

# COVI: A Covid-19 Tracker Application

Mariam Murad Suleiman<sup>1</sup>, Nasir Ahmed Algeelani<sup>2</sup>, Yazeed AlSayed Ali Al Moayed<sup>3</sup>,  
Nohaidda Binti Sariff<sup>4</sup>, Othman A.M. Miaikil<sup>5</sup>

<sup>1,2,5</sup>Faculty of computer science and Information technology

AL-Madinah International University

Kuala Lumpur, Malaysia

<sup>4</sup>School of Engineering, Faculty of Innovation and Technology, Taylors University, Selangor, Malaysia.

DOI: <https://doi.org/10.5281/zenodo.6779046>

Published Date: 29-June-2022

---

**Abstract:** The following research will focus on building a COVID-19 tracker app called COVI, with the main objective of keeping the people updated and educated on the Covid-19 virus. The user is required to provide different kinds of inputs in order for the app to be able to provide the user with many useful outputs, which can help the user in case of a Covid-19 Infection. This paper aims to implemented an android based Covid-19 tracker app, and in order to do that the research is divided into two main parts, which is front-end and back-end application. This is accomplished by combining a number of tools and programs such as Android Studio, Java Programming Language, Extensible Markup Language (XML), Google's Firebase program, a web-based corona API website and many other visual aspects that will for sure make it quite enjoyable and educational for the user to use. By building an app as such, that we can help in educating people on the Covid-19 virus while making it easier for the user to reach for help in case of an infection and hence reveals very promising results.

**Keywords:** Covid-19, tracker, android based, XML, Firebase program, covi.

---

## I. INTRODUCTION

The world is facing one of the worst epidemics of all time, a tragedy which resulted in more than 3 million deaths recorded worldwide, with many more people yet expected to lose their lives, Covid-19 is a contagious disease which was first identified in Wuhan, china in December 2019, and has since spread worldwide causing a global on-going pandemic [1]. In an effort to slow down this deadly pandemic many countries around the world have halted many of their everyday activities, by stopping non-beneficial businesses, schools, and many profitable attractions, while requesting their citizens to stay at home. Countries worldwide are now starting to suffer the downsides of these actions, this pressured them to start looking for solutions that can somehow help in reducing their ongoing losses, such solutions are: online schools, home-based jobs, as well as creating many vaccines that can be accessible to anyone who is in the extreme need to travel.

Now many countries are in the need for digital tracking, tracing and analytical websites and applications to be introduced globally in order to contain the Covid-19 pandemic, this solution has appealed to many of the countries researchers and programmers due to how easy it is to implement due to the fact that almost half of the world's population carries some sort of an electronic device, such as smartphones. Programmers and researchers have now been requested to develop some sort of an alert system that can help in tracking the on-going spread of this deadly pandemic. This System should enhance the ability to disseminate information, tracking suspected cases, as well as managing any confirmed case. The developed android application will ensure that the user will be provided with the most up to date accurate health information. The app's home screen will allow the user to view all the information in one place without the need to browse the web to collect different types of data. The data will stay updated as long as the user's device is connected to the Wi-Fi.

The aim of this project is to provide a Covid-19 tracker application that can offer a great variety of content that can be shared with the user, such content include a disease case counter, a list of precautions that can help the user in avoiding the virus, symptoms information, a report case option, informative charts and databases, worldwide information access, as well as many other features to offer. This application is developed in hope that in the nearby future it can be of great help in reducing the increasing numbers of contacted cases by informing and educating the current society on this deadly disease while providing a fun as well as an interactive platform that can provide updated real time information for our users. The main advantage of this application is the ability to accustom it to any new emerging diseases that can develop in the future

This application's system will have a front-end portal where customers will be able to interact with our product by the help of the Java Programming Language, as well as a back-end which will be supported by a Corona API website database as well as the Firebase Program which will be responsible for the user authentication as well as storing user data in a practical database. Android studio will be used as the framework for this specific project to facilitate software development, maintenance and upgrading. The system will also be written in Java Language.

