

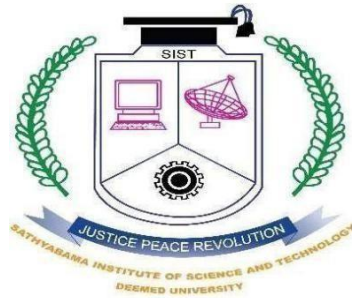
COVID-19 TRACKING AND VISUALIZATION APP

Submitted in Partial Fulfillment of The Requirements For The

Award Of

Bachelor of Engineering Degree in Computer Science and Engineering By

GURRAM MANMOHAN(Reg. No.37110260)



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF COMPUTING**

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with Grade “A” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI -

600119

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SATHYABAMA

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DEPARTMENT OF COMPUTER SCIENCE AND

ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this project report is the bonafide work of **GURRAM MANMOHAN**(Reg NO.37110260)who carried out the project entitled "COVID-19 TRACKING AND VISUALIZATION APP" under my supervision from November 2019 to April 2020.

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ABSTRACT

corona virusdisease 2019 (COVID-19) is because of a brand new corona virusfirst identified in Wuhan, China, in December 2019. because it is a brand new virus, scientists are getting to know more every day. Although the majority who've COVID-19 have slight symptoms, COVID- 19 can also cause intense infection or even demise. a few corporations, together with older adults and those who've certain underlying scientific conditions, are at accelerated risk of extreme contamination So monitoring and Visualization of COVID-19 cases and simply representing the information for a higher understanding of the COVID-19 instances around the world helps humans recognize the present-day state of affairs and to try this a cellular application is a fine way. In this article, I summarize and illustrate with examples the way to amass and Visualize the statistics of the COVID-19 cases in a cellular application using Flutter.

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LIST OF ABBREVIATIONS

COVID-19	Corona virus 2019
IOS	iPhone Operating System
UX	User eXperience
UI	User Interface
SDK	Software Development Kit
API	Application Programming Interface
CSV	Comma-Separated Values
JSON	JavaScript Object Notation

CHAPTER 1

INTRODUCTION

The COVID-19 outbreak has put everyone in an unprecedented difficult situation that has made life around the world stop and claims thousands of lives. Due to the COVID-19 spread in 212 countries and territories and the increase in the number of infected cases and the death toll in 11,07,49,023 and 24,55,131 (as of 22 February 2021), it remains a real threat to the public health system. On 11 February 2020, the World Health Organization announced an official name for the disease that is causing the corona virus outbreak of the 2019 novel. The new name of this disease is corona virus disease 2019, abbreviated In COVID-19. In COVID-19, 'CO' means 'crowns', 'VI' for 'Viruses', and 'D' for the disease. Previously, this disease was defined as "New corona virus 2019" or "2019-NCOV". Corona virus, named after the indigenous councils on its surfaces, is a large family of common viruses in people and many types of animals, including camels, cattle, cats, and bats. There are many types of human corona virus, some of which often communicate with light respiratory diseases. covid 19 is a new disease caused by a novel (or new) corona virus, which is not yet visible in humans. Infected corona virus rarely infected people and distributed among people. All three viruses have their origin in fleeting mice. W. Patal sequences are similar to the fact that China has initially published and offers a unique and recent unique emergency in this virus. The exact source of this virus. It was not defined. People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches

- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose

There are some measures to be taken for slowing down the spread of the virus

- Get a COVID-19 vaccine.
- Wear a mask to protect yourself and others and stop the spread of COVID-19.
- Stay at least 6 feet (about 2 arm lengths) from others who don't live with you.

Influenza (Flu) and COVID-19 are both contagious respiratory illnesses, but they are caused by different viruses. COVID-19 is caused by infection with a new corona virus (called SARS-CoV-2), and flu is caused by infection with influenza viruses.

COVID-19 seems to spread more easily than the flu and causes more serious illnesses in some people. It can also take longer before people show symptoms and people can be contagious for longer. More information about the differences between flu and COVID-19 is available in the different sections below.

If you are trying to follow Covid-19 cases, one of the most preferred methods is based on any open source site for data collection and not on a source that does not contain enough data or data that is wrong. Solutions can lead to solutions. Some websites and bees that can reciprocate them are [Covid19India.org](https://covid19india.org) (for India), the disease.sh (for the world), [Covid19.who.int](https://covid19.who.int) (for the world). For more information, you can visit the RapidAPI website and search API on COVID-19 and log in to every complimentary service.

CHAPTER 2

LITERATURE SURVEY

[1] On December 31, 2019, Chinese health officials reported a cluster of cases of acute respiratory illness in persons associated with the Hunan seafood and animal market in the city of Wuhan, Hubei Province, in central China. On January 7, 2020, Chinese health officials confirmed that a novel coronavirus (2019-nCoV) was associated with this initial cluster (1). As of February 4, 2020, a total of 20,471 confirmed cases, including 2,788 (13.6%) with severe illness,* and 425 deaths (2.1%) had been reported by the National Health Commission of China (2). Cases have also been reported in 26 locations outside of mainland China, including documentation of some person-to-person transmission and one death (2). As of February 4, 11 cases had been reported in the United States. On January 30, the World Health Organization (WHO) Director-General declared that the 2019-nCoV outbreak constitutes a Public Health Emergency of International Concern.

[2] An outbreak of coronavirus disease 2019 (COVID-19) caused by the 2019 novel coronavirus (SARS-CoV-2) began in Wuhan, Hubei Province, China in December 2019, and has spread throughout China and to 31 other countries and territories, including the United States (1). As of February 23, 2020, there were 76,936 reported cases in mainland China and 1,875 cases in locations outside mainland China (1). There have been 2,462 associated deaths worldwide; no deaths have been reported in the United States. Fourteen cases have been diagnosed in the United States, and an additional 39 cases have occurred among repatriated persons from high-risk settings, for a current total of 53 cases within the United States. This report summarizes the aggressive measures (2,3) that CDC, state and local health departments, multiple other federal agencies, and other partners are implementing to slow and try to contain transmission of COVID-19 in the United States.

[3] In January 2020, with support from the U.S. Department of Homeland Security (DHS), CDC instituted an enhanced entry risk assessment and management (screening) program for air passengers arriving from certain countries with widespread, sustained transmission of SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19). The objectives of the screening program were to reduce the importation of COVID-19 cases into the United States and slow subsequent spread within states.

[4] A new coronavirus, severe acute respiratory syndrome coronavirus 2, was first discovered in Wuhan, China, in December 2019. As of 7 April 2020, the new coronavirus has spread quickly to 184 countries and aroused the attention of the entire world. No targeted drugs have yet been available for intervention and treatment of this virus. The sharing of academic information is crucial to risk assessment and control activities in outbreak countries. In this review, we summarize the epidemiological, genetic and clinical characteristics of the virus as well as laboratory testing and treatments to understand the nature of the virus. We hope this review will be helpful to prevent viral infections in outbreak countries and regions.

[5] A novel coronavirus, designated as 2019-nCoV, hit the central Chinese city of Wuhan in late December 2019, and subsequently spread rapidly to all provinces of China and multiple countries. As of 0:00 am February 9, 2020, a total of 37,287 cases have been confirmed infection of 2019-nCoV in China mainland, and 302 cases have also been cumulatively reported from 24 countries. According to the latest data, a total of 813 deaths occurred in China mainland, with the mortality reaching approximately 2.2%. At present, there is no vaccine or specific drugs for the human coronavirus. Therefore, it is critical to understand the nature of the virus and its clinical characteristics, in order to respond to the 2019-nCoV outbreak. Thus, the present study briefly but comprehensively summarizes the not much but timely reports on the 2019-nCoV.

CHAPTER 3

METHODOLOGY

AIM OF THE PROJECT

To implement corona virus tracking application using flutter for Android, IOS, and also for web.

SYSTEM REQUIREMENTS

PC REQUIREMENTS

➤ Hard disk	:	500 GB and above.
➤ Processor	:	i5 and above.
➤ Ram	:	8GB and above
➤ Operating System	:	Windows 7/LINUX/MAC
➤ Flutter	:	1.7 and above

MOBILE HARDWARE REQUIREMENTS

➤ Memory	:	256 MB and above
➤ Ram	:	128 MB and above
➤ OS	:	Android or IOS

EXISTING SYSTEM

Existing system is an Android and IOS application developed by the Indian government with the name of “Arogya Setu”. This app keeps track of cases within the range of 500m to 10km around the user and has the confirmed case data of all the states in India.

