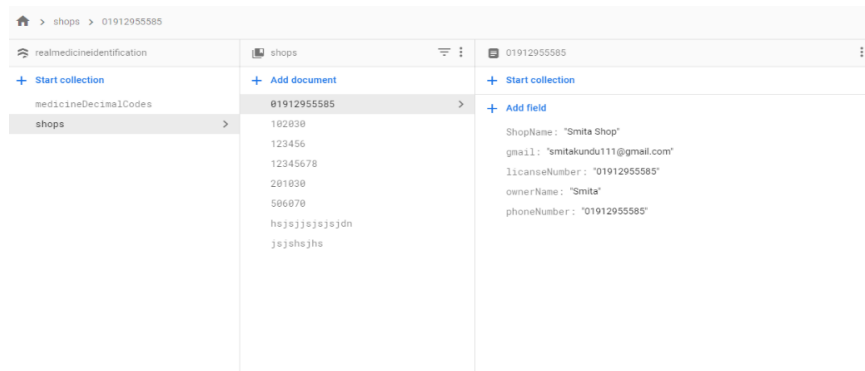

Figure 4.2.3: Shop details

Figure 4.2.3 shows another part of the primary Cloud Firestore database used in the software. Here we have two types of collection. This part shows the shop's description. Here database store all kind of shop information what we can use for maintaining the whole process. This information is the shop name, Gmail, license number, owner name, phone number.

4.3 Implementation Requirement

We developed an android based project where we can identify the real medicine and its details. We identified some implementation requirements before starting working on this project. Our first requirement was to identify the users who will use this app and its user functionality. After that, we had found two types of users who will use this software. Number one is patient or customer and the other is shopkeeper. The second requirement was how they could interact with the app. The third requirement was, to help people interact with the app, how many user interfaces we will need. So, we thought about the shopkeeper's and the customer's use requirements. The fourth requirement was where we design these interfaces because these interfaces should be smooth and clear to the users. The fifth requirement was which database we can use to store the data because data functionality is very important in this app. The last and most important thing is how we can collect the data. Data accuracy is essential for this app.

CHAPTER 5
Implementation and Testing

5.1 Implementation of Database

For any project, we need a reliable and secure database. In this project, we found out a firebase database which was Cloud Firestore. This is secure and well functional. We create a firebase account and create a project for this app. After that, we connect our project with the database. After that, we wrote some code to create a table and documents.


```java
firebaseFirestore.collection( collectionPath: "shops")
        .document(rlicanseNumber)
        .addSnapshotListener((value, error) -> {
            if (value.getData() == null) {
                Map<String, String> shop = new HashMap<>();

                shop.put("ShopName", rShopName);
                shop.put("licanseNumber", rlicanseNumber);
                shop.put("ownerName", rownerName);
                shop.put("phoneNumber", rphoneNumber);
                shop.put("gmail", rgmail);
                firebaseFirestore.collection( collectionPath: "shops")
                        .document(rlicanseNumber)
                        .set(shop);

                Toast.makeText( context: ShopkeeperRegistration.this,  text: "Account created", Toast.LENGTH_SHORT).show();
                createNewAccount( phoneNumber: "+88" + rphoneNumber);
            } else {
                Toast.makeText( context: ShopkeeperRegistration.this,  text: "Account already exist", Toast.LENGTH_SHORT).show();
            }
        });
```

Figure 5.1.1: Database Data store code

In some tables, we need to enter the data. When customers want to know about any medicines data, they will see that from that table. They need to only enter the decimal code or scan the QR code. After that, they will saw the data. We also backup this data so that any kind of problem arises we can secure the data.

5.2 Implementation of Front-end Design

The user interface is important for any apps. The user interface helps the people to easily interact with the apps. So, we try to make a user-friendly interface. Nowadays Adobe XD is the most popular software to create any mobile and web application interface. So, we used Adobe XD to create the background and other design work. After creation, we add it with the android project and, it looks smooth and user-friendly. We place the button and logo with the help of the XML file.
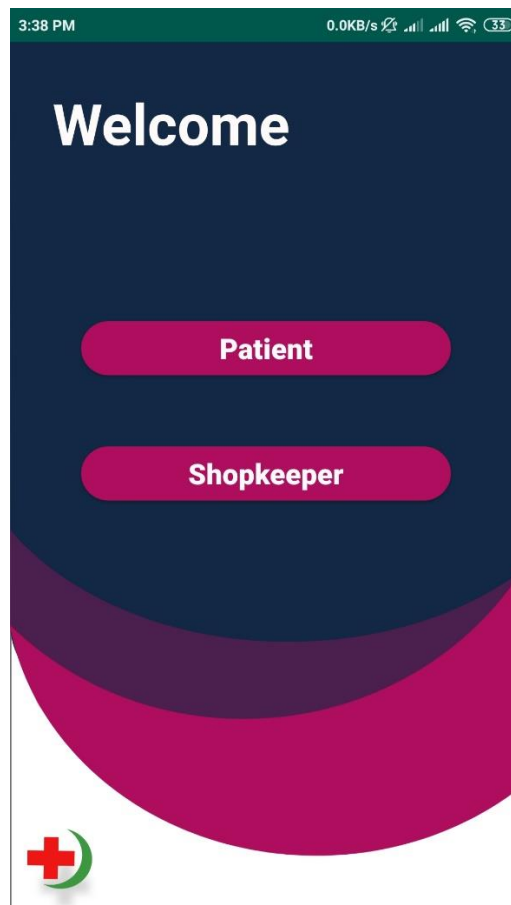

