



# BANGLADESH UNIVERSITY of BUSINESS AND TECHNOLOGY

## ***Covid-19 Bangladesh – ANDROID MOBILE APPLICATION***

### Project Report

*Submitted to the Department of Computer Science and Engineering Bangladesh University  
Of Business And Technology (BUBT), Dhaka In partial fulfillment of the requirements for the  
degree of*

**BACHELOR OF SCIENCE**

**IN**

**COMPUTER SCIENCE AND ENGINEERING  
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# Certificate

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## Declaration

This research is dedicated to our friends and well-wishers. They are our inspiration. We admirably dedicate this work to our beloved parents who had motivated us all the time also their support, hope, and confidence to us make sure that we can give our best to finish what we intend to do. We are declaring that this is the only and new project (Covid-19 Bangladesh) which we are going to submit.

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## **Abstract**

The current situation is this, peoples have a panic about the Covid-19 pandemic. After caught a fever or got a cold, they easily assumed that they are affected by covid. In Bangladesh, many peoples are not concern about the covid pandemic nowadays. So, pandemics affecting people increasing day by day. After infecting by Covid-19, they got panicked and don't know which hospital is specialized in Covid. It is possible to save many lives if they get proper treatment in time. During this pandemic situation, it's not easy to find a hospital that is specialized in Covid. Our application will help covid affected people by finding them nearest covid hospital and creates self-awareness about this pandemic by tracing the world as well as all cities of the country. This app will provide the health information of Covid-19.

Keywords – Covid-19, Covid-19 tracker, Covid-19 Bangladesh health care, Covid-19 Bangladesh

# Content

Certificate .....	I
Declaration.....	II
Approval .....	III
Acknowledgments.....	IV
Abstract .....	V



# List of Chapters

## Chapter 1: Introduction

1.1 Introduction .....	9
1.2 Problem Statement .....	9
1.3 Problem Background .....	9
1.4 Project Objectives .....	10
1.5 Motivation .....	10
1.6 Flow of the project .....	11
1.7 Significance of the project .....	12
1.8 Proposed System .....	12
1.9 Summary .....	12

## Chapter 2: Software Requirements Specification Document

2.1 Data Requirements .....	13
2.2 Functional Requirements .....	13
2.3 Performance Requirements .....	13
2.4 System Requirements .....	14
2.5 Testing and Maintainability Requirements .....	14

## Chapter 3: System Design

3.1 Design Approach .....	15
3.2 Detailed Design .....	15
3.3 Application Design .....	16
3.4 User Interface Design .....	17
3.5 Methodology .....	18

## Chapter 4: Implementation and Testing

4.1 Introduction to Programming Languages .....	19
4.2 IDE's, Tools, and Technologies .....	20
4.3 Security and Permission in Android .....	22
4.4 Test Plan and Test Activities .....	22

## **Chapter 5: Results and Discussions**

5.1 User Interface Representation .....	24
5.2 Description of Features and The Approach .....	25

## **Chapter 6: Ethics, Challenges, Timeline and Gantt Chart**

6.1 Ethics .....	29
6.2 Challenges .....	29
6.3 Timeline and Gantt Chart .....	30

## **Chapter 7: Conclusion, Future works and Limitations**

7.1 Conclusion .....	31
7.2 Future Works and Limitations .....	31

# **Chapter 1: Introduction**

## **1.1 Introduction**

In Bangladesh, peoples are not concern about the covid pandemic nowadays. So, pandemics affecting people increasing day by day, after affecting pandemics they can't find covid isolation or covid hospital easily. The current situation is this, peoples have a panic about this pandemic. No application is built yet in Bangladesh for Covid-19. In this application people can find the global information of Covid-19 also get information about a specific country. People can know covid affected cases all the cities of the country. They can find the nearest hospital from the location and can know the hospital details. They can also know which zone they belong to according to affected cities. Here some health tips are also provided.

## **1.2 Problem Statement**

Covid-19 turned into an alarming situation in a different state. With a huge number of infection rates, it was really hard to record data about a large amount of hospital information, based on a different division. Government and Non-Government health organizations have taken the initiative to give service to the Republic People of Bangladesh. In this project all kinds of information were collected from various Govt. and Private sector websites. Following this information data has been included.

## **1.3 Problem Background**

Contact tracing, Corona tracer Bd and different kinds of applications were developed at the beginning of the Covid-19. Many individual websites are giving hospital information. Some websites give the information of Covid -19 death, affected case, recovery case individually. In this project, we solve this problem and we help the user to find the nearest hospital, etc. We also help people to find the risk of their area for Covid-19.

## **1.4 Project Objectives**

This project is to create a complete and working interactive app-based system.

The objectives of our project work are as follows:

1. Finding all division hospital's information.
2. Searching any individuals hospital by using Google Maps.
3. Getting nearest hospital
4. Knowing information about global states including all countries.
5. Finding the risk zone of Bangladesh
6. Getting ideas about affects people in all cities of Bangladesh.
7. Learning symptoms and things to do for awareness themselves.