DISADVANTAGES

- It doesn't show the district data, world cases data and UI is not modern UI with interaction.
- Although there are many websites for tracking and visualizing corona virus cases there are only a few mobile applications available most of them lack interactive UI and contain fewer data.

PROPOSED SYSTEM

A system is proposed with an Interactive UI and contains all the data on corona virus cases all over India along with its states and districts. This app was developed using Flutter 2.0 so that with a single written code the application should run on Android, IOS, and also has a Web Application.

OVERVIEW OF THE PLATFORM

FLUTTER

Flutter was released in 2017 by Google. The apps, which are developed with this framework, are written in Dart language. Dart resembles JavaScript as far as the simplicity of syntax is concerned. This means it is relatively easy to learn. Recently Flutter 2.0 was Released with major features.

FEATURES OF FLUTTER

- **Cross-platform:** Anything you create on Flutter can be run on both Android and IOS. Apart from mobile development, you can also use Flutter to make web and desktop applications.
- **Truly native:** Unlike hybrid development, Flutter provides its software with native performance, smooth and quick. The reason for that is the Dart code, which is compiled beforehand.
- **Widgets:** Flutter provides a developer with off-the-shelf widgets that are used for the elements of the user interface. Moreover, there are two styles of UI elements to suit the standards of Android and iOS. Furthermore, they can be combined to create something even more complicated, as well as new elements of UI can be created from scratch.
- **Hot reload:** The process of compilation is time-consuming and annoying. When you need to implement a small change into the code, you have to wait for a program to compile. However, this problem was solved by the implementation of the hot reload feature that allows a developer to amend the code on the go.

This means that a program you develop can be currently running and the changes you make are implemented instantly. Such a feature is not unique because some of the other frameworks also offer it, but having used it once, you will never want to code without it.

- **Web:** Flutter's web support has transitioned from beta to the stable channel. With this initial stable release, Flutter pushes the reusability of code to another level with the support of the web platform. So now when you create a Flutter app in the stable, the web is just another device target for your app. By leveraging the web platform's many strengths, Flutter built a foundation for building richly interactive web applications.
- **Sound Null Safety:** Sound null safety is a significant addition to the Dart language, which further strengthens the type system by distinguishing null able types from non-null able types. This enables developers to prevent null error crashes, a common reason for apps to crash. By incorporating null checks into the type system, these errors can be caught during development, thus preventing crashes in production. Sound null safety is fully supported in the stable as of Flutter 2, which contains Dart 2.12.
- **Support from Google:** Flutter is Google's beloved child, on which it anchors big hopes. That is why Google always strays behind Flutter. The interest of Google towards Flutter is completely pragmatic. In a situation where an IOS development company starts using Flutter, Google can also run its software on its Android system. Moreover, Google works on its new operating system Fuchsia. Guess what? Once it is ready, it will be able to run all the apps that were developed with Flutter. That is a perfect example of a win-win strategy.

Pros

- **Fast development:** Since with Flutter your development process is cross-platform, it considerably reduces the time

of releases, fixes, and updates.

- **Audience reach:** Another consequence of cross-platform development is the coverage of both audiences: IOS and Android users.
- **Cheaper development:** One more outcome of cross- platform development is that you will not need two teams for both platforms. This will save you much of a budget.
- **Elegant UX:** Because of its widgets, the apps developed with Flutter look beautiful as well as they work fast and smooth, like native ones.
- **It is free:** You do not need to raise a Jolly Roger to use Flutter for free. It already costs nothing as well as it is open- source.
- **Localization:** Flutter supports more than 20 languages. Moreover, it has built-in functions to convert different units of measurements so that your customer would not need Vince and Jules to figure out what Quarter Pounder with cheese is.

Cons

- **It is new:** Compared to the other frameworks, Flutter may lack some of the libraries or other ready-made functionality due to its youth.
- **Its apps are large:** The price you pay for the speed and the beauty of the Flutter-made apps is their large size. It may become a problem for the devices with limited space.
- **Small talent pool:** Since the technology is new, it is hard to find Flutter developers.

Installation in Windows

To install and run Flutter, your development environment must meet these minimum requirements:

- *Operating Systems:* Windows 7 SP1 or later (64-bit), x86-64 based

- *Disk Space*: 1.64 GB (does not include disk space for IDE/tools).
- *Tools*: Flutter depends on these tools being available in your environment.
 - Windows PowerShell 5.0 or newer (this is pre-installed with Windows 10)
 - Git for Windows 2.x, with the Use Git from the Windows Command Prompt option.

If Git for Windows is already installed, make sure you can run git commands from the command prompt or PowerShell.

Let's see how to install Flutter SDK and its requirement in a windows system.

1. Go to URL, <https://flutter.dev/docs/get-started/install/windows> and download the latest Flutter SDK. As of March 2021, the version is 2.0.1 and the file is flutter_windows_v2.0.1-stable.zip.
2. Unzip the zip archive in a folder, say C:\flutter\
3. Update the system path to include flutter bin directory.
4. Flutter provides a tool, flutter doctor to check that all the requirement of flutter development is met.
5. Running the "flutter doctor" command will analyze the system and show its report as shown below

```
mohan@mohan-gf63thin8sc:~ — Konsole
File Edit View Bookmarks Settings Help
[mohan@mohan-gf63thin8sc ~]$ flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, 2.0.1, on Linux, locale en_IN)
[✓] Android toolchain - develop for Android devices (Android SDK version 30.0.3)
[✓] Chrome - develop for the web
[!] Android Studio (not installed)
[✓] Connected device (1 available)

! Doctor found issues in 1 category.
[mohan@mohan-gf63thin8sc ~]$
```

Fig 3.1 Flutter doctor

The report says that all development tools are available but the device is not connected. We can fix this by connecting an android device through USB or starting an android emulator.

6. Install the latest Android SDK, if reported by flutter doctor
7. Install the latest Android Studio, if reported by flutter doctor
8. Start an android emulator or connect a real android device to the system.
9. Install Flutter and Dart plugin for Android Studio. It provides startup template to create new Flutter application, an option to run and debug Flutter application in the Android studio itself, etc.,
 - ◆ Open Android Studio.
 - ◆ Click File → Settings → Plugins.
 - ◆ Select the Flutter plugin and click Install.
 - ◆ Click Yes when prompted to install the Dartplugin.
 - ◆ Restart Android studio.

Installation in MacOS

To install and run Flutter, your development environment must meet these minimum requirements:

- Operating Systems: macOS (64-bit)
- Disk Space: 2.8 GB (does not include disk space for IDE/tools).
- Tools: Flutter uses git for installation and upgrade. We recommend installing Xcode, which includes git, but you can also install git separately.

To install Flutter on MacOS, you will have to follow the following steps –

1. Go to URL, <https://flutter.dev/docs/get-started/install/macos> and download latest Flutter SDK. As of March 2021, the version is 2.0.1 and the file is flutter_macos_v2.0.1-stable.zip.
2. Unzip the zip archive in a folder, say /path/to/flutter
3. Update the system path to include flutter bin directory (in ~/.bashrc file).
4. Run the following command "> export PATH = \"\$PATH:/path/to/flutter/bin\"".
5. Enable the updated path in the current session using below command and then verify it as well.
6. Run the following commands:
 - `source ~/.bashrc`
 - `source $HOME/.bash_profile`
 - `echo $PATH`

Flutter provides a tool, flutter doctor to check that all the requirement of flutter development is met. It is similar to the Windows counterpart.

7. Install latest XCode, if reported by flutter doctor
8. Install latest Android SDK, if reported by flutter doctor
9. Install latest Android Studio, if reported by flutter doctor
10. Start an android emulator or connect a real android device to the system to develop android application.
11. Open iOS simulator or connect a real iPhone device to the system to develop iOS application.
12. Install Flutter and Dart plugin for Android Studio. It provides the startup template to create a new Flutter application, option to run and debug Flutter application in the Android studio itself, etc.,

- Open Android Studio
- Click Preferences → Plugins
- Select the Flutter plugin and click Install
- Click Yes when prompted to install the Dartplugin.
- Restart Android studio.

