

GREEN MEDIC: ANDROID BASED MEDICINE ORDERING SYSTEM

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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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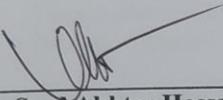
DHAKA, BANGLADESH

DECEMBER 2019

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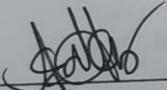
This Project titled “**Green Medic: Android Based Medicine Ordering System**”, submitted by Raqibul Hasan Rahat, ID No: 161-15-7014 and Md. Hasnain Habib Rakin, ID No: 161-15-7379 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory 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 7th December, 2019

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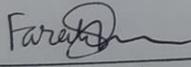
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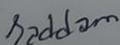
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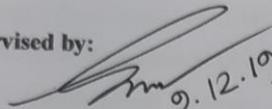
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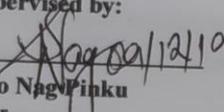
We hereby declare that, this project has been done by us under the supervision of Zerine Nasrin Tumpa, Lecturer Department of CSE Daffodil International University. We also declare that neither this project nor any part of this project has been submitted anywhere else for award of any degree or diploma.

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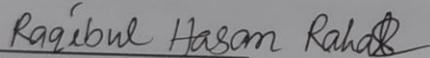
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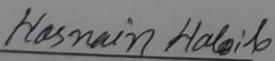

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ACKNOWLEDGEMENT

First, we express our heartiest gratitude and thankfulness to almighty God for His perfect gifts, making us conceivable to finish the last year project /internship successfully.

We are really grateful and wish our profound indebtedness to **Zerin Nasrin Tumpa, Lecturer**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of Android to carry out this project. Her perpetual tolerance, insightful direction, persistent support, steady and enthusiastic supervision, productive analysis, important guidance, perusing numerous inferior drafts and adjusting them at all stage have made it conceivable to finish this project.

We would like to express our heartiest thankfulness to the Almighty Allah and also thankful to **Syed Akhter Hossain** the head of the department of CSE for his kind help to finish our project and also to other faculty members and the staffs 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 discussion while completing the course work.

At long last, we should recognize with due regard the consistent help and patients of our beloved parents.

ABSTRACT

Green medic is an online medicine delivery system software that will provide medicines to the customers at their doorstep. It enables the customers to order medicines online from the comfort of their homes, get delivery within a short period time. Our proposed system is striving to make medicine delivery simple and accessible. There are several websites which do similar task but those are not so efficient. This application will reduce the hassle of buying medicines for the patients or customers. This application makes a bridge between the customer and the pharmacy. Customers have to select location, request for necessary medicines and get accepted by the nearby pharmacy or their desired pharmacy and get their medicines delivered at their doorsteps.

TABLE OF CONTENTS

CONTENTS	PAGES
Board of examiners	i
Declaration	ii
Acknowledgement	iii
Abstract	iv
CHAPTER	
CHAPTER 1: INTRODUCTION	1-3
1.1 Introduction	1
1.2 Motivation	2
1.3 Objectives	2
1.4 Expected Outcome	3
1.5 Report Layout	3
CHAPTER 2: BACKGROUND	4-7
2.1 Introduction	4
2.2 Related Works	4-6
2.3 Comparative Studies	6
2.4 Scope of the Problem	7
2.5 Challenges	7
CHAPTER 3: REQUIREMENT SPECIFICATION	8-13
3.1 Requirement Collection and Analysis	8
3.2 Use Case Modeling	9
3.3 Entity Relation Diagram	10
3.4 Flow Chard	11
3.5 Business Process Model	12
3.6 Design Requirements	13

CHAPTER 4: DESIGN SPECIFICATION	14-16
4.1 Front-End Design	14
4.2 Back-End Design	14
4.3 Interaction Design & UX	15
4.4 Implementation Requirements	15
CHAPTER 5: IMPLEMENTATION AND TESTING	17-26
5.1 Implementation of Database	17
5.2 Implementation of Front-end Design	17-24
5.3 Test Results and Reports	25-26
CHAPTER 6: CONCLUSION AND FUTURE SCOPE	27-28
6.1 Conclusion & Discussion	27
6.2 Limitations	27
6.3 Scope for further future work	28
REFERENCES	29
APPENDIX	30-31
APPENDIX A: Project Reflection	30
APPENDIX B: Related Diagrams	31
PLAGIARISM REPORT	

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.2.1: Use case of Customer and Pharmacy	9
Figure 3.3.1: Entity Relationship Diagram	10
Figure 3.4.1: Flow Chart	11
Figure 3.5.1: Activity Diagram	12
Figure 5.2.1.1: Create Account (Customer)	16
Figure 5.2.2.1: Login (Customer)	17
Figure 5.2.3.1: OTP	17
Figure 5.2.4.1: Navigation Bar	18
Figure 5.2.5.1: Order History	18
Figure 5.2.6.1: Pending Orders	19
Figure 5.2.7.1: Create Order	19
Figure 5.2.8.1: Order Medicine	20
Figure 5.2.9.1: Find Pharmacy	20
Figure 5.2.10.1: Create Account (Pharmacy)	21
Figure 5.2.11.1: Login (Pharmacy)	21
Figure 5.2.12.1: List of Pending and Accepted Orders	22
Figure 5.2.13.1: An Order Checking List	22
Figure 5.2.14.1: Order Location	23
Figure 5.2.15.1: Confirming Delivery	23
Figure: Flow Chart of Green Medic application	32

LIST OF TABLES

TABLE	PAGE NO
Table 1: Comparative Studies.	6
Table 2: Beta Testing of customer application	24
Table 3: Beta Testing of pharmacy application	25

CHAPTER 1

INTRODUCTION

1.1 Introduction

In the modern world, living beings are suffering from various kinds of diseases due to their lifestyle habits. Today, medicine is the first aid preferred for every disease. The usage of medicine is being practiced from prehistoric times to the present. It is an ancient thought of development in the medical world.

As the world is seeing a demographic turnaround with a huge shift of population from rural to urban areas, this has resulted in an upsurge in the use of progressive technologies. Today, everyone wants things on the tap of their fingers.