### A. Apple COVID-19 App

Apple Inc. is an American multinational technology company that that designs, develops, and sells consumer electronics, computer software, and online services. It is headquartered in Cupertino, California. Apple was founded by Steve Jobs, Steve Wozniak, and Ronald Wayne in April 1976, but it was then incorporated as Apple Computer, Inc., in January 1977 [2]. It is considered to be one of the Big Five companies in the U.S. information technology industry, along with Amazon, Google, Microsoft, and Facebook. It is one of the most popular smartphone and tablet companies in the world. The Apple COVID-19 tracker app was developed in partnership with the Centers for Disease Control and Prevention (CDC), the White House, and the Federal Emergency Management Agency (FEMA). This app has up-to-date information, a screening tool, as well as a testing page [3]. The app is free to use. Images from Apple Covid-19 Tracking app are shown below in Fig 1 (a & b). Maintaining the Integrity of the Specifications.



Fig. 1. (a & b) Apple COVID-19 Home Page

### B. HEALTHLYNKED COVID-19 Tracker App

HealthLynked Corp. was launched in Naples, Florida, in 2016 by Dr. Michael Dent, the visionary behind NeoGenomics. Dr. Michael Dent wanted to find a way to make data sharing, patient management, and research easier and more accessible to more people and physicians [4].

HealthLynked has developed its own Corona Virus tracker that allows users to self-report symptoms, if they test positive for the virus, alert contacts so that they can seek medical care to prevent spread, as well as provide real time statistics. The app is free to use. Images from the HEALTHLYNKED Covid-19 Tracking app are shown below in figures 2. and 3.



**Fig. 2. B. HEALTHLYNKED COVID-19 Tracker App Screen and Dashboard Page**



Figure 2.7 HEALTHLYNKED COVID-19 Show Map Page

Figure 2.8 HEALTHLYNKED COVID-19 Feeds Page

**Fig. 3.(a & b) Map and Feeds Page**

## II. PROJECT METHODOLOGY

The Project Methodology can be defined as a collection of methods, practices, processes, techniques, procedures, as well as rules which are used in the project management and methodologies. They are characterised to be extremely specific and strict, and can only operate by following a series of steps for each phase of the project's life cycle until the project is successfully completed and terminated. The purpose of the project methodology is to enable app software system to be efficiently controlled, standardized and structured in order to have an organized system that can allow the repetition of the successful aspects in the system making the system more effective in terms of the decision making process as well as the problem solving process, resulting in continuous system improvements [5].

Typically, in this kind of system methodology the project manager is provided with the main skeleton of the system in order for him to be able to understand every step in the system in a deep way, this helps him in knowing what is needed from him in order for him to deliver and implement the system word according to the specific schedule, budget as well as the client's specification. In conclusion, in order for us to build a successful Methodology we need the following components:

- Planning: A plan should be set to decide what should be done.
- Documentation: Documents specified to the soon-to-be developed project
- Technique: In order for us to successfully build a controlled project a set of standard techniques should be used
- Sequence: In order for the project to be built in an organized way a specific order should be followed while implementing the system's steps

- Overview: The final result should always be pictured in order for us to know how the project's documentation and techniques are going to fit together In order for us to make this more understandable we are going to explain each step of the analysis process (Model Methodology, System Analysis, Feasibility Study, And the System Design) required in order for us to complete this project.

### III. AGILE MODEL METHODOLOGY

The entire development procedure of this Covid-19 Tracker Mobile App is based on the System Development Life Cycle which can be defined as the structured sequence of stages or phases that are used to develop the intended software system end product. Here we are going to use the Agile Model methodology in order to design this Covid-19 tracker system. An Agile Model Methodology is a type of software development that is solely based on the idea of iterative development, where each task is broken down into several smaller iterations, each small iteration has a short time frame in order to reduce the overall project delivery time. In order to be able to break down all of these system tasks we first need to be able to grasp the project scope and requirements from the beginning of the project initiation. Once identified these steps are then designed, run, and tested producing the final result of the System Development Life Cycle. This can help simplify the Covid-19 tracker app development processes making it easier for the final product to adapt after its release [6]. In order for us to develop the intended Covid-19 Tracker Mobile Based App using the Agile Model we must go through several phases; these phases are listed as the following:

Requirements gathering

2. Requirements design

3. Construction and step iteration

4. Testing/ Quality check

5. Deployment

6. Client / Customer Feedback

By following the above phases, we can ensure that our Covid-19 Tracker Mobile Based App will be effectively build using the Agile Model Methodology delivering the best results meeting the customer's expectations.