Installation in LINUX

To install and run Flutter, your development environment must meet these minimum requirements:

- Operating Systems: Linux (64-bit)
- Disk Space: 600 MB (does not include disk space for IDE/tools).
- Tools: Flutter depends on these command-line tools being available in your environment.
 - bash
 - curl
 - file
 - git 2.x
 - mkdir
 - rm
 - unzip
 - which
 - xz-utils
 - zip
- Shared libraries: Flutter test command depends on this library being available in your environment.
 - libGLU.so.1 - provided by mesa packages such as libglu1-mesa on Ubuntu/Debian and mesa-libGLU on Fedora.

The easiest way to install Flutter on Linux is by using snapd. For more information, see Installing snapd. Once you have snapd, you can install Flutter using the Snap Store, or at the command line:

```
$ sudo snap install flutter --classic
```

If you don't have snapd, or can't use it, you can install Flutter using the following steps.

1. Download the following installation bundle to get the latest stable release of the Flutter SDK
2. Extract the file in the desired location, for example:
 - `cd ~/development`
 - `tar xf ~/Downloads/flutter_linux_2.0.1-stable.tar.xz`

If you don't want to install a fixed version of the installation bundle, you can skip steps 1 and 2. Instead, get the source code from the Flutter repo on GitHub with the following command:

- `git clone https://github.com/flutter/flutter.git`

You can also change branches or tags as needed. For example, to get just the stable version:

- `git clone https://github.com/flutter/flutter.git -b stable --depth 1`

Add the flutter tool to your path:

- `export PATH="$PATH:$(pwd)/flutter/bin"`

This command sets your PATH variable for the current terminal window only. To permanently add Flutter to your path, see Update your path.

3. Optionally, pre-download development binaries: The flutter tool downloads platform-specific development binaries as needed. For scenarios where pre-downloading these artifacts is preferable (for example, in hermetic build environments, or with intermittent network availability), iOS and Android binaries can be downloaded ahead of time by running:
 - `flutter precache`

For additional download options, see `flutter help precache`.

4. Run the following command to see if there are any dependencies you need to install to complete the setup (for verbose output, add the `-v` flag):
 - `flutter doctor`

This command checks your environment and displays a report to the terminal window. The Dart SDK is bundled with Flutter; it is not necessary to install Dart separately. Check the output carefully for

other software you might need to install or further tasks to perform.

SYNCFUSION FLUTTER WIDGETS

The Syncfusion Flutter UI widgets are the suite you ever need to create rich and high-quality cross-platform applications in IOS, Android, and Web from a single code base.

Syncfusion offers over 1,600 components and frameworks for mobile, web, and desktop development, and we're confident that our ready-to- deploy enterprise software will help get your products to market faster. With endless customization options, you can deliver an optimal user experience while saving development time and costs.

Flutter Charts package is a data visualization library written natively in Dart for creating beautiful, animated, and high-performance charts, which are used to craft high-quality mobile app user interfaces using Flutter.

This `syncfusion_flutter_charts` package includes the following widgets

- `SfCartesianChart`
- `SfCircularChart`
- `SfPyramidChart`
- `SfFunnelChart`
- `SfSparkLineChart`
- `SfSparkAreaChart`
- `SfSparkBarChart`
- `SfSparkWinLossChart`

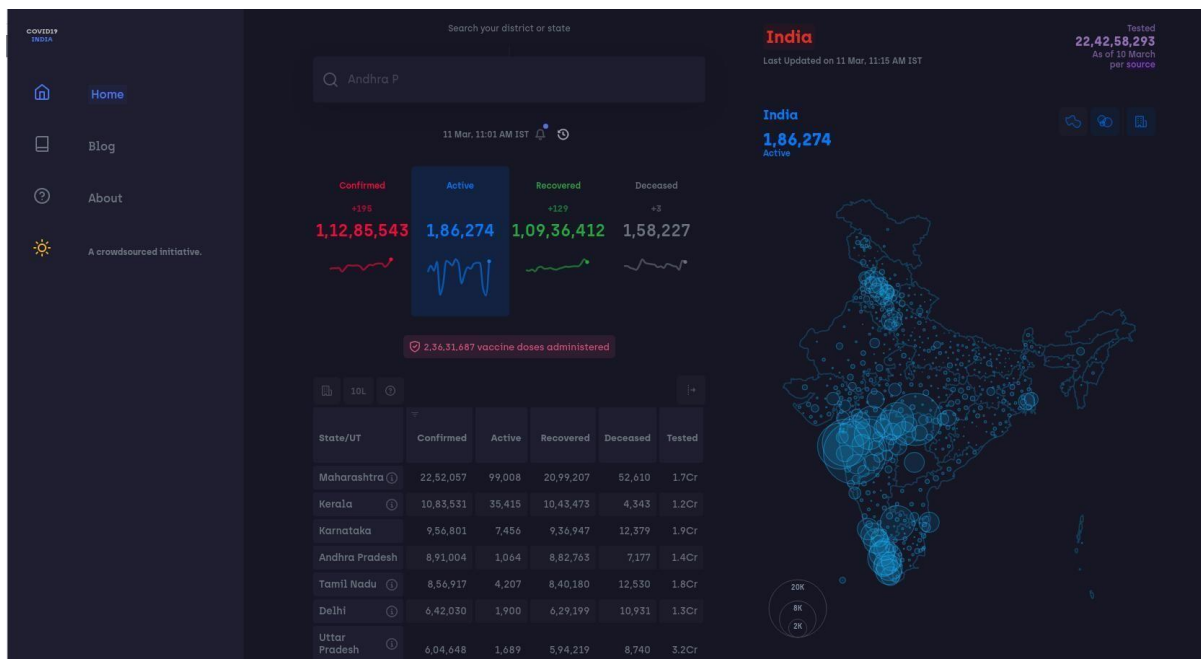


Fig 3.2: Syncfusion Charts

COVID19INDIA API

It's a non-official internet site for tracking the covid-19 instances in India, it is being maintained through a collection of dedicated volunteers who curate and verify the information coming from numerous assets. They extract the information like an affected person's courting with other sufferers to perceive local and network transmissions, travel records, and status. They're the use of nation announcements and authentic handles to update our numbers. The statistics are validated with the aid of a group of volunteers and posted into a Google sheet and an API. API is to be had for all at api.covid19india.org. They may be putting their time and assets without thinking of earning a single penny from us and the purpose for that is to think that it affects every person. nowadays it is a person else who is getting infected; tomorrow it could be us. We want to save you the spread of this virus. We want to file the records so that people with understanding can use these records to make informed choices that make this website even extra incredible.

Fig 3.3: Covid19india website



The above image illustrates the website for API services go to the bottom of the page and click on the database icon. After clicking on the database icon the website will be redirected to a page containing all the CSV files and JSON files.

CSV

Sometimes, having files in a spreadsheet format is more useful for analysts and scientists. We have provided the files as downloadable csv files as below.