So, we focused on making the medicine delivery system easy, so that people can buy medicines anytime from anywhere by the tap of the fingers. Our idea of making this app came just by seeing the hassle of buying medicine in emergency situation. We basically focused on old people who live alone. A regular patient needs regular medicines but if the patient is old enough then it will be difficult for her/him to buy medicines in a critical situation. Sometimes we don't get the prescribed medicines at our nearby pharmacies; in that case we need to search physically for the medicines. This is a time and energy consuming process to buy medicines. So, we decided to bring everything in one platform.

So, this is why, Green Medic is to help people buying medicines at any emergency situation or at any time without any hassle.

1.2 Motivation

Medicines are chemicals or compounds used to cure, halt, or prevent disease. Every single person takes medicine to improve the health condition and prevent disease and when people get older medicine becomes a necessity on daily basis. Older people cannot go outside to buy medicines regularly or if one needs medicine or any medical service in an emergency situation, they have to go out to get these things.

So, if we can make something that helps people to get medicines or medical services at home just by clicking, then we can easily avoid the hassle which will eventually make our life easier.

1.3 Objectives

- To support elder people so that they can buy medicines or get any medical service easily.
- Reduce the hassle of transportation to get medicines or services.
- To support people in the emergency situation by providing emergency medicines.
- Making user interface easy for different types of users.
- Easily accessible.
- Give fast delivery at doorsteps.
- Getting medicines from desired medicine store.
- Provide 24/7 service.

1.4 Expected Outcome

People at times don't find their prescribed medicines at nearby pharmacies; in that case they can easily find and select pharmacy manually and order medicines from that large medicine store where the medicines are available. Besides, it's user app and pharmacy app are very easy to use and easily accessible. The interface of both apps is very user friendly. People can easily use the features. This app will ensure the comfort of buying medicines. This is where the idea of Green Medic comes from; Green Medic give the comfort and encouragement of buying medicines from home without any hassle.

1.5 Report Layout

This project report based on six layouts and we have discussed full project in these six layouts. Given below:

First Layout: We have covered in this layout- Introduction of the project, Motivation of this project, Objectives and expected outcomes.

Second Layout: We have covered in this layout- Background of the application, related works, comparative studies, scope of the problems, challenges.

Third Layout: We have covered in this layout- Business processing model, requirement collection & analysis, use case modeling, logical data model and description.

Fourth Layout: We have covered in this layout- Front end and Back end design, interaction and UX design, implementation requirements.

Fifth Layout: We have covered in this layout- Implementations of Database, Front-end design and interactions, testing implementation, results and reports.

Sixth Layout: We have covered in this layout- Conclusion, Discussion and scope for the future work.

CHAPTER 2

BACKGROUND

2.1 Introduction

In this chapter will discuss about the existing work which are providing online medicine delivery. This chapter also focus on the current challenges among the existing work and also what service they provide. And we discuss what type of problem exist on their service.

2.2 Related Works

From our research, we have found some of online medicine delivery services which is somehow related to our proposed work, but those services are not quite similar to Green Medic project. Some of the online medicine delivery providers we have found in our country and in neighboring country India

A. Lazz Pharma

Lazz pharma is one of the most popular medicine retailer shop in Bangladesh. Lazz Pharma has successfully leveraged its leadership position in pharmacy business in Bangladesh and its convenient store locations to capture a significant share of the market in front store merchandise, including over-the-counter medications, health and beauty aids, cosmetics and fragrances, seasonal products and everyday household essentials.[1]

Their Services:

- They provide retail medicine from their physical store and online.
- They provide a home delivery service all over the Bangladesh.
- They provide customer support for ordering online, through their website and mobile app.
- They provide Generic and Branded prescription and over-the-counter medicines.

B. pharmacy.com.bd

Pharmacy.com.bd working abroad and local residents who send medical allowance for their loved ones can now be assured that their hard-earned money is spent where it is intended for. Pharmacy.com.bd is among the leading online pharmacies, which specializes in providing generic and OTC products.[2] With its home delivery facility - Express Home Delivery, buying medicines and grocery items is just a phone call away and delivered right to the customer's doorsteps.

Their Services:

- They provide retail medicine only online.
- They provide a home delivery service all over the Bangladesh.
- They provide customer support for ordering online, through their website, mobile call and Facebook.
- They provide Generic and Branded prescription and over-the-counter medicines.

C. ousud.com

Ousud.com is a professional service company - with an independent pharmacy and direct links to pharmaceutical suppliers - providing delivery services to the public for medicine and other health care products.[3]

Their Services:

- they provide a delivery service across Dhaka City for health care products
- They provide customer support for ordering online, through Facebook, SMS, or email.
- They provide a service support hotline to ensure customer satisfaction.

D. Others: Netmeds, PharmEasy, Medwik, Practo & Yodawy

Netmeds [4,] Medwik [6] are the online healthcare and medicine service provider through web based application and Practo [7], PharmEasy [5], Yodayaw [8] are smartphone application.

2.3 Comparative studies

A brief comparison of functionalities of Green Medic application and other related applications available on the market is given below:

Table 1: Comparative Studies

Service:	Name:	Features:
Related	Lazz Pharma	Provide retail medicine from their physical store and online, home delivery service, OTC service.
Related	pharmacy.com.bd	Provide retail medicine only online, home delivery service, OTC service.
Related	ousud.com	Provide home delivery support, customer support.
Related	Netmeds, Medwik, Practo, PharmEasy, Yodayay	Netmeds, Medwik are the online healthcare and medicine service provider through web based application only. Practo, PharmEasy, Yodayay provide service through smartphone application.
Our Project	Green Medic	'nearby tracking system' feature for ordering medicines from immediate nearby pharmacy or manually search for one, simple user interface and very easy to use customer and pharmacy app, history option for keeping records of orders and deliveries, home delivery service, support functionality.

From the above-mentioned comparison table, we can see that our proposed project offers the nearby search option for finding pharmacies nearby the customer for ordering medicines. Other related services provide the medicines that are only available in their stock on the contrary our proposed service has made a decentralized approach to this matter which means customers can go through different pharmacy options for finding

and ordering their desired medicines using the application. They can cancel their order and place it in another pharmacy if the desired medicines are not found in on place.