Figure 5.2.1: Front-end design

5.3 Testing Implementation

We test our apps. We test this app as a customer and a shopkeeper. Customers input the decimal number and will saw the data. So, we input different types of decimal numbers and test the app on how it responds. We saw that it shows us the data according to the database. We also check the QR code scanner. It also sows the data perfectly. We check the shopkeeper OTP field it also works correctly. When the sim card and the apps on the same mobile phone, then we can go to the verification page directly. There no need to press the OTP number. When the sim card and the apps on a different mobile phone we need to give the OTP number, then we can go to the verification page. On the registration page, we don't fix the string length, the shopkeeper can easily write his shop name. Gmail field can only take a Gmail and we fix the phone number length so shopkeeper can only input eleven digits. We check the database many times we input different types of data. After that, we check we saw that database shows a null value. So, we try to keep all the data in the same data type. It will help in the maintenance issue.

CHAPTER 6

Impact on Society, Environment and Sustainability

6.1 Impact on Society

People are all-time conscious about medicine and its quality. They buy medicine but they are concerned about the medicine expiry date and materials. If they buy good quality medicine, it will be helpful for their health. And they can spend their money properly. But If the medicine is expired, it will be harmful to their health. Even they can die also. So every medicine must be authorized. Authorized medicine maintains its material quality and safety issues, so they are good for health. This project is developed for identifying real medicine and ensure the good health of the people. Some shopkeepers are greedy, and they sell medicine at a high price. This is also a big issue. Our project can solve this issue also because we are showing the price of medicine. So, assuming it will bring a massive difference in the medicine distribution process. So, we hope this project will have a good impact on society.

6.2 Impact on Environment

Industrial development is good for any country. And it will grow their economy. Industrial development also brings some environmental pollution. Every government tries to reduce this kind of pollution and to control environmental pollution they establish different types of law. Authorized companies are bound to follow these laws. But the unauthorized companies don't follow the rules and regulations. Because of that, they pollute the environment continuously. Authorized companies are also paying taxes to the government. The government spends that money to develop the environment. But the unauthorized companies are not paying any tax, so the government faces many difficulties to develop the condition of the environment. So, we hope this project will have a good impact on the environment.

6.3 Ethical Aspects

This project stands on the ethical aspect. We try to give something to the people that they had expected for a long time. People buy their medicine but they can't check that. They try to check their medicine, but there is nothing to solve this issue. At that time, we thought that we would develop an android project and help the people. Finally, we hope that we developed an android based project by which we can solve this problem.

Now they can check their medicine, and they will pay the real price for their medicine. We hope after that the fake medicine production will be stopped. And all the shopkeepers will come into a monitoring system. So, they can't sell fake medicine. In Bangladesh, three crore people use android phones and, they are connected with fifteen crore people. So, we can say that we ensure almost 15 crore people real medicine identification problem. And now they can buy real medicine at the authorized price.

6.4 Sustainability Plan

Medicine is an essential element in our daily life. Many diseases are identified every day all over the world. And we need to find out the medicine to cure the people of these diseases. Without that, people can't survive in this world. Like that, fake medicine is also a curse for this world. People know they can be cheated easily, so they need something which can assure them about real medicine. This android app can give them authorized data about medicine. So, we can hope that if we can give them perfect data, they will depend on it. And this software will run a long time in this world.

CHAPTER 7

Conclusion and Future Scope

7.1 Discussion and Conclusion

This android-based software is going to help people to buy medicine more effectively. They can check the price of the medicine online so they won't get cheated. They can also check the production and expiry date of the medicine. These dates will be shown directly from the government database. So, dishonest shopkeepers cannot sell expired medicine even if they want to. The medicine helps people cure diseases, but expired medicine will harm people instead. We will also show the details of the medicine and its side effects. So, people will know what they are consuming. This software will also help to identify fake medicine. So, overall, we hope this project will bring people benefit.

7.2 Scope for Further Developments

We hope this software can also play an important role in our economy. To do that, we have to develop the software in the right way. In the future, we can develop this software. So, the Government can monitor the medicine stock in a particular area. When the shopkeeper checks the medicine by his license number, we save the data in his id. When he sells the medicine, we will automatically reduce the amount of medicine from his id. So, the shopkeeper can't stock more medicine than they are supposed to. By doing that, we can balance the market and analysis of the medicine selling rate in our country. Also, companies can't produce more medicine than is required. Because they have to give the serial number to the government and the government can receive the tax easily. We also want to add a complaint option about the medicine shop and medicine. So the shopkeeper and the companies will always be aware.

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