Files available

Latest data from the google sheet (10-20 minutes delayed) is available through the `latest` end-point. These are the files available

Raw Data

Status	Sheet Name	Link to CSV	Description
♥	raw_data1	https://api.covid19india.org/csv/latest/raw_data1.csv	Till Apr 19th
♥	raw_data2	https://api.covid19india.org/csv/latest/raw_data2.csv	Apr 20th to Apr 26th
♥	raw_data3	https://api.covid19india.org/csv/latest/raw_data3.csv	Apr 27th to May 9th
♥	raw_data4	https://api.covid19india.org/csv/latest/raw_data4.csv	May 10th to May 23rd
♥	raw_data5	https://api.covid19india.org/csv/latest/raw_data5.csv	May 24th to Jun 4th
♥	raw_data6	https://api.covid19india.org/csv/latest/raw_data6.csv	Jun 05th to Jun 19th
♥	raw_data7	https://api.covid19india.org/csv/latest/raw_data7.csv	Jun 20th to Jun 30th
♥	raw_data8	https://api.covid19india.org/csv/latest/raw_data8.csv	Jul 01st to Jul 7th
♥	raw_data9	https://api.covid19india.org/csv/latest/raw_data9.csv	Jul 08th to Jul 13th
♥	raw_data10	https://api.covid19india.org/csv/latest/raw_data10.csv	Jul 14th to Jul 17th
♥	raw_data11	https://api.covid19india.org/csv/latest/raw_data11.csv	Jul 18th to Jul 22nd
♥	raw_data12	https://api.covid19india.org/csv/latest/raw_data12.csv	Jul 23th to Aug 06th
♥	raw_data13	https://api.covid19india.org/csv/latest/raw_data13.csv	Aug 07th to Aug 21st
♥	raw_data14	https://api.covid19india.org/csv/latest/raw_data14.csv	Aug 22nd to Sep 05th
♥	raw_data15	https://api.covid19india.org/csv/latest/raw_data15.csv	Sep 06th to Sep 21st
♥	raw_data16	https://api.covid19india.org/csv/latest/raw_data16.csv	Sep 22nd to Oct 08th
♥	raw_data17	https://api.covid19india.org/csv/latest/raw_data17.csv	Oct 09th to Oct 26th

Fig 3.4: Covid19india CSV API's

state_district_wise.json

Description

This API gives the district level details of states that includes the totals for all categories and the deltas for **the current day**.

Structure

```
{
  "State Name": {
    "districtData": {
      "DistrictName": {
        "notes": "Any notes to indicate special cases for districts",
        "active": totalActiveCases,
        "confirmed": totalConfirmedCases,
        "deceased": totalDeceasedCases,
        "recovered": totalRecoveredCases,
        "delta": {
          "confirmed": newCasesForToday,
          "deceased": newDeceasedForToday,
          "recovered": newRecoveredForToday
        }
      }
    }
  },
  "statecode": "twoLetterStateCode"
},
{
  ...
},
{
  ...
}
```

The values for delta and totals are per district per state combination.

Fig 3.5: Covid19india JSON API's

CHAPTER 4

APPLICATION DEVELOPMENT METHODOLOGY

ARCHITECTURE

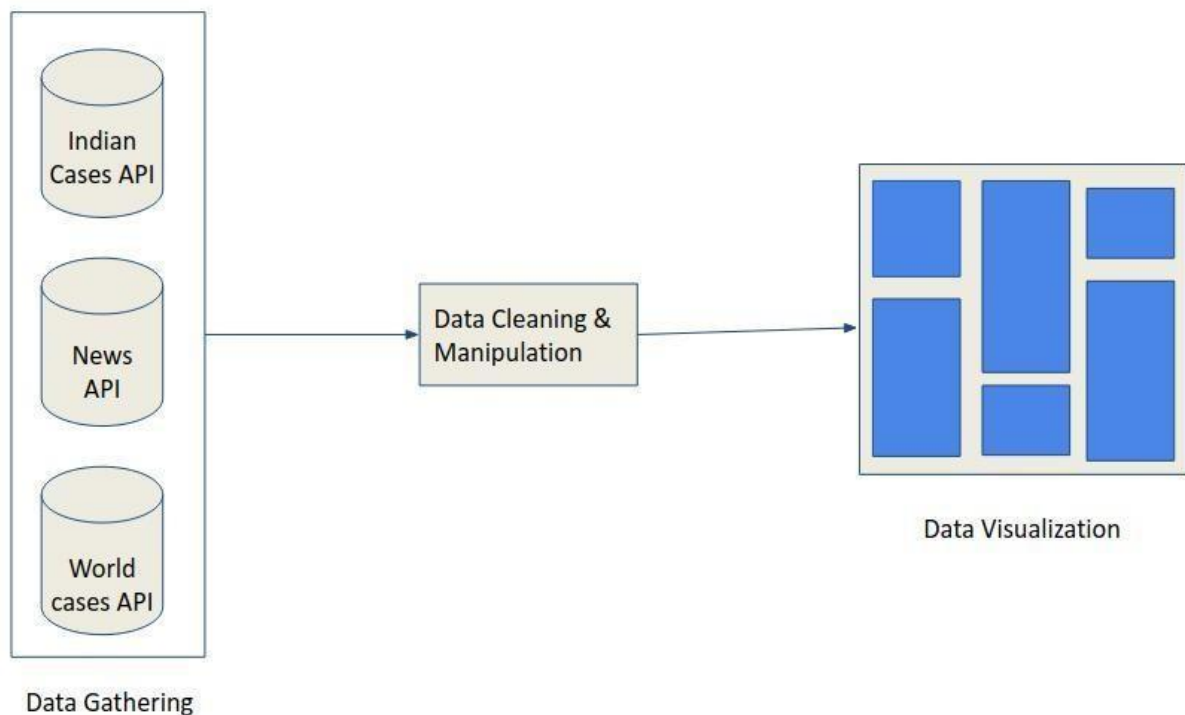


Fig 4.1: System Architecture

As the system architecture demonstrates, the first step for the process is the data gathering process later that data is passed on for the data cleaning and manipulation process after that data is converted to graphs using syncfusion techniques.

Data Gathering

Data Gathering is a process of gathering data from a source or multiple sources. For gathering the data it's better to use the websites that were mentioned above in the Introduction. Those websites can be used as APIs and retrieve the data like covid19india.org can be used for

gathering the COVID-19 cases all over India along with the states and district cases. For collecting world cases, it's better to either use disease.sh or any RapidAPI API's free of cost and also use covid19.who.int but it currently supports the CSV download file and doesn't support API service so it's best to go with the above API services. For Collecting news on the COVID-19 I have used an API from RapidAPI so that I can retrieve the latest news whenever the user desires. As the app is collecting a lot of data from different APIs at the same time it might not collect all the data and after the splash screen, the data can't be collected in the background so for that reason collecting only the necessary data helps. So, In the main activity which is while displaying the splash screen, the app is going to collect all the data from the APIs and store them in local variables. In the main activity, the app is going to collect data like state codes, state names, state cases, news data store them locally, and share them between different pages using class arguments which is one of the easiest ways and for the world and district cases it's better to directly retrieve the data when the page is opened, as the world page has more data and if the data is retrieved in the main activity it might slow down the opening of the app so it's better to retrieve the world cases data when the user opens it and same goes to district cases as it has less data it requires less time for retrieving the data so data will be collected when the user opens it.

Data Cleaning and Manipulation

Data cleaning is a process of removing unnecessary data or removing null data from the data retrieved and the manipulation part is to change the data such that it favors the user for easier understanding of the target. As mentioned above after data gathering categorizing the data is the best option for the future use of the data. So, data from the collection of states can be categorized into four ways.

1. Confirmed - Total Patients affected by the Virus
2. Recovered - Total Patients recovered from the Virus

3. Active - Total Patients remaining after removing the recovered and dead patients from the infected patients
4. Deaths - Total patients dead by the virus

After categorizing data will be stored in different Lists for future usability and management of data. The way of storing the data is also crucial so that it can be easily accessible so that it's better to use dictionaries as the data in it can be accessed easily.

The main problem is to fill the null values if the null values present then the total values of the districts doesn't match the total cases of the state which leads to value error and data corruption. To stop this problem, it's better to use more than one sources

Data Visualization

Data visualization is a process of converting the data into graphs or charts or any other types of visualization forms for better understanding the data. When designing a UI for the mobile application limitation of flutter should be kept in mind as it is a new technology to the world and it doesn't have a large packages platform like JavaScript. So, UI should be developed in a minimalist way and also should show all the data the user requires for that better to use some Bar graphs which are easy to understand for even a child so using the bar graph can convey information fast and also they are best showing values which are independent to each other as states. Below bar graph is an example of bar graphs for showing value.