## 1.5 Motivation

This disease has both short- and long-term impacts on communities, health systems, and individuals. The uncertainties surrounding the nature of this global pandemic, social restrictions, preventive measures, and lockdown have caused physical and mental problems for individuals.

## 1.6 Flow of the Project

The project work is growing into various steps. Firstly, we had to find the problem. Then, we designed a system that can solve this issue. Figure 1.1 showing the overall procedure of the system.

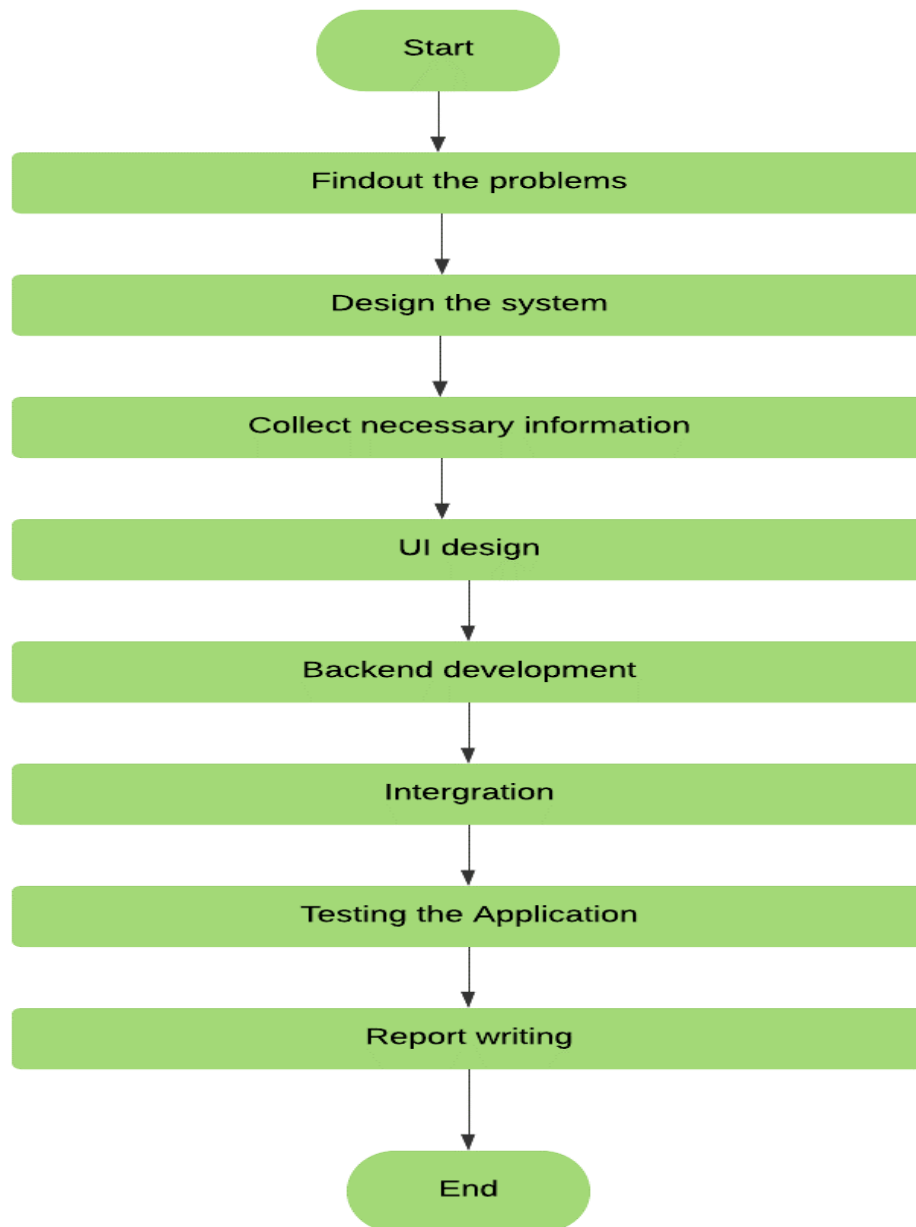


Figure 1.1 showing the overall steps to the project procedure

## 1.7 Significance of the project

Mobile Applications help the users perform single or multiple tasks. We built an application that will help society in this pandemic. Now, Covid-19 impacting the whole world's health system, the economical sector, etc. Creating self-awareness, getting treatment easily and health tips, knowing the zone dangerousness, the application will play a vital role.

## 1.8 Propose System

The Proposed System is an Android Application, “Covid-19” which tries to reduce pandemic problems. Why do we need a Mobile Application? A Mobile Application is a set of software that is designed and developed in such a way that it can run on any mobile device, smartphone, or tablet. Covid-19 is an Android mobile application that runs on an Android platform with Internet support. In this project, the Covid-19 Android application helps people avoid having to stand in a long queue by: 1. Finding all division hospital's information. 2. Searching any individuals hospital by using Google Maps. 3. Getting nearest hospital 4. Knowing information about global states including all countries. 5. Finding the risk zone of Bangladesh 6. Getting ideas about affects people in all cities of Bangladesh. 7. Learning symptoms and things to do for awareness themselves.