2.4 Scope of the problem

There is no development project without scopes of problems. Ours is indifferent to this situation. Our developed system should be working properly to deliver the appropriate services to both the customers and pharmacies as we claimed. Our database should store and sort all the data correctly in real time. Both of the apps should work smoothly and properly. If any of the included features and options in our apps does not function correctly and fails to work efficiently in time then our project will fail to serve the objectives and provide expected outcome. So, to avoid any sort of issue we have to work carefully.

2.5 Challenges

The challenges we faced in our project given below:

2.5.1 Problem finding

We tried to analysis the application to get problems. Is this application actually working? Or are the customers facing any issues while placing orders? Is the pharmacy having problems receiving the orders? Are there any issue creating an account? Finally, we got positive outcome.

2.5.2 Simple and user-friendly User-Interface

As our special focus is to support the elders who cannot visit a pharmacy on emergency, we had to create this app with so simple user interface that they can easily understand how they can create account, place orders from their desired pharmacy nearby etc.

2.5.3 Time management

It is very necessary to maintain time. Is the application working properly in time? Is it taking too long to load? Is it taking too long to place orders? Is it taking much time creating an account? After running several tests our application is running timely.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Requirement Collection & Analysis

Requirement collection is one of the very important parts of building an application. It can decide how we serve the user by the application; particular problem needs particular requirement. So, our application requirement given bellow:

1. Small in size that does not require much memory space.
2. There is no complex login procedure.
3. Users can create account easily through OTP (One-Time Password) feature.
4. This application is totally free of cost.
5. Simple user interface with no complexity.
6. Pharmacies nearby are easily findable through this app with distance.

3.1.1 Hardware and software requirement for System

There are some requirements for this application:

1. Smart Phone
2. Android Jellybean version or above
3. 1gb Memory Ram
4. About 50 MB memory space

No special permission needed for this application.

3.1.2 Analysis

We have analyzed and studied a lot to create this application. We are confident that this project is suitable for users. We researched in various sites, analyzed few similar applications. Noticed what they do not have in their applications, and what we can add to make our app unique. We used applications to learn some concept to give better experience, gather knowledge to complete this project. We designed our project for Android OS because most of the smart phone users in Bangladesh use Android phone.

3.2 Use case

The diagram is given below:

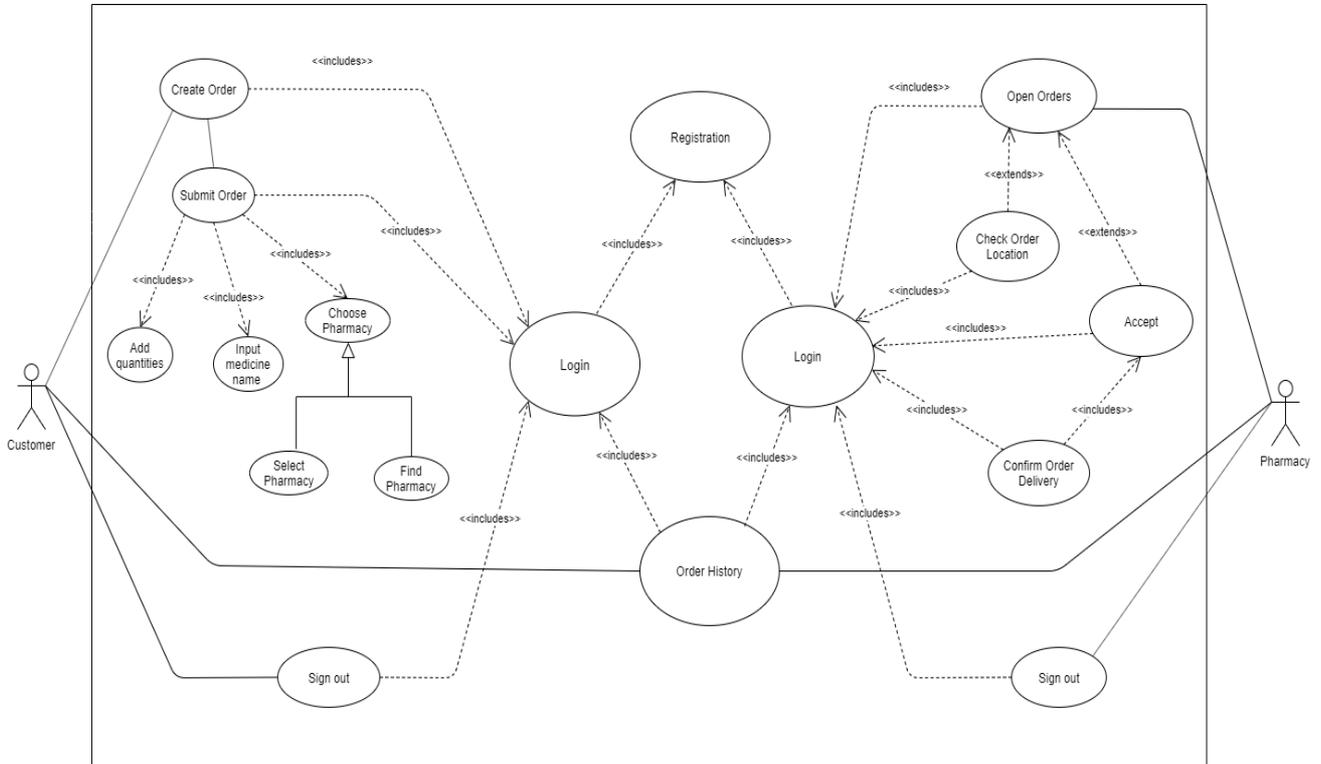


Figure 3.2.1: Use case of Customer and Pharmacy

3.3 Entity Relationship Diagram

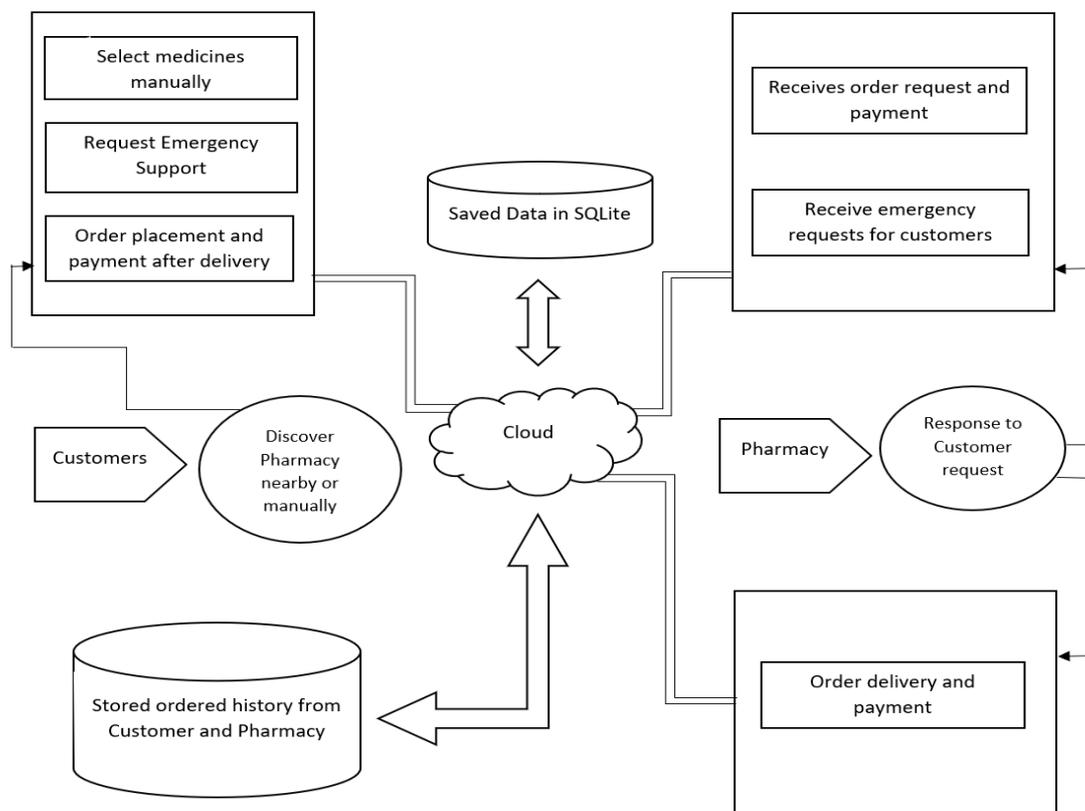


Figure 3.3.1: Entity Relationship Diagram.

When a customer places order by inputting the necessary medicines' names and quantities, this data is saved in the SQLite server which is an offline database used in our application. So, when the customer is offline, he or she will still be able to see and check all the orders that have been placed and recorded in the order history. When they are online then this saved data is sent to and synced with our real time firebase database. Then on the other hand when the user on the pharmacy side checks their received order from their app then the stored data in the firebase is shown in their application and the data is again saved in the SQLite database so that the pharmacy user can also check orders when they are offline. Then the payment is made on delivery of the medicines.

3.4 Flow Chart:

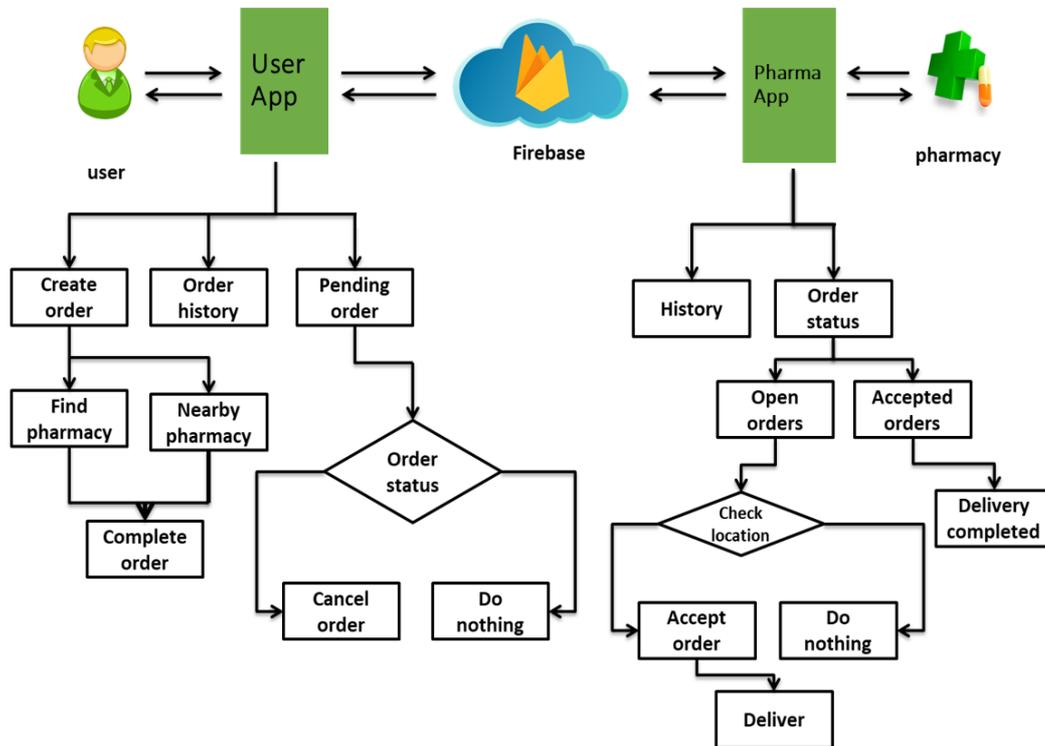


Figure 3.4.1: Flow Chart

On the user app a customer can create order, check order history and pending orders. After clicking “Create Order” the customer can search for a pharmacy manually or they can use the “Nearby Pharmacy” option to see all the available pharmacies nearby their location. After selecting a pharmacy, they can complete the order making process. They can also see their pending orders that have not yet been delivered. Then this order data is stored in the real time firebase database. Then this data is sent to the pharmacy app from where the pharmacy user can see the orders they received in the “Order History” section. They can also check the “Order Status” whether the orders are delivered or not. After opening and order they can check the location from where the order has been sent to them. After checking the location and distance of the customer the pharmacy user can either accept the order or cancel it. The payment will be made on delivery.