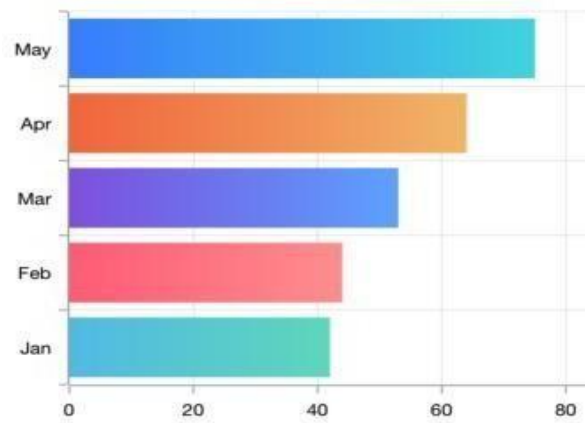
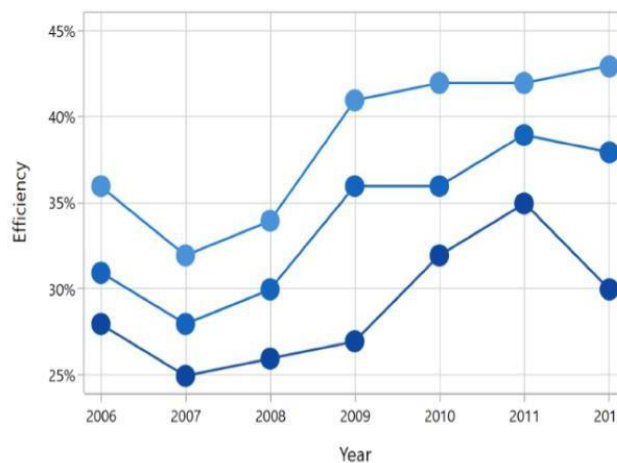


Fig 4.2: Bar Graph

Line graphs can also be used as date-time series is needed for showing the history of the past 7 or 30 days as the consumer wishes. It's higher to use a line graph than a bar graph as values are dependent on the day past's values. The beneath picture shows the example of line graphs of Syncfusion

Fig 4.3:Line Graph



A pie graph can also be used to expose the percentage of recovered, active, and loss of life instances inside the general confirmed instances throughout India which makes the consumer recognize the values more without problems. It's better to use a pie graph as values recovered, active, and death depend upon the confirmed cases as they are a part of it. The beneath photograph demonstrates the usefulness of the pie graph.

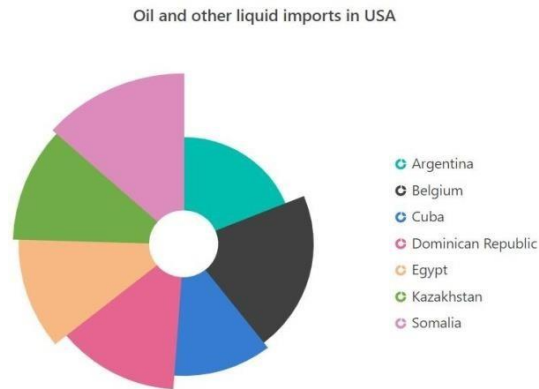


Fig 4.4: Pie Graph

The above graphs may not be sufficient to make the consumer recognize the data that become gathered so for that first-rate to apply shape files that may be effortlessly found around the internet and the usage of the one's shape files statistics can display within the form coloring like from light red to darkish crimson which symbolizes the matter of the cases from low to excessive. The under photo is a world shape file that can be used for representing the count values. The below show the world map developed using the syncfusion.



Fig 4.5: World Map

For the Indian cases, an India shape file showing confirmed instances depends on the shape of colors.

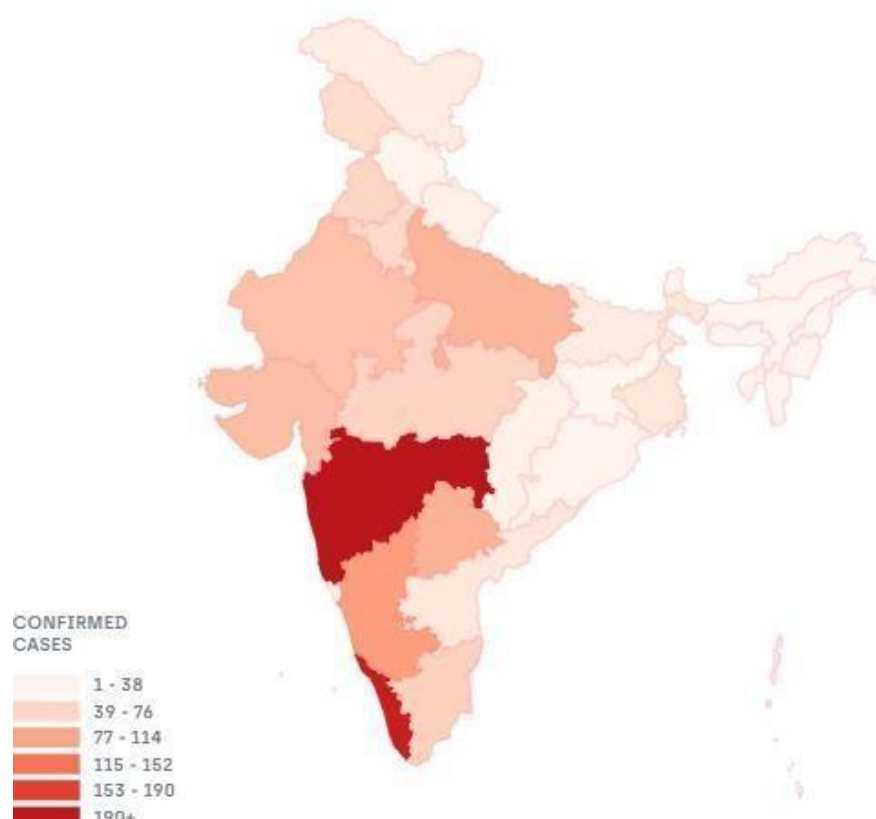


Fig 4.6: India Map

For more accurate and case number the confirmed, active, recovered, and deaths data can be shown in the table format for easy understanding and representation and representing the in descending order helps the user to monitor data easily.

	► FY 2015	► FY 2016	► FY 2017	► FY 2018	Grand Total
▼ France	\$19,097,074	\$19,575,093	\$18,251,898	\$5,553,762	\$62,477,826
Bottles and Cages	\$28,020	\$29,834	\$28,399	\$4,192	\$90,444
Cleaners	\$13,738	\$13,282	\$13,738	\$3,282	\$48,412
Fenders	\$45,640	\$45,640	\$45,640	\$11,640	\$139,809
Gloves	\$23,532	\$23,532	\$23,532	\$5,063	\$72,221
Helmets	\$54,174	\$50,947	\$53,739	\$9,418	\$168,278
Hydration Packs	\$113,151	\$107,698	\$104,335	\$27,350	\$352,534
Jerseys	\$90,561	\$98,283	\$118,608	\$33,650	\$341,103
Mountain Bikes	\$6,880,266	\$6,769,705	\$6,459,305	\$1,919,701	\$22,028,977
Road Bikes	\$6,258,897	\$5,922,311	\$5,605,662	\$1,742,914	\$19,529,784
Shorts	\$78,679	\$49,805	\$57,933	\$13,573	\$199,990
Tires and Tubes	\$66,513	\$64,508	\$77,030	\$10,839	\$218,890
Touring Bikes	\$5,111,308	\$6,207,462	\$5,373,244	\$1,691,031	\$18,383,045
Vests	\$332,911	\$199,586	\$290,735	\$81,109	\$904,341
► Germany	\$16,903,257	\$18,081,139	\$18,479,733	\$5,042,868	\$58,506,998
► United Kingdom	\$18,197,943	\$15,422,057	\$17,740,233	\$5,236,608	\$56,596,840

Fig 4.7: Table

CHAPTER 5

RESULTS AND DISCUSSION

Once the app is launched splash screen is displayed which is around for 5 seconds while this time the app collects the data required for the app and may not acquire all the data due to network issues or speed. So, Even after the splash screen continuous to collect the data and updates itself.