## 1.9 Summary

This chapter includes an overview of the problem that we have focused on the objectives of our project work, the background. This chapter also shows all the steps in which we have done our project work.

# Chapter 2: Software Requirements Specification Document

## 2.1 Data Requirements

The set of data that is connected in any project is defined using data requirements. For this project, the main data required is the Hospital information, Covid statistics. Without this, the application cannot give acceptable output.

## 2.2 Functional Requirements

Functional requirements are belongings that must be in the final system. For any mobile application, we need to download the application from the play store. The application is free as it is made for the Covid-19 pandemic. To use the application, the user needs to download it from the play store and need to install it on an android smartphone or tablet then they can use all the features of this application.

## 2.3 Performance Requirements

Response time, scalability, platform dependencies, tolerance are the performance requirements that need to be considered when developing any system. The application or the system should be able to respond quickly when the user acts reciprocally with the application. The application should be developed in such how that it should be scalable enough to accept new features once we'd wish to expand the application complexity. The application should run altogether the specified software and hardware requirements from the design phase of the project. Also, the tolerance rate (fault tolerance) of the appliance should be at a higher level in case of network issues, connectivity issues, and when the appliance crashes or stops. It should be able to deliver the knowledge about any of those issues to the user when the system is not anymore able to provide results when the user wants.

## 2.4 System Requirements

The application must be installed into an android device, system, or any machine in such a way that it must have basic requirements like supporting software and hardware of the device, accessing in-built software, say camera for mobile device, internet permissions, access GPS location and potential security issues such as a virus or any malware detection.

## 2.5 Testing and Maintainability Requirements

The application must be able to meet all the possible good and bad test cases under a test environment.

The application must be developed in such a way that it does not crash when the user is using the application. It must be able to extend itself when the developer expands the code or develop any new functions to the existing application.

## **Chapter 3: SYSTEM DESIGN**

### 3.1. Design Approach

This application is based on the functional design approach, which helps in understanding the design of the application more thoroughly by explaining its use cases, and implementation more. All the parts are designed, implemented, and integrated to make a flawless working application.



## 3.2 Detailed Design

The detailed design including features of the application is as follows:

### **1.Hospital:**

If the user wants to use the Covid-19 Bangladesh, they need to download the application from the play store and install it. This feature helps people to ascertain all the knowledge to seek out all divisions of the hospital of all departments including ICU, Isolation beds, hospitals type (Government and Private), and get in touch with contact numbers. Later, they will find their nearest hospital by using Google maps.

### **2.Trace world:**

In this feature, users can find a total statistical graph that shows the total of the infected, recovered, death, and also the active cases. Besides, those statistical numbers are also included. In the all country section the information is split and counted, based on the individual country information. Users can also search a specific country by searching the name of that country. When a user selects a specific country the total number of cases, everyday cases, the number of deaths.

### **3.Trace Bangladesh:**

This feature helps people to find the total cases in all the cities of Bangladesh. Once they click on the feature they can see the details of the city. Later, they can see the zone that is red, green, or yellow zone. They can know the zone's dangerousness they are living in.

### **4 Health and tips:**

This feature helps people is made in an easy step to know about symptoms and to do for awareness themselves. The user just checks symptoms to ensure their health condition and make sure that they are not infected. Also, they can get ideas of what to do for those who are already infected by this virus.

### 3.3 Application Design

The main goal of the system design is to explain the scenario using use case diagrams. Use case diagrams to clarify the flow of the application by deriving the use cases for all the functionalities in form of diagrams for the users.