Using the Agile Model Methodology makes it easier for us to manage the system's complexity since each process is broken down into smaller iterations making it easier for us to do rapid changes to the system cycle, this can help us in incorporating the client's changing demands throughout the development process [7]. This can raise the client's and customer's satisfaction since their demands can be meet and changed quickly and effectively using the Agile Model. Using the Agile Model can help us in achieving several benefits over the traditional method of application development, these benefits include the following:

Clients and customers are closely involved in the development process

Decision-making can be quite fast using the Agile Model

Shorter system development delivery time

High customer satisfaction rate

Customers and clients are guaranteed to get what they exactly want/desire

Provide an effective, efficient, and quick system development process

Visibility

Cost control

The ability to personalize the project according to the client's needs • Ability to adapt to change even at late stages

Can be used to predict the project's costs and schedule

Let's not forget that using the Agile Model can also offer massive decision-making opportunities, since each step is required to get through quality checks routinely.

#### IV. SYSTEM DESIGN

In order for us to implement the following system, we have already analysed and designed the system's software application, so that all the system's designs can be implemented while taking into consideration the success rate of the system as well as the system's timeframe. During this phase, the main purpose of the system design is to try to explain the how the system is going to work from the start to the end [8].

The system design was proposed using the following stages, these stages illustrates the software application of the Covid-19 tracker app:

- Work Flow Diagram
- Use Case Diagram
- Entity Relationship Diagram
- Application Map Diagram
- Timeline Chart

##### A. Flow Chart

Flowcharts are diagrams or graphical representations of either a workflow or a process.

The processes and workflows are always represented using a step-by-step approach, where each step is represented using symbolic shapes, while the process flow is usually always indicated using arrows which serves the purpose of connecting the steps' symbolic shapes. Here Figure 4 shows the Flowchart for the Covid-19 tracker application (mobile based app to be designed (The following flow chart was designed using "Smart draw" [9].

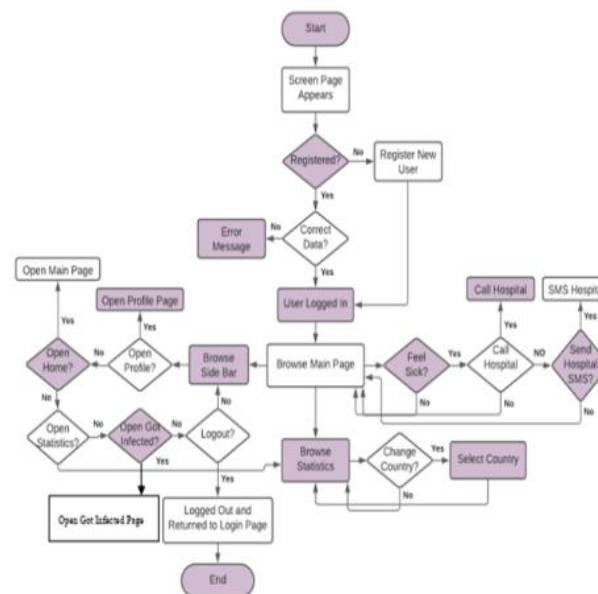
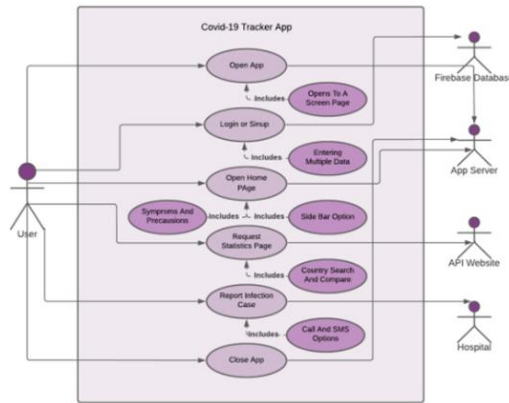


Fig. 4. Covid-19 Tracker App Flowchart

##### B. Use Case Diagram

A use case diagram is a graphical representation of the expected user interaction with the system. The use case diagram models the functionality of the system using actors and use cases. While the actors are considered to be different kinds of users, people, or entities serving different roles within the system, the use cases are considered to be a set of actions, services, or functions that the system is expected to perform. Since a use case is a methodology used in the system analysis phase to identify, clarify, and organize system requirements, this diagram will be used to also identify if there are any other internal or external factors that may influence the system. In order to do that we have designed the following use case diagram shown in Figure 5 to show the interaction between the different actors, use cases, and the system [10].