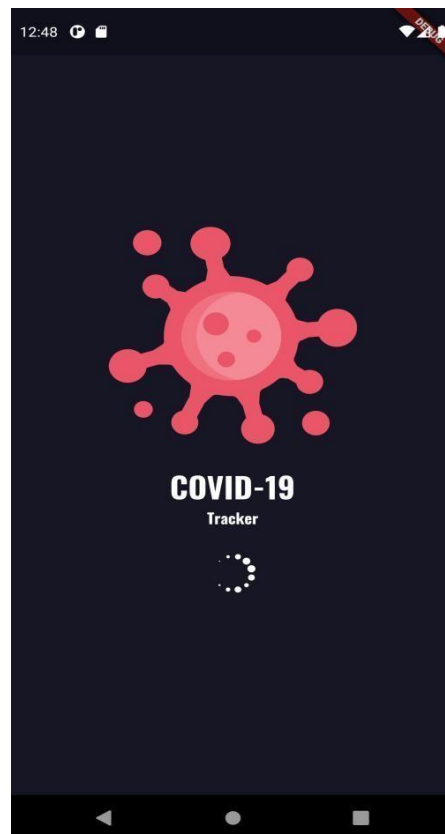


Fig 5.1: Splash Screen

After the splash screen is loaded it will redirect to the Home page which contains the current confirmed, recovered, active and death cases in India and also a pie chart showing parts of recovered, active, and death cases in the Confirmed cases.

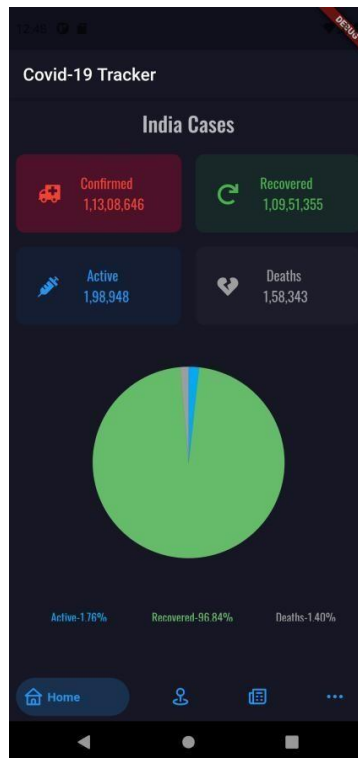


Fig 5.2: Home Page

From Home page user can navigate between any pages like state page which contains a India map coloured according the confirmed cases in the state.

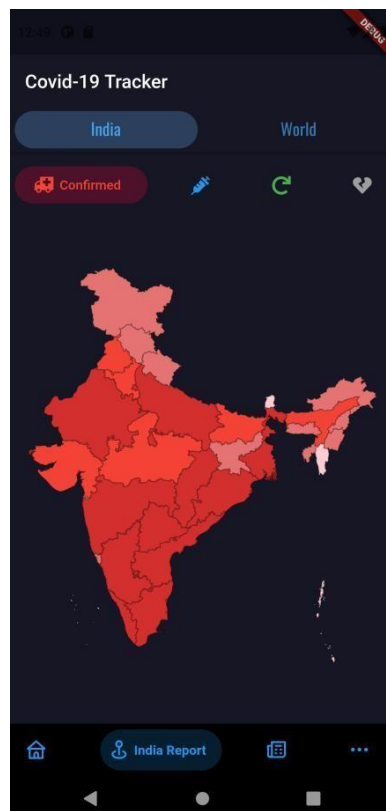


Fig 5.3 State Page

Below the India map user can find two buttons One is for daily report button when the user clicks on its an alert box will be displayed and asks user to select the options of past 1 week or 1month reports.when the user selects any one option a line chart will displayed with time range on X-axis and values on Y-axis.

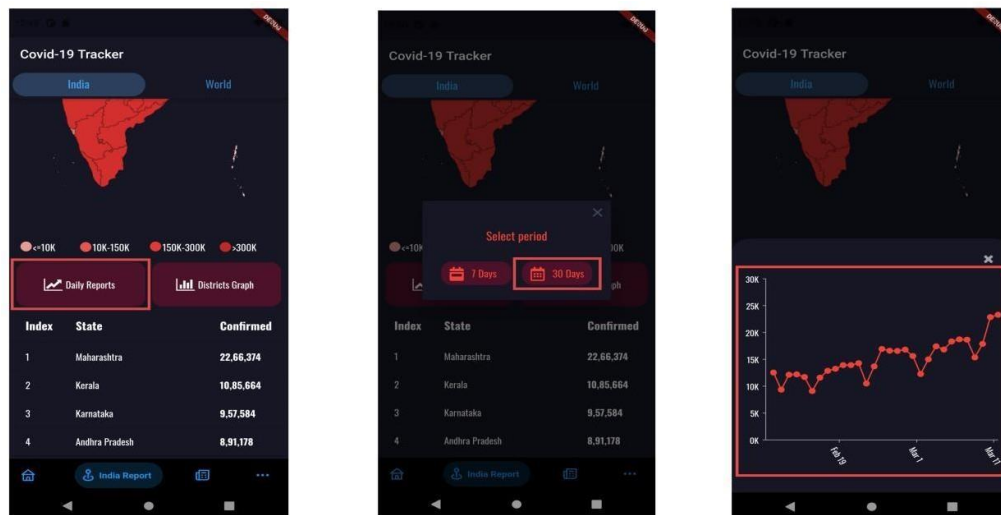


Fig 5.4: Daily Reports

Another button is State button when user the user clicks on this button a bar graph will be shown at the bottom of the screen which are states values of the category the user selected in the bar graph.

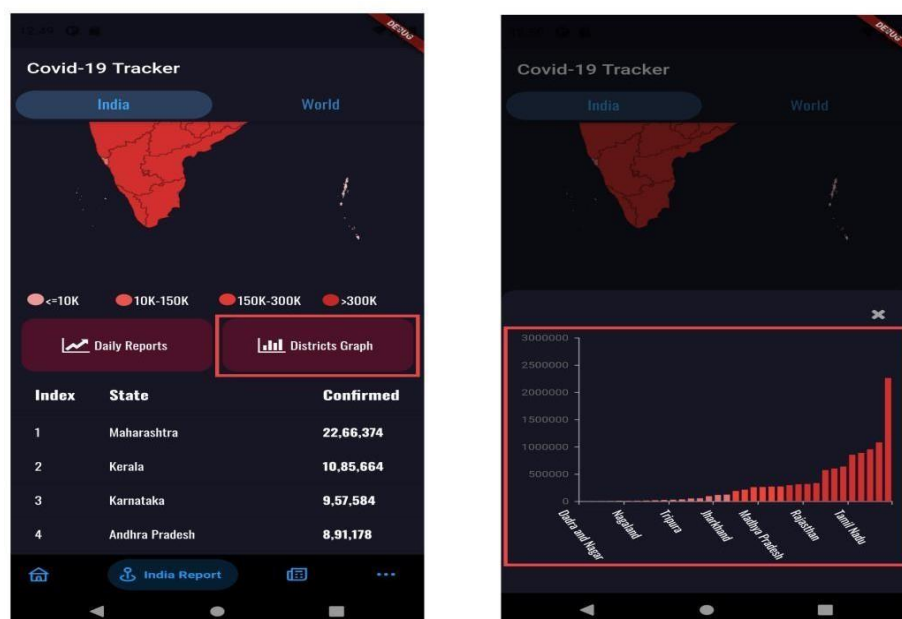
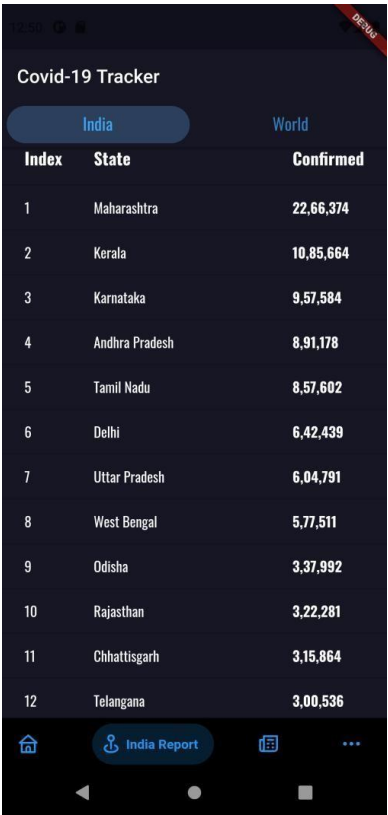


Fig 5.5: State Graph

Below the Buttons the user can find a table containing the values of the category user selected along with the state names and its latest values.