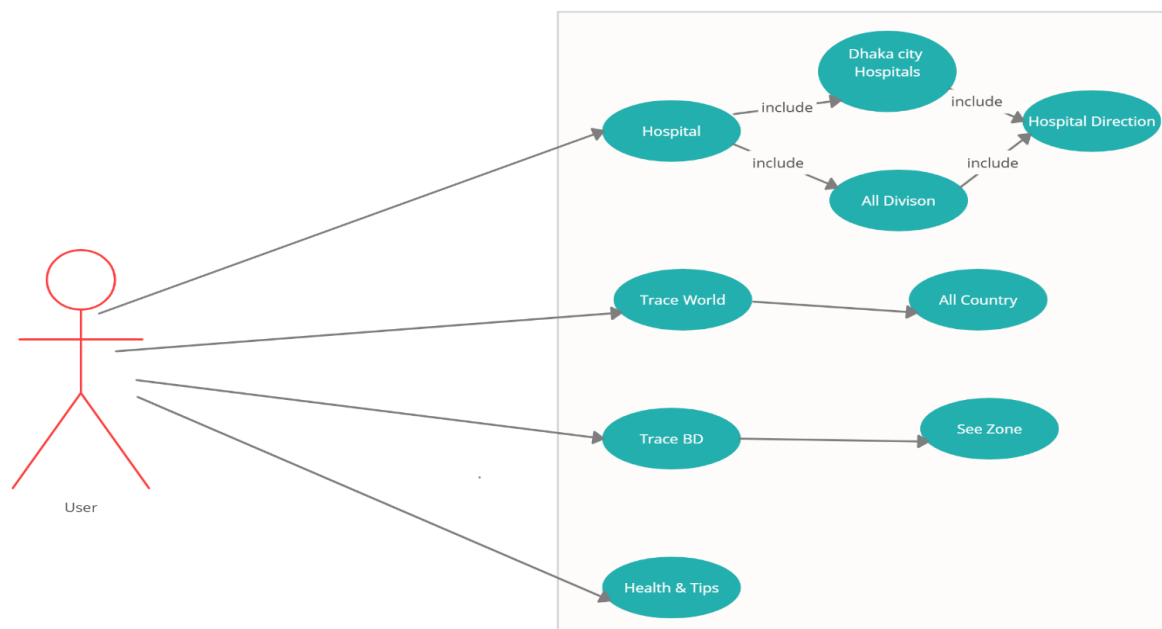


Figure 2: Use Case Diagram for User

### 3.4 User Interface Design

A simple attractive user interface design improves the quality user experience. We selected an easy layout and navigation so that users can easily use this application. After opening the app there will show a splash screen. In the main page, there is four option. Users can choose any of them with one click and every option is simply separated from others. Four different sections represent different information. But users have to move to the main page to go and choose another option.

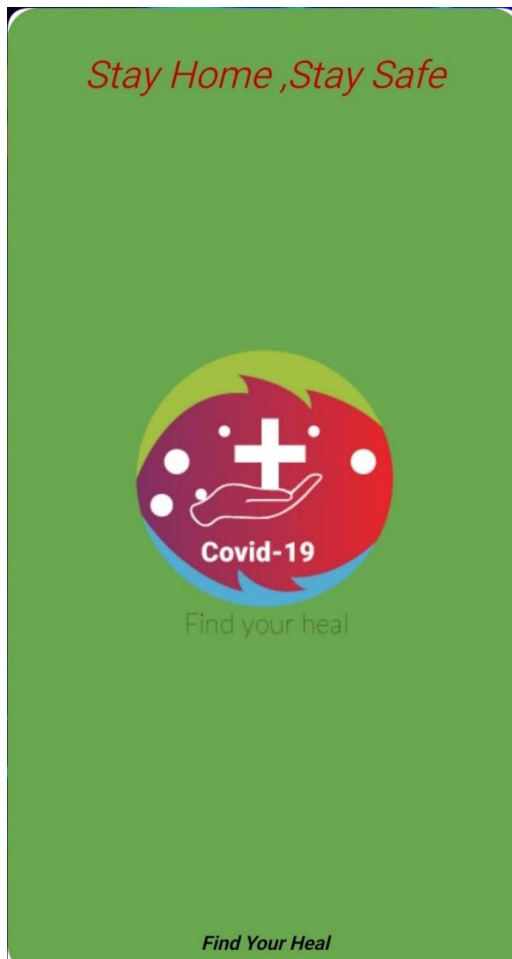


Figure 3: Splash Screen

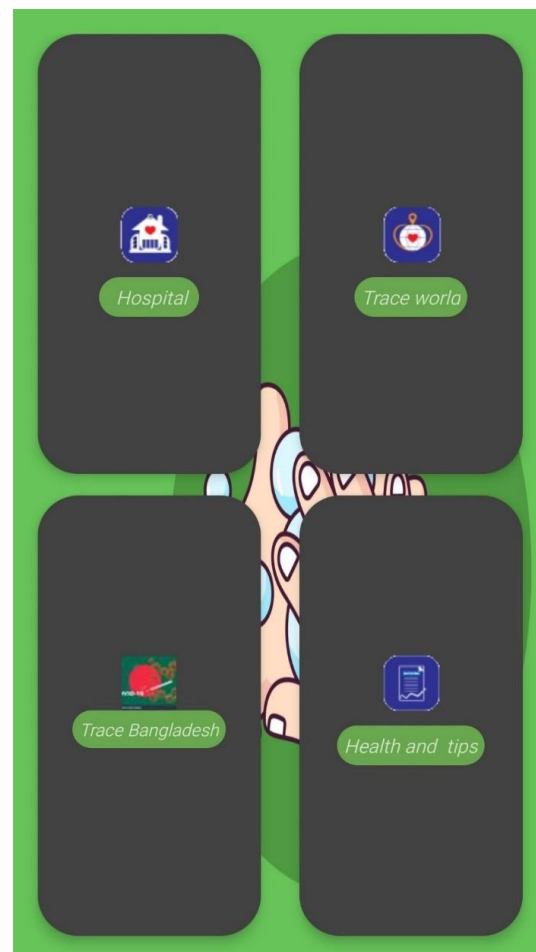


Figure 4: Home Screen

### 3.5 Methodology

I have unbiased this project using agile methodology by applying the principles of its. To illustrate, for example: In one of the modules," Scan an Item", before start developing it, I have even analyzed the design requirements initially and planned to execute them within the sort of short repetitions which are called undefined attempted to execute the planned tasks of the iterations accordingly but I could not finish kind of the tasks thereon particular iteration which they're carried to subsequent sprint and are called. undefined As mentioned, even during the development of the project I made a lot of changes

which is the biggest advantage of this system. So, for these reasons, I decided to follow the principles of agile methodology.