3.5 Activity Diagram

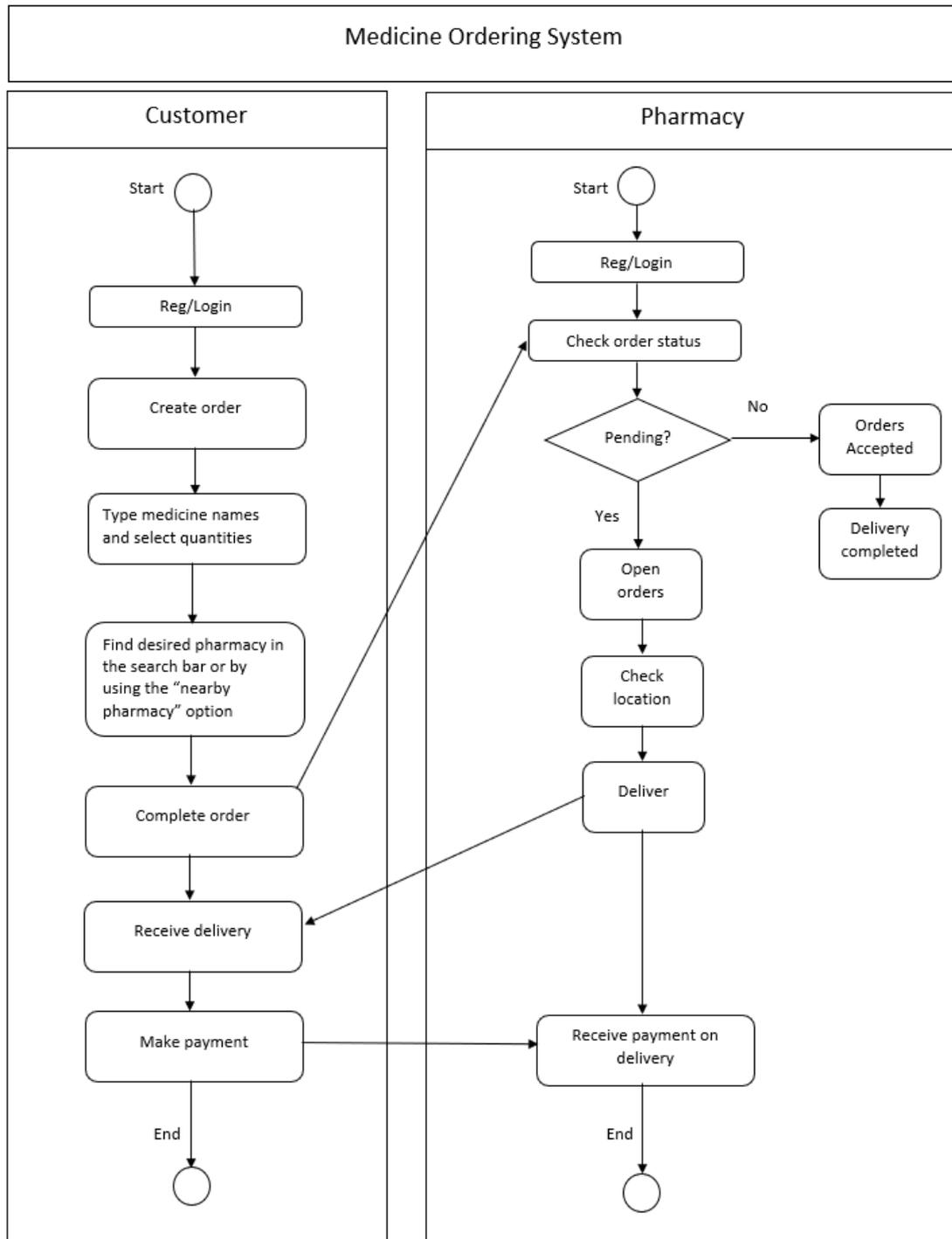


Figure 3.5.1: Activity Diagram

3.6 Design Requirements

1. Application Requirement: Specified that how the application will perform. And task is to make our application perform fast.
2. Efficiency requirements: This application should be running faster than the existing similar applications
3. Reliability requirements: Even any hazard occurs though the application should be able to operate or perform.
4. Usability requirements: The application should be so user friendly that users can easily interact with it.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-End Design

Front End Design is the display design in what user directly can interact. We tried to make simple user interface so that customer and pharmacy both can easily and comfortably can use this application and they don't have to face any difficulty. We used XML code for layout design.

Front End Design has been designed with constraint layout, Recyclerview, Card view and coordinator layout for looking more efficient used next button, Create Order button, Add Medicine button, Find Pharmacy and Select Pharmacy in the customer application. We also used medicine search field and quantity measure key for searching medicine and searching pharmacy for ordering. Google map also integrated in this application. In the pharmacy app there are two section like padding order and accepted order. There are two buttons for check order location and confirm order location. Both the app has navigation drawer. We used login and sign in option at the beginning of both the app. Sign up option also integrated.

4.2 Back-End Design

The Back-End Design has been done by Java Language. First to last we used raw java coding to make the Green medic Application. In Back-End we have used 13 activities for customer app and 11 activities for pharmacy app. There are more than 10 features in this application. In Back End we used firebase for authentication and as a realtime database. It will store delivery related information from the customer app and store it . The pharmacy user then can see that received order data retrieved from firebase into the pharmacy side of the application. We used google maps API in both of the app. This will help us getting location and distance between customer and pharmacy.

4.3 Interaction Design & UX

User interface defined the Front-End design of the application but the UX also known as User experience (UX) focuses on having a deep understanding of users, what they need, what they value, their abilities, and also their limitations. UX best practices promote improving the quality of the user's interaction with and perceptions of your product and any related services. So, it also an important part of our application.

Interaction is the media of a user and an application. How the user can easily interact with an application is very necessary thing. We have designed the application so that user can comfortably and easily can interact with that application. Hopefully our second edition will have easier and useful interaction design.