Covid-19 Tracker		
India		World
Index	State	Confirmed
1	Maharashtra	22,66,374
2	Kerala	10,85,664
3	Karnataka	9,57,584
4	Andhra Pradesh	8,91,178
5	Tamil Nadu	8,57,602
6	Delhi	6,42,439
7	Uttar Pradesh	6,04,791
8	West Bengal	5,77,511
9	Odisha	3,37,992
10	Rajasthan	3,22,281
11	Chhattisgarh	3,15,864
12	Telangana	3,00,536

Fig 5.6: State Table

For navigating between the categories a nav bar is kept at the starting of the page on clicking on the icons the user can navigate between the categories.

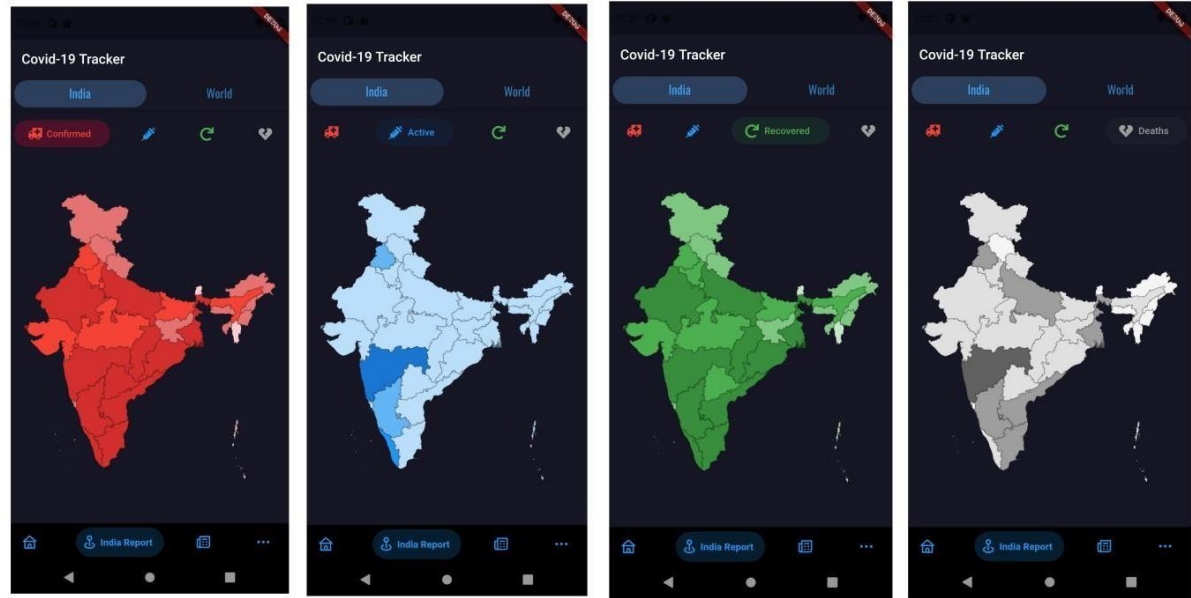


Fig 5.7 Categories Pages

If the users wants the district cases they can just click on the state of the India map and user will be navigated to the district page this page contains the similar UI as the State page with two buttons and a table for exact values.



Fig 5.8 Distrit Page

As teh state page user can click on either dialy reports or ditrsict graph and data will be displayed

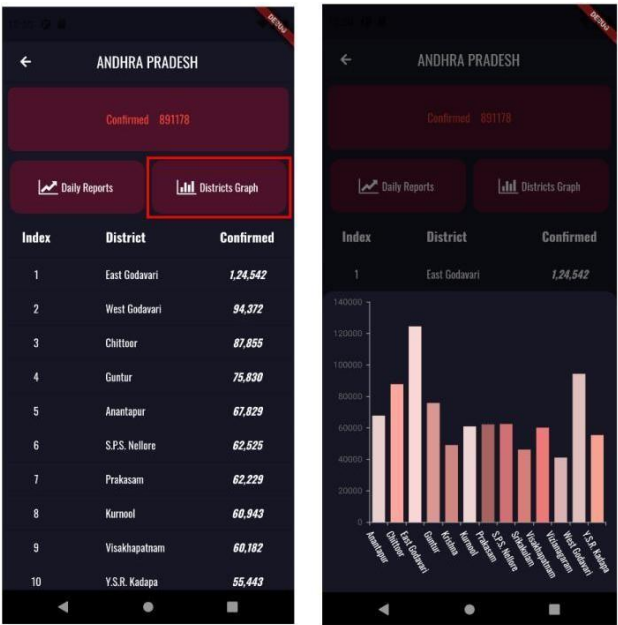


Fig 5.9 District graph

For the world map click on the world at the top of the page, User will be navigated to the world page.

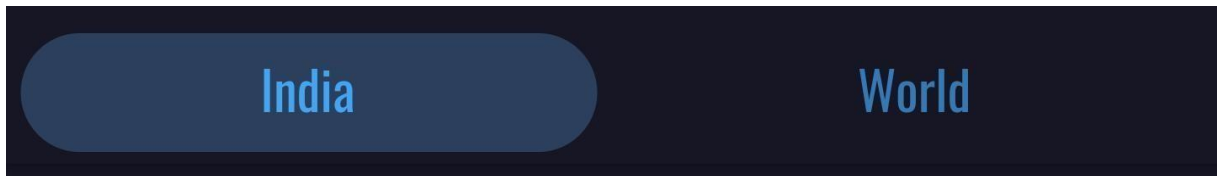


Fig 5.10 World page navigator

This page has the similar ui has the state page except its doesn't have any butons or any graphs. This page only contains world map with colors and table conatining country names and their values.

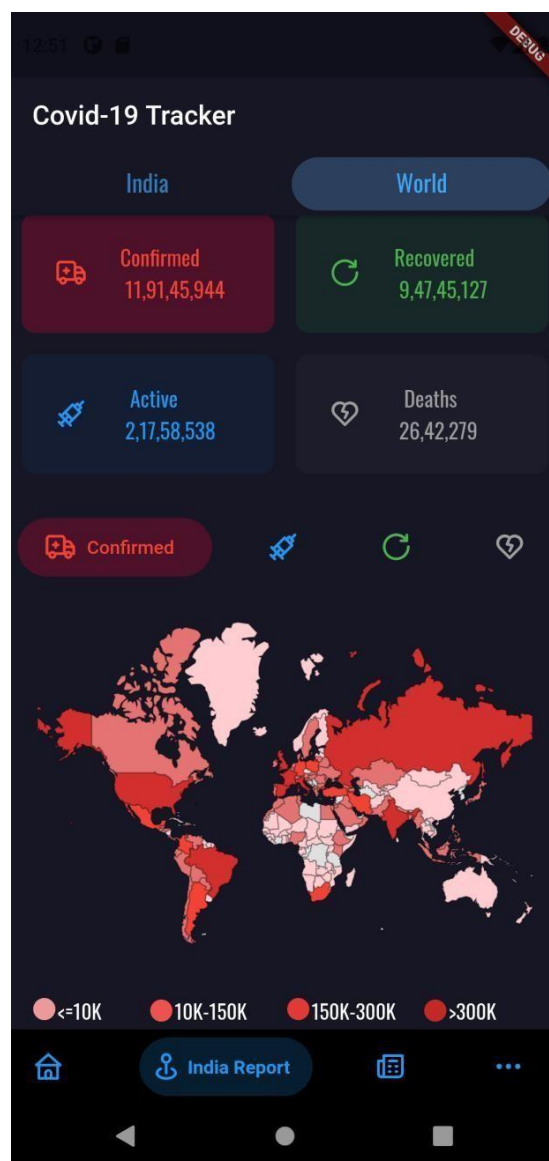


Fig 5.11 World page

News page has all the latest news related to the covid-19 user can see the news and if he/sh wants more information they can click on any one. User will be redirected to official news URL in a web-view which is a part of the Application.