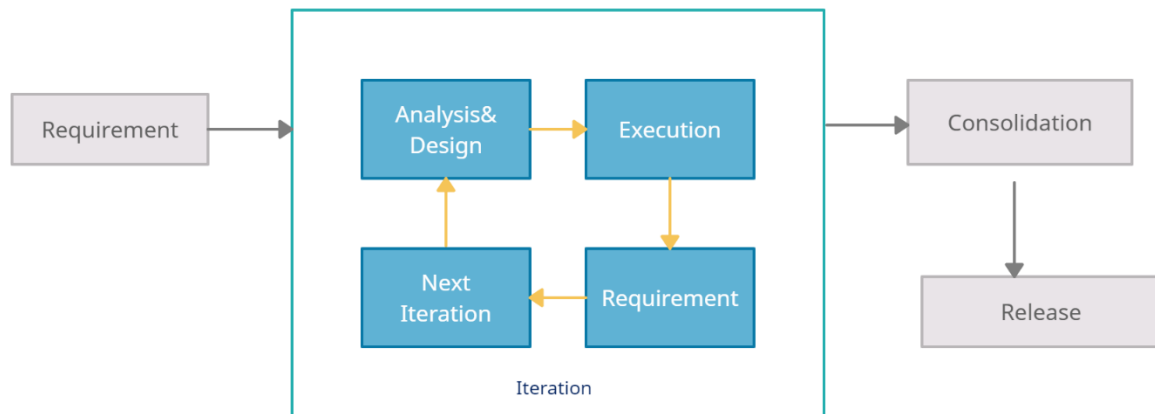


Figure 5: Agile Methodology

## Chapter 4: IMPLEMENTATION & TESTING

### 4.1 Introduction to Programming Languages

The project is developing an Android Application, the default programming language is Java. All Android applications are built by Java in Android Studio or Eclipse or both. Java is that the popular and widely used language around the world. Java is one of the foremost powerful programming languages like C, C++, developed by Sun Microsystems has many powerful features as described below. After the event of C, C++, Java has inherited evolution by addressing its drawbacks. It's one of the open-source projects which may be easily installed on our machine. The language is additionally easy to hunt out, understand

and implement. Java is employed in various sorts of applications like Web, Desktop, Mobile, and massive Data. Many powerful features are supported by Java including various libraries, application services, graphics libraries for 2D/3D applications. The language is flexible enough for code complexity, testing, maintenance Implementation, integration, and support. Additionally, others features make Java even more special. it's an object-based programming language hierarchy that's important in programming languages used for real-time implementation applications, it provides for code reusability, it is a platform independence feature including any virtual machines(Write Once Read Everywhere), As there is no need to write the code for the varied OS as Java Compiler converts the Java source files as bytecode for various OS. it's often explained by any machine and thus the first code is compiled. it's safer because the compilers are efficiently designed to figure out any quiet errors.

## 4.2 IDE's, Tools, and Technologies

### 4.2.1 Android Studio

Android Studio is a developing tool for Android applications. Which consists of all SDK tools for android designing, developing, maintaining, testing, debugging. This IDE has higher efficiency for development and is good for professional developers. It also supports IntelliJ, this IDE has some advantageous features to automatically detect the variables, class, methods, built-in functions. We can find suggestions if we have any first keyword of it. For example, we have declared some variables, that start with a variable 'V', it automatically detects every word which starts with 'V' and gives a suggestion. It supports Git as a version control system where we can push project files easily in Github. All files are integrated into a single code. When the project is completed, the project is automatically compressed in.APK (Android Package), this package can be installed and run on any compatible Android device.

#### 4.2.2 Android Software Development Kit (SDK):

One of the prime tools used in developing android applications, as it packages has many core features into one SDK and it can be used in the application easily. This helps developers to avoid writing a lot of code and developing applications faster.

#### 4.2.3 Android Debug Bridge (ADB):

Android SDK uses the ADB tool as a connector which allows connecting the Android Devices or Emulator with the machine via USB. After completing or the time of developing the applications, we can connect with the device to check how the application runs. Later, we can debug and run the applications.

#### 4.2.4 Gradle Build:

Gradle Scripts are the latest feature that is added to Android Studio. It's one automatic build system that is used automatically at different stages involved in designing an application that includes design, development, testing, debugging, and publishing. We configure projects and modules specifying all supported jar files, SDK's, version name, level, compiled SDK version, build tools version.to confirm that the advanced app is compatible with test devices/emulators. Gradle is also like Ant and Maven which helps in maintaining java projects (repositories).