**Fig. 5. COVID-19 Tracker App use case study**

## V. USER INTERFACES OF THE COVID-19 TRACKER APP

### A. Screen Page

Figure 6 below shows the first visible screen to the user upon opening the Covi application. Since this is the first ever page interface of our user it is quite vital to attract the user by using this page’s design. This page will give the user an overall idea of the App.



**Figure 6. Covi Tracker App Logo**

### B. Login Page

Figure 6 shows the Login Page graphical user interface where the user will be asked to either login or signup. An existing user can simply just login into the app system by listing down his name, email, and his password, he also has the option to check the box in order for the system to always remember him so that he can easily access the app whenever he opens it without the need to always login. Whereas if the user doesn’t have an existing account, he can simply be redirected to the sign-up page when he clicks on the sign-up button option where he is required to fill in the required information.

### C. Home Page

Figure 7 shows the Home Page graphical user interface where it is considered to be the main page of our app Covi, here the user can interact with many different features while staying on the user home page, some of these features are: Are you feeling sick? Case report button which is divided into a call button and a send an SMS message button which will be stimulated once clicked by the user to take action, a Covid-19 prevention list containing different related images, a Covid-19 symptoms list containing different related images, a side bar button, a profile side button and finally a see statistics button which will redirect the user to the statistics page.

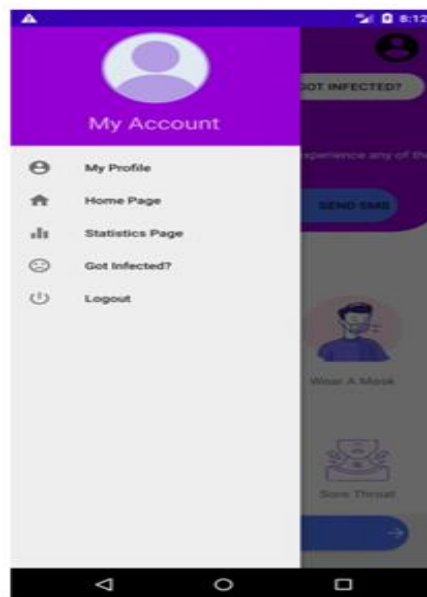




**Figure 7. Covi Tracker App Login Page**

#### **D. Scroll Bar Page**

Figure 8 shows the Scroll Bar graphical user interface page, it is a page that is activated by the user once he presses side bar button option, which is located on the left side of the home page, the button then opens a side bar. Here we can see that different options are offered for the user to act upon, some of these options include My profile redirection option, a home page redirection option, a statistics re-direction option, a “Got infected?” redirection option, and lastly a logout option that will allow the user to logout of his account as well as redirect him to the app’s Login page.



**Fig. 8. Covi Tracker App Scroll Bar Page**

#### **E. Statistics Page**

Figure 9 shows the Statistics Page graphical user interface where the user controls the statistics page by simply selecting a country, that can be done by clicking on the country name button (here listed as Malaysia), which then updates the page to the user’s selected country’s statistics. These statistics are shown using different types of graphical representations including a chart data explanation graph as well as data boxes whose main purpose is to show the different data numbers which are updated from a web-based Covid-19 API, these data numbers involve the infected cases numbers, the death numbers, the recovered numbers, as well as the active infections numbers.



**Fig. 9. Covi Tracker App Statistics Page**

**F. Countries Statistics Page**

Figure 10 shows the Countries Statistics Page graphical user interface which shows the app page that is activated once the user clicks on the country name button located on the app’s statistics page. In this page we can clearly see that the user has the option of searching for his desired country by using the search bar located in the above section of the page. The user also has the capability of scrolling down all the country options by hand, in order for him to compare all the countries total infection cases which will be listed on the right side of each country, this gives user the ability to compare any country’s data with another country’s as well as educating the user about the world wide total infection cases.



**Fig. 10. Covid-19 Tracker App Country Statistics Page**

**G. Profile Page**

Figure 11 shows the Profile graphical user interface which shows the user’s profile page, by accessing this page the user can see all his data which includes his: Name, Email, Phone Number as well as his password. This page can be accessed from different locations such as the main page’s profile button, the main page’s scroll bar, the statistics profile button as well as other locations making it easy for the user to always access this page. This page displays the user’s data by retrieving the saved data from the Firebase program.