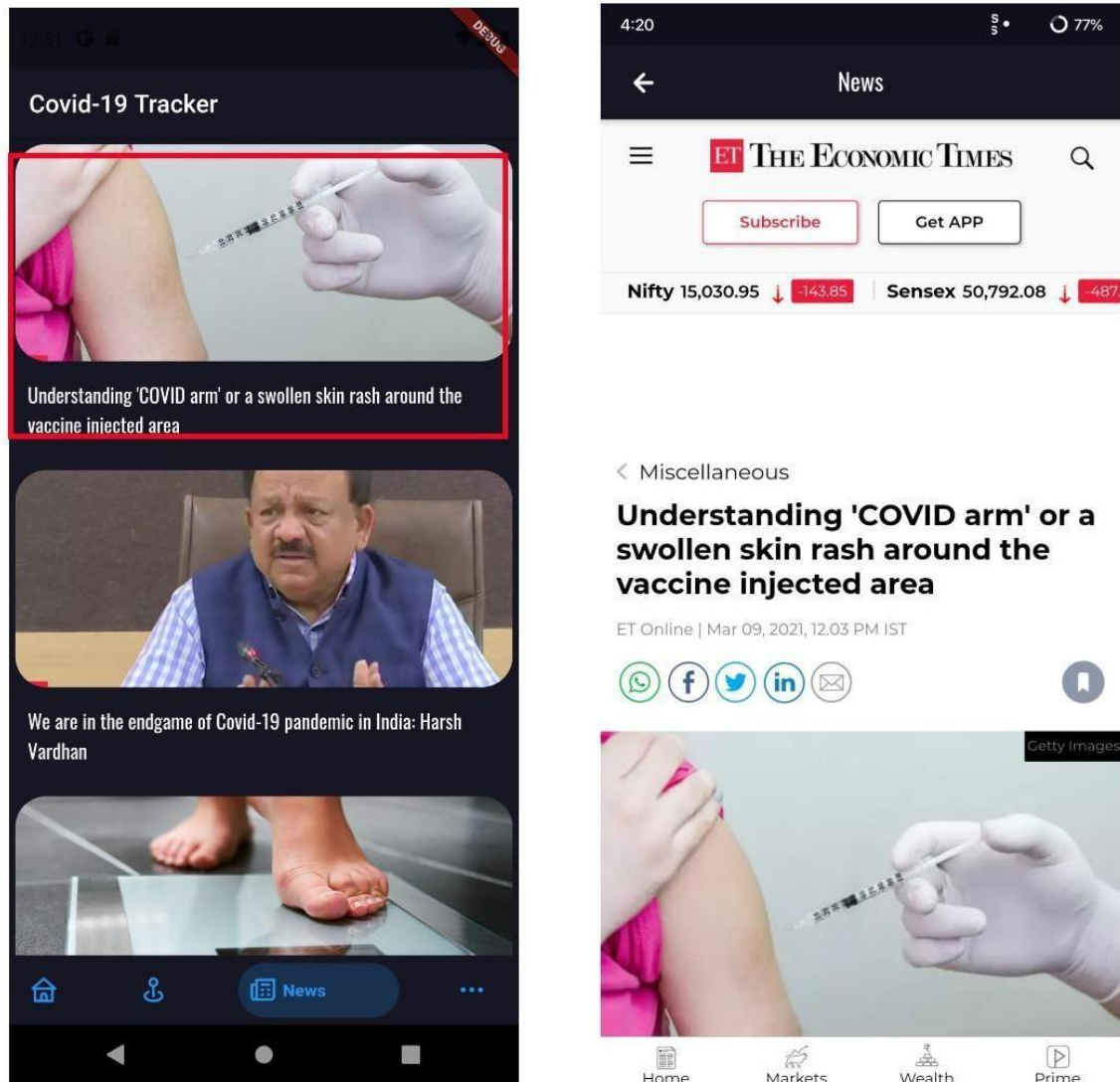


Fig 5.12: News page

There's also another page which is Others page which contains information about the COVID-19 along with its symptoms and its prevention.

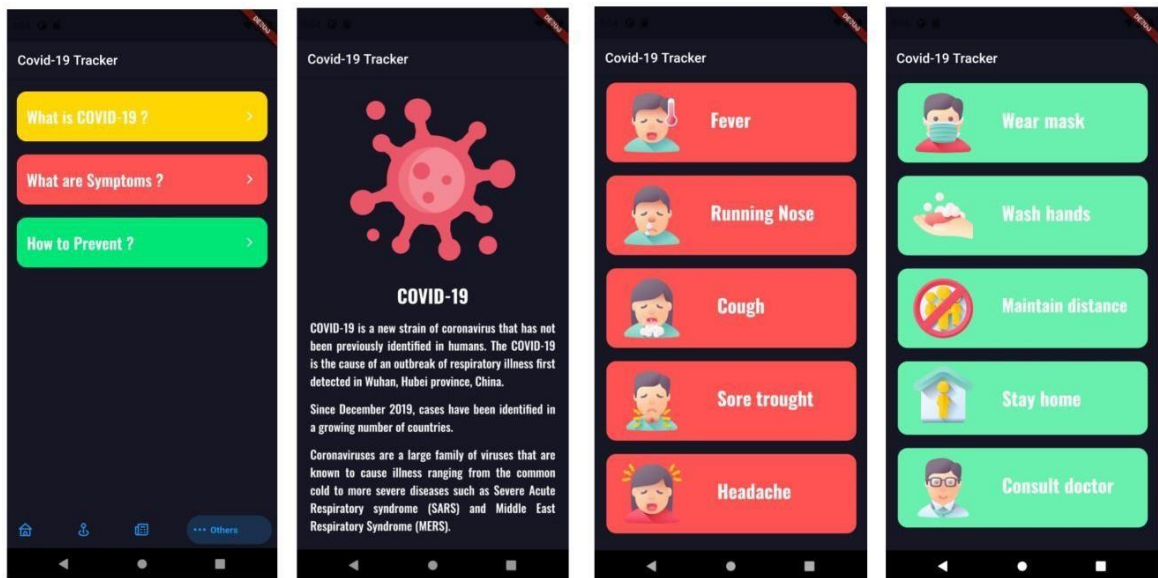


Fig 5.13: Other page

CHAPTER 5

CONCLUSION AND FUTURE WORK

CONCLUSION

COVID-19 is spreading faster and more deadly than ever before which makes the world a more dangerous place to live as there are no proper vaccines available, it's not recommended to use them, and also following rules like maintaining distance, wearing a mask, sanitizing the hands time to time, etc can prevent the people from being infected by the deadly disease. One of the ways to control people from breaking the rules and doing whatever they want is by showing them the current situation of the deadly disease around the world which might help the people understand the situation and follow the rules for them and also other people.

FUTURE WORK

In the App might contain the Following Features.

- All the case data around the world.
- Better UI and UX experience.
- Prediction model for predicting cases.
- Notification when some one near is affected by the virus.

REFERENCES

- Patel A, Jernigan DB. Initial Public Health Response and Interim Clinical Guidance for the 2019 Novel Coronavirus Outbreak — United States, December 31, 2019–February 4, 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69:140–146. <http://dx.doi.org/10.15585/mmwr.mm6905e1>
- Cucinotta, D., & Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic. *Acta Biomed*, 91(1), 157-160. <https://doi.org/10.23750/abm.v91i1.9397>
- Centers for Disease Control and Prevention. (2020). CDC Methods for the Establishment and Management of Public Health Rapid Response Teams for Disease Outbreaks. Atlanta: Centers for Disease Control and Prevention. <https://www.cdc.gov/globalhealth/healthprotection/errb/pdf/RRTManagementGuidance-508.pdf>
- Greiner AL, Stehling-Ariza T, Bugli D, Hoffman A, Giese C, Moorhouse L, Neatherlin JC, Shahpar C. Challenges in Public Health Rapid Response Team Management. *Health Security*. Jan 2020.S-8-S-13. <http://doi.org/10.1089/hs.2019.0060>
- Hellewell, J., Abbott, S., Gimma, A., Bosse, N., Jarvis, C., & Russell, T. et al. (2020). Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. *The Lancet*, 8(4), 488-496. [https://doi.org/10.1016/S2214-109X\(20\)30074-7](https://doi.org/10.1016/S2214-109X(20)30074-7)
- World Health Organization. (2020). COVID-19 Strategy Update. Geneva: WHO. Retrieved 11 May 2020, from <https://www.who.int/publications-detail/covid-19-strategy-update—14-april-2020>
- World Health Organization. (2020). COVID-19: Operational Planning Guidelines