#### 4.2.5 Android Device Monitor:

If developers want to access all the hidden files that are created when running the application, we can use the monitor. Programmers can select any project and explore the files that are relevant to that project. But, as they are hidden files, need root permissions to access them. Suppose, if we run the app in the device, we need to root the device and run commands in the adb shell to get permissions.

#### 4.2.6 SDK Manager:

It is one of the main tools to keep maintain the updates of all the installed components required to run the project. It also informs us when the project is not suitable with the device or any other Suitability issues and to download any essential component.

#### 4.2.7 AVD Manager:

It is used to create any desired virtual device of any API level to support higher-level SDK's in case our device does not support it. Using emulators to test the application is difficult as it might be a little slower when compared to the real device.

### 4.3 Security and Permissions in Android

There are a lot of security concepts on Android. Whenever a new Android app is made, a unique user and group ID. It maintains the application in an easy way to avoid any security or privacy issues. The application was created uniquely, it becomes private and no one can access other people's applications. Permissions is another important concept that is included in the AndroidManifest.XML configuration file. This is necessary if the application wants to access external features. Forex, If the application wants access to the Internet, Camera or it could be any feature, it needs permission. It is included in the tags because it is an XML file. Authorized permissions for applications were created automatically when we created the application. If the app uses has higher-level API or SDK we must mention Permission within the use-permission tag for access to features or elements.

### 4.4 Test Plan and Test Activities

The test plan is essential for any kind of project. We can not go for finalizing a project without the testing phase. The test plan includes design specifications of the project, execution of tests with different

manual and automatic tested tools. A test case is a method where the test result is documented, a specific design plan, and how the application works are stated here in a written document.

Test Activities in this project contain different testing like:

- Black Box testing: Here, initial sample test cases are written, manual testing is also done to check the application functionality works properly.
- White Box testing: When the application finds the user requirements and functional according to test cases, there is no logical error found in this testing phase.
- Unit Testing: All users, modules are tested by running the application.
- Integration testing: After testing all modules individually, submodules and modules are tested then into a single application.
- System Testing: In this part, all compatibility of applications is checked if it fulfills system software requirements.
- End to End Testing: At this stage, applications are tested connecting with other local networks, databases, machines, and installing Apk.
- Usability Testing: This is the final stage of the testing phase. Here application flow, the UI design flexibility of the application are checked.



## **Chapter 5: RESULTS AND DISCUSSIONS:**

### **5.1 User Interface Representation**

To make the application interactive, different regulations have been used and designed using the layout file. Following are the essential controls that are designed and used in this application:

- Text View: The text view feature belongs to the view group as a part of GUI. A TextView is a fulfilled text editor and it displays text or content view to the user and optionally allows them to edit it.
- Edit Text: This allows itself to be editable in the text box And EditText is a standard entry widget in android apps.
- Button: One of the important components that the application needs. It is mainly connected with action when the user clicks it. We can illustrate the button using any text which holds the action class on it.
- Image Button: Displays a button with an image that can be clicked by the user. Suppose, if we have an image for the button which we have designed, we can include that image using this control by adding the source or path of the image file among the tags in the layout file.

- List View: This is a key component that helps to display any information when we clicked the action button. It also allows to scroll through the screen and displayed information. Using a list adapter, the index is pulled from the database.
- Pie chart: This is used to represent value or data. It shows the percentage of a whole and represents the set point percentage also. It appears as a circular statistical graph and different numerical portions are divided into slices of that circle.
- Scroll view: This is a view group that enables a vertically scrollable view. It is used when a layout is long. It contains a single direct child.
- Card view: Card view is one kind of widget that's can be defined as a frame layout with rounded corners and shadow based on elevation.

## 5.2 Description of Features and the Approach

### **Hospital:**

If the user wants to use the Covid-19 Bangladesh, they need to download the application from the play store and install it. This feature helps people to ascertain all the knowledge to seek out all divisions of the hospital of all departments including ICU, Isolation beds, hospitals type (Government and Private), and get in touch with contact numbers. Later, they will find their nearest hospital by using Google maps(Figure 6). There is information on all of the hospitals in Dhaka city and all around Bangladesh(Figure 7)