4.4 Implementation Requirements

To implement our project, we used different types of tools, components, and structures that helped us to develop our project successfully.

- For the front-end of the application we used XML, Material design.
- For back-end we use JAVA as an object-oriented language.
- For real-time Database we use Firebase.
- For location tracking we use Google Maps API.
- For visual aspect, fonts and icons are used from google font and font-awesome.
- We have written the codes in Android Studio.

Here we have described some of the important equipment that we used to develop our application,

4.4.1 XML for Layout design:

XML stands for Extensible Markup Language. It is a language that defines a set of guidelines for encoding files in a layout that is readable by means of both Machine and a Human. It is similar to Hypertext Markup Language (HTML). Both of them have markup symbols to describe the page or file contents. The integral building square of

an XML file is a component, characterized by using labels. A element has a start and a closure tag. All components in an XML document are contained in a peripheral component recognized as the root element.

4.4.2 Firebase:

Firebase is Back-end as a service owned by using Google which provides a server-less backend to the app developers. We can integrate Firebase in Android, IOS, websites and other applications. It offers all backend services like authentication by means of Google, Facebook, OTP, email, etc. Other services encompass Real-time database to save text details, storage to save multimedia, cloud provider to send notification and analytics to monitor app utilization and crashes.

4.4.3 Google Maps API:

The Google Maps API lets us request maps from Google and display them. The Maps API returns helpful data about places and locations.

It does two major things:

- It can cause maps to appear for the user.
- It can return data about a latitude/longitude location, or return data about an address.

CHAPTER 5

IMPLEMENTATION & TESTING

5.1 Implementation of Database

Our approached database consists of four tables named “Medicines”, “Order Requests”, “pharmacies” and “user”. Client and also the pharmacy’s signup and login credentials are kept in the “user” table and synchronized through App. To form a record of an order assigned with medicines we tend to use an instance of the “medicines” table within the “order request”. To avoid error, we used geolocation to position the client and the selected pharmacy and also showing the shortest distance between them through the google map API.[11] All those read and write operations of the database are handled by google Firebase.[9]

5.2 Implementation of front-end design

There are basically two apps of Green Medic – Green Medic for customers and Green Medic Pharma for pharmacy.

The implementation of the customer’s app’s front-end design is given below:

5.2.1 Create Account (Customer):

After opening the app, the customer will be introduced to this account creation page.

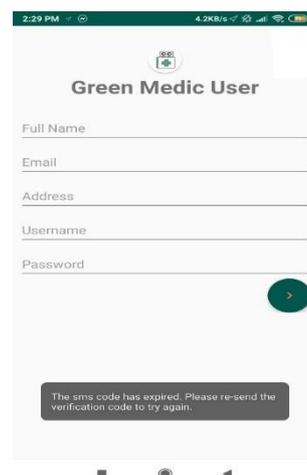


Figure 5.2.1.1: Create Account (Customer)

5.2.2 Login (Customer):

After creating an account, the customer will then be able to login to the app using their phone number from next time.

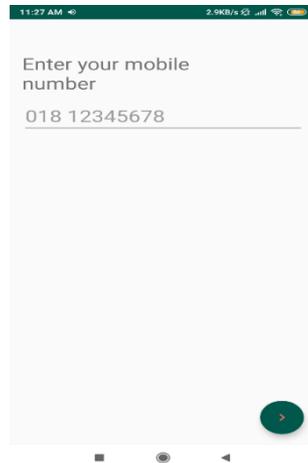


Figure 5.2.2.1: Login

5.2.3 One-Time Password (OTP):

The One-Time Password support enables the customer to create account using a six-digit code.[12] the code is then sent to their phone number which they have provided.

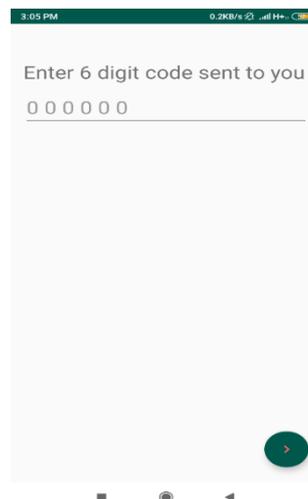


Figure 5.2.3.1: OTP

5.2.4 Navigation Bar:

When the user swipes to the right from the left edge of the app, they can access the navigation bar which displays the available options they can choose from to see.

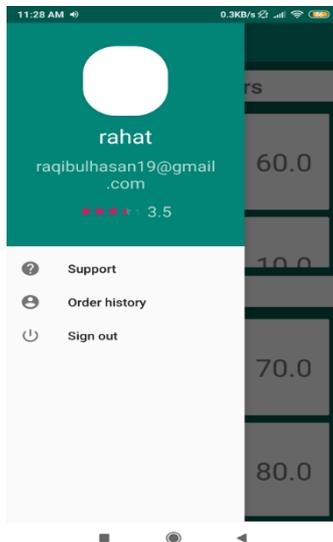


Figure 5.2.4.1: Navigation Bar

5.2.5 Order History:

Here the users can see the list of all the orders they have placed before using the app.



Figure 5.2.5.1: Order History

5.2.6 Pending Orders:

Here in this section the customers can see all the orders that have placed which are pending. When an order is delivered it get removed from the pending list.

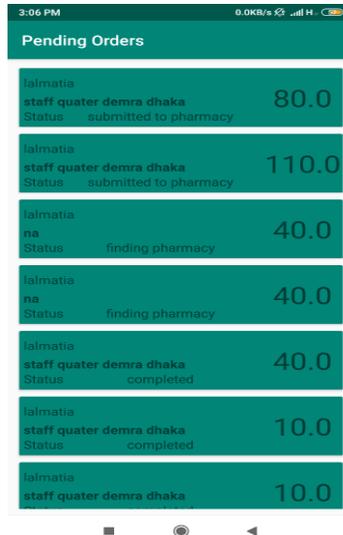


Figure 5.2.6.1: Pending Orders

5.2.7 Create Order:

When the customer opens the application, they are shown this create order section from where they can start making the order by clicking the “Create Order” button.



Figure 5.2.7.1: Create Order

5.2.8 Order Medicine:

Here the customers can place their orders by typing in the medicine name and putting the quantity according to their need.