**Fig. 11. Covi Tracker App Profile Page**

### H. Got Infected? Page

Figure 12 shows the Got infected? graphical user interface which shows the user what to do in case he has already been infected with the Covid-19 virus, this page will contain some useful data and tips in order to benefit the user as much as possible while he can't get access to professional care. The user can access this page through the side bar by clicking on the Got Infected? option or by clicking the Got Infected button in the home page, he then will be redirected to this page for more information.



**Fig. 12. Covi Tracker App Got Infected? Page**

## VI. CONCLUSION

COVI is a Covid-19 Tracker App which is a mobile based android application, which enables the customer to check many of the virus related information from anywhere at any time, this can help in educating the user on this deadly virus by keeping him updated all the time with useful information, such information includes: the virus statistics, the virus's symptoms, the precautions to be taken, what to do if you get infected, as well as to offer the user a report case button

where he can either call or SMS a hospital in case he gets infected with the virus. This mobile based android application is easy and convenient to use, since all what's is required mobile phone, a Wi-Fi connection, a phone number, an Email address and the Google play store in order to download the app. Moreover, not only does this application provide all of this information in one place, making it easier than navigating the web for multiple data, but it also allows the user to compare worldwide data simply by scrolling down.

Finally, the aim of this COVID-19 Tracker app is to make the user as educated as possible on the COVID-19 virus which is now spreading all over the world in multiple different forms, and that is by providing him with as much data as possible on the virus from all over the world.

### REFERENCES

- [1] About Covid-19 virus (from Wikipedia): <https://en.wikipedia.org/wiki/COVID-19>
- [2] Apple Covid-19 Tracker App: <https://apps.apple.com/us/app/apple-covid-19/id1504132184>
- [3] Healthlynked Covid-19 Tracker App: <https://apps.apple.com/tr/app/healthlynked-covid-19-tracker/id1500575377?l=tr>
- [4] Covid-19! Tracker App: <https://apps.apple.com/tr/app/covid-19/id1504906590?l=tr>
- [5] About Apple: [https://en.wikipedia.org/wiki/Apple\\_Inc](https://en.wikipedia.org/wiki/Apple_Inc).
- [6] About Apple Covid-19 app: <https://apps.apple.com/us/app/apple-covid19/id1504132184>
- [7] AboutHealthlynked: [https://www.google.com/search?q=healthlynked+corp&sxsrf=ALeKk038TqZ3Ux8n10hDifMdYMckn6Sg%3A1622395376501&ei=8MmzYOKPHoT6sAegKCIDg&oq=healthlynked+corp&gs\\_lcp=Cgdnd3Mtd2l6EAMyBAgjECcyBwgAEIcCEBQyAggAOgcIIxCwAxAnOgcLABBHELADogYIABAWEB5QvwtYvRlggR1oAXACeACAAfYBiAH7BZIBBTMuMi4xmAEAoAEBqgEHZ3dzLXdpegBCsABAQ&sclient=gws wiz&ved=0ahUKEwjixfg9fHwAhUEPewKHT4ACOEQ4dUDCA4&uact=5](https://www.google.com/search?q=healthlynked+corp&sxsrf=ALeKk038TqZ3Ux8n10hDifMdYMckn6Sg%3A1622395376501&ei=8MmzYOKPHoT6sAegKCIDg&oq=healthlynked+corp&gs_lcp=Cgdnd3Mtd2l6EAMyBAgjECcyBwgAEIcCEBQyAggAOgcIIxCwAxAnOgcLABBHELADogYIABAWEB5QvwtYvRlggR1oAXACeACAAfYBiAH7BZIBBTMuMi4xmAEAoAEBqgEHZ3dzLXdpegBCsABAQ&sclient=gws wiz&ved=0ahUKEwjixfg9fHwAhUEPewKHT4ACOEQ4dUDCA4&uact=5)
- [8] About NEMOCNICE MILOSRDNYCH BRATRI: <https://www.nmbbrno.cz/historie>
- [9] Smartdraw:<https://www.smartdraw.com/support/cloudbrowserwarning.htm#depoId=27076375&credID=-34825754>
- [10] Smartdraw:<https://www.smartdraw.com/support/cloudbrowserwarning.htm#depoId=27076375&credID=-34825754>