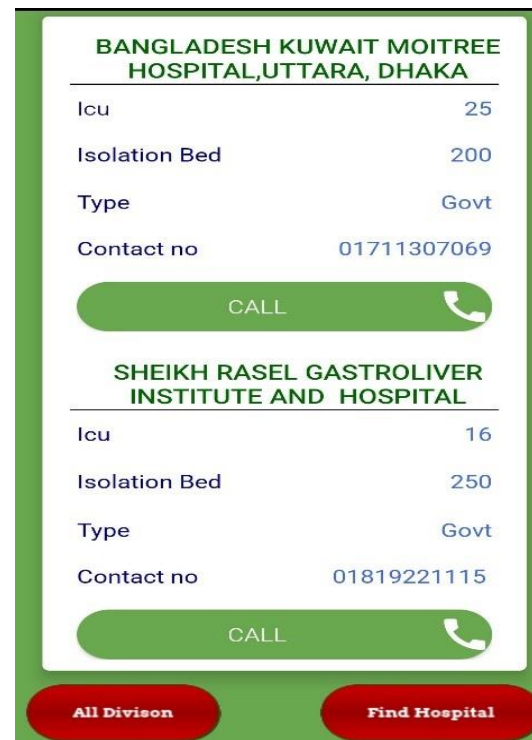
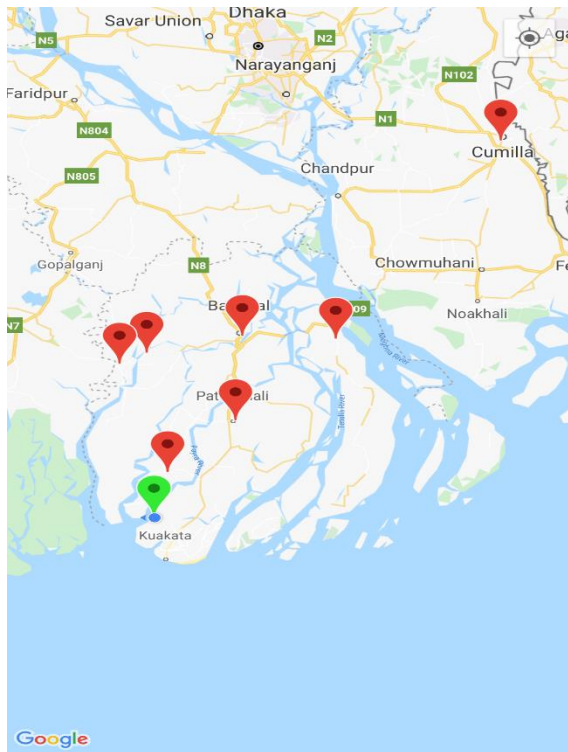


Figure 6: Showing Nearest Hospital

Figure 7: Hospital Information

**Green marker: User Location**

**Red marker: Hospital Location**

### Trace world:

In this feature, users can find a total statistical graph that shows the total of the infected, recovered, death, and also the active cases of the world(Figure 8). Besides, those statistical numbers are also included. In the all country section the information is split and counted, based on the individual country information. Users can also search a specific country by searching the name of that country. When a user selects a specific country the total number of cases, everyday cases, the number of deaths (Figure 9).



Figure 8: Global Statistics



Figure 9: Country Details

### Trace Bangladesh:

This feature helps people to find the total cases in all the cities of Bangladesh. Once they click on the feature they can see the details of the city. Later, they can see the zone that is red, green, or yellow zone. They can know the zone's dangerousness they are living in.

Red zone: More infected area (Most dangerous zone)

Green zone: Medium infected area (More dangerous zone)

Yellow zone: Low infected area (Low dangerous zone)

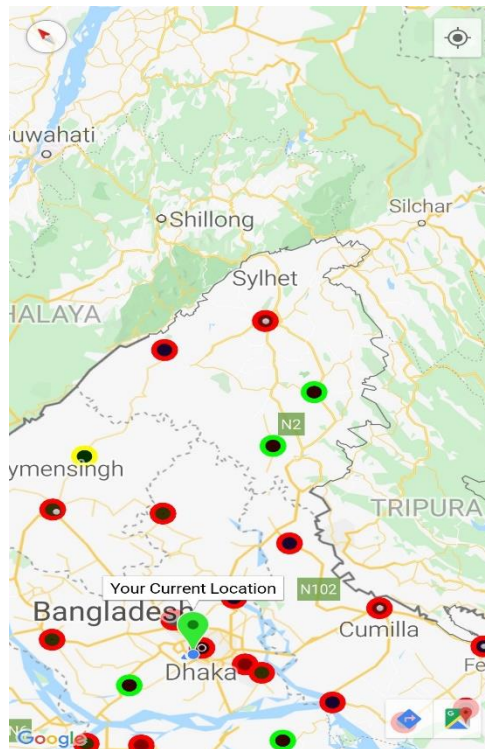


Figure 10:Check Zone dangerousness

### Health and tips:

This feature helps people is made in an easy step to know about symptoms and to do for awareness themselves. The user just checks symptoms to ensure their health condition and make sure that they are not infected. Also, they can get ideas of what to do for those who are already infected by this virus.