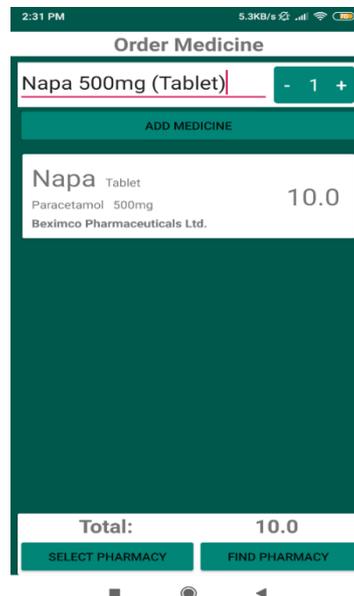


Figure 5.2.8.1: Order Medicine

5.2.9 Find Pharmacy:

From here the customers can search for their desired pharmacy from where they want the medicines.

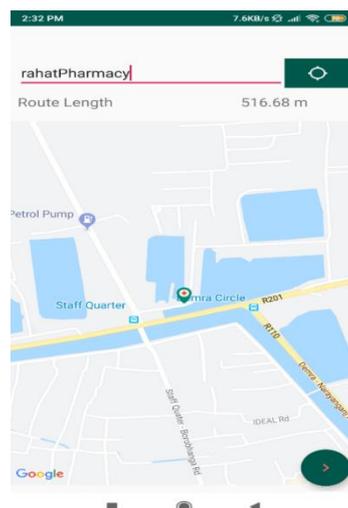


Figure 5.2.9.1: Find Pharmacy

The implementation of the pharmacy app's front-end design is given below:

5.2.10 Create Account (Pharmacy):

From here the Pharmacy user can create account to use this application.

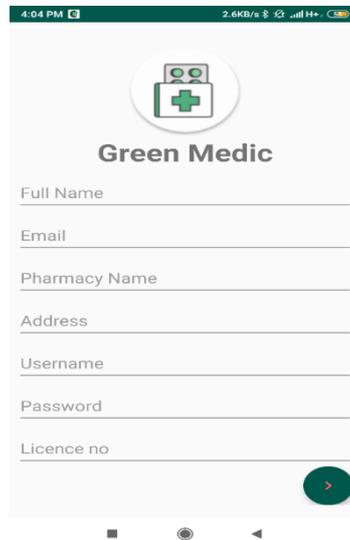


Figure 5.2.10.1: Create Account (Pharmacy)

5.2.11 Login (Pharmacy):

Like the customer the pharmacy user can also login with phone number from here.

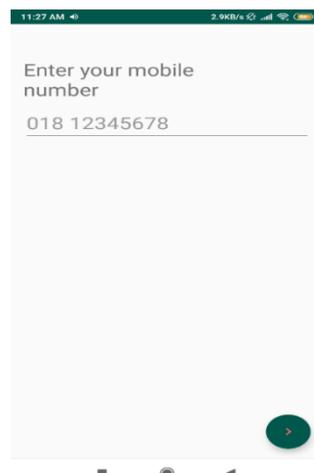


Figure 5.2.11.1: Login (Pharmacy)

5.2.12 List of accepted and pending orders:

This is the first page the pharmacy user is introduced with after logging in. The accepted order section shows the orders that have been accepted and the “Open Order” section shows the orders that are yet to be delivered.



Figure 5.2.12.1: List of Accepted and Pending Orders

5.2.13 An order checking list:

After clicking an order from the “Open Orders” list, this page is shown regarding the details of an order made by a customer.

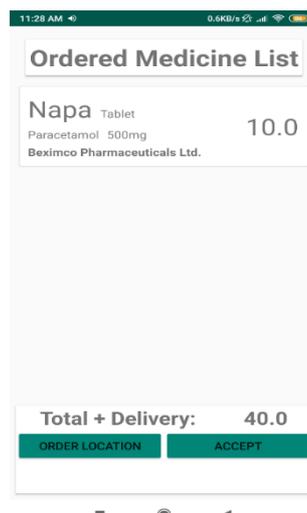


Figure 5.2.13.1: An Order Checking List

5.2.14 Order Location:

Clicking the “Order Location” option brings up this page which shows the order location of a customer and the distance is shown in the map.

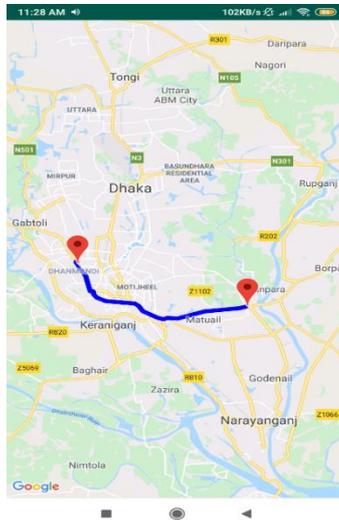


Figure 5.2.14.1: Order Location

5.2.15 Confirming Delivery:

From here the pharmacy user can click the “Order Delivered” button to confirm an order.

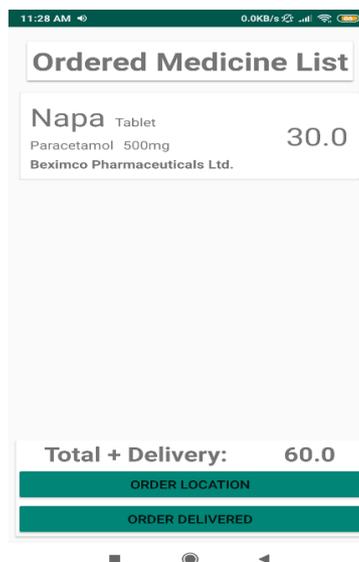


Figure 5.2.15.1: Confirming Delivery

5.3 Tests Results and Reports:

Table 2: Beta Testing of the customer application

User	Sign in	Log in	Create Order	Pending Order	Order History	Back Button	Add Medicine	Select Pharmacy	Find Pharmacy	Sign out
1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: Beta testing of the pharmacy application

User	Sign in	Login	Order History	Order Location	Order delivered	Pending order	Order accept	Sign out
1	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	Yes	Yes	Yes	Yes	Yes	Yes	No	No
5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	No	Yes	Yes	No	No	No
7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
10	Yes	Yes	Yes	Yes	Yes	Yes	No	No
11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

From the test results we found and mentioned above we can see in very few places some users faced issues while using some features in both the applications but fortunately majority of the users have successfully been able to use all the functionalities available which means both of our applications are serving their purpose as expected. We are hopeful that our future updates will remove the possible bugs currently in both the applications ensuring 100% satisfactory user experience.

CHAPTER 6

CONCLUSION & FUTURE SCOPE

6.1 Conclusion & Discussion

If we summarize the whole thing then this project is basically an android app and with this, getting the medicine you need is simple. Easy-to-use to conveniently order your medicines from anywhere. Just tap the app, add medicines, rest assured that your medicines will be delivered. Running out of your vital medicines can wreak havoc on your health. So, using the app can reduce the difficulty of buying medicines.

This is fully accessible and easier to use. User logs into the app, select the desired medicines, select one option between the two options (Find Pharmacy, Nearby Pharmacy) and send the request to the pharmacy. Pharmacy also just has to log into the app and accept requests according to the availability of the medicines.

6.2 Limitations

We could have made this project more efficient but as it is android based application, we need to fix the bugs and develop this project continuously. We have encountered a problem that this app will face some problems while working on those mobiles which have notch display. We didn't know how to optimize this app for notch display.

We also wanted to add online payment option which. It could increase more sales by reaching new customers. More efficient and effective transactions. Everything is made in just a few minutes and without wasting customer's time. All customers can pay for product or service at anytime and anywhere. But adding an online payment method is a long and difficult process. There are some security issues too. So that's why we could not implement this feature.

6.3 Scope for further future work

Since our proposed project has such a clean and such user-friendly interface, it can also be used for some other purposes. Earlier we planned to add some other features which unfortunately, we could not implement but we would like work on those features to provide more services along with medicine delivery.

This can be a great platform to sell unused medicines, because people at times buy so many medicines but few of them stay unused. So, in that case, if we add a feature on our app where people will give advertisement of unused medicines then it will be very helpful.

Besides, we want to work on some other features such as emergency doctor call, emergency ambulance call, on request pressure checking. This feature will be beneficial for the customers.

We will also add an image processing feature. We will add a feature so that people can capture photos of prescription or scan the prescription and send it to the pharmacies.

This app can also be an entrepreneurial project. Our initial plan is to create a bridge between the customer and user. We will work as a medium to deliver the products. In this way we can make this a business project.

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APPENDIX

APPENDIX A: Project Reflection

We have put a lot of effort doing this project. While developing this application we have learnt lots of things of which we did not have a proper knowledge before and we are still learning. We have used firebase as our real-time database and got to learn how it works, we learned how the google map and the API works for detecting location of users within the application. We have understood the importance of accuracy that is needed for this application to work successfully for giving better user experience. We are hopeful that the knowledge and experience we have gained while doing this project work will help us improve a lot in our future work resulting in better output.

APPENDIX B: Related Diagrams

The flow chart below shows the overall functionalities of the customer app and the pharmacy app. The user can create order, check order history and pending orders. Customers can also search pharmacy either by manual search or by using “Nearby Pharmacy” option for finding all the available pharmacies nearby through on the map. After completing order the data is stored in firebase from there the pharmacy user can see the orders on their application. They can also see order history and order status. After opening orders they can see the order location and then either they can accept the order or cancel it. They will receive payment on delivery.

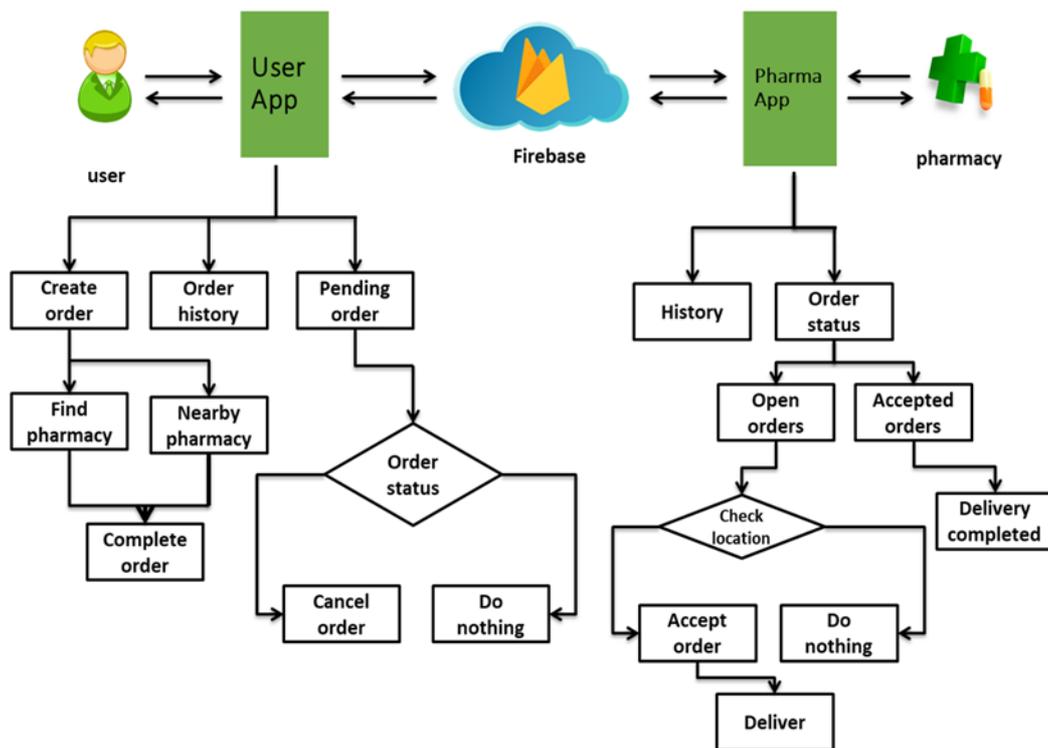


Figure: Flow Chart of Green Medic application

PLAGIARISM