করোনার উপসর্গ ও করণীয়	
1	সন্দেহভাজন করোনা রোগীর ক্ষেত্রে
2	মৃদু উপসর্গের ক্ষেত্রে
3	মাঝারি উপসর্গের ক্ষেত্রে
4	তীব্র উপসর্গের ক্ষেত্রে
5	পোস্ট কভিড উপসর্গের ক্ষেত্রে
6	করোনার নতুন লক্ষণ সমূহ

Figure 11: Heath & Tips

উপসর্গ
<p>***পূর্বের(মৃদু উপসর্গ) উপসর্গের সাথে***</p> <ol style="list-style-type: none"> <li>১.জ্বর (১০১-১০২ ডিগ্রি)</li> <li>২.শরীরে শিরশিরে ভাব (নিয়মিত কাঁপুনিসহ)</li> <li>৩.ভারি কাশি</li> <li>৪.শ্বাসকষ্ট (অক্সিজেন সেচুরেশন ৯৪% এর নীচে</li> <li>৫.ক্লান্তি া</li> <li>৬.শরীরে ব্যথা</li> <li>৭.পেশীতে ব্যথা</li> </ol>
করণীয়
<p>=&gt; রোগীকে প্রচুর পরিমাণে প্রোটিন ও ভিটামিন-সি যুক্ত ফল যেমনঃ লেবু, কমলা, মাল্টা, আমলকি প্রভৃতি খেতে হবে।</p> <p>=&gt; একটি থার্মোমিটার দিয়ে শরীরের তাপমাত্রা পর্যবেক্ষণে রাখতে হবে।</p> <p>=&gt; পালস অক্সিমিটার দিয়ে অক্সিজেন স্যাচুরেশন পর্যবেক্ষণে রাখতে হবে।</p> <p>** উপুর হয়ে শোয়া, নিদেন পক্ষে উপুর হতে না পারলে পাশ ফিরে শোয়া।</p> <p>** ত্রিদিং এক্সারসাইজ করা।</p> <p>** দিনে ২-৪ বার নিঃশ্বাসে গরম পানির ভাপ নেয়া।</p> <p>** দিনে অন্তত ২/৩ কাপ গরম মসলা চা খাওয়া।</p>

Figure 12: Symptom & Tips

## Chapter Six: Ethics, Challenges, Timeline and Gantt Chart

### 6.1 Ethics

1. Privacy of data: All collected data are being kept private by developers and only be used in this project's future work if necessary.
2. Design: We focused on making an easy user interface so that users can find less complexity. For that design was maintained as simple as it can be.

3. Permission: Location access are integrated with google map API so the location of the user will work alongside google and privacy of that will be kept as google map policy.
4. Network access: User connection internet with malicious source can create data bridge. This application developer will not be responsible for unauthorized network source occurrence.

## 6.2 Challenges

- For collecting proper data we have searched for many sources. Finding authentic sources was also complex for us.
- In this application map old Gradle build version was used for that we can not able connect with the firebase database.
- In this application simpleArcLoader old Gradle build version was used for that we can not able connect with the firebase database.
- We don't have Google map place paid API that's why we couldn't use it for the searching nearest hospital . We did it manually.
- Finding the exact hospital location we manually searched and inputted the hospital axis in the map.

## 6.3 Timeline and Gantt Chart

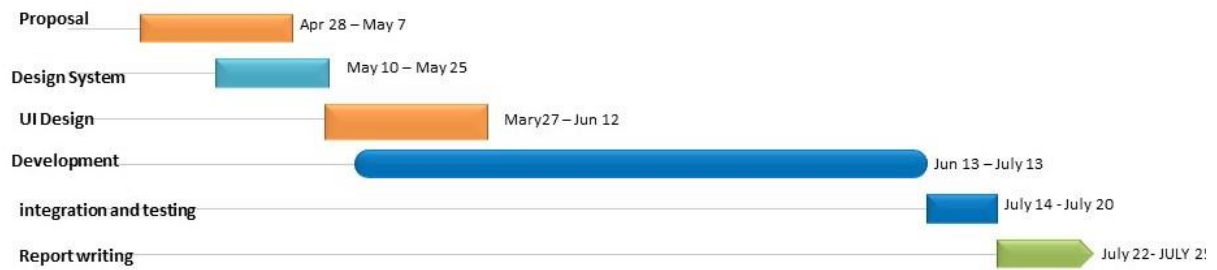


Figure 12:Timeline and Gantt Chart

## Chapter Seven: Conclusion,Future works and limitations



## 7.1 Conclusion

I have learned a lot from this project on how to develop Android Application and publishing it in real-time, use Web Services using SOAP UI, reporting using chart libraries, other libraries for scanning, payment, SDKs, requirement gathering, barcode, QR, RFID formats.

As mentioned, other existing applications do not help to reduce pandemics. In this application, people can know the information of hospital, can know global Covid-19 statistics as well as all the country of the world. Bangladeshi people can know all cities affected case and check their zone dangerousness. Health and tops also provide here.

## 7.2 Future works & Limitations

1. We will develop the application for maintaining social distance.
2. We will build an API to fetch data.
3. We will add a feature by implementing AI as people can detect Covid-19 possibility.
4. Contact tracking will be added here.

As the application is a native android app so this application will not install without any android platform. We will develop it both for android and ios by using flutter or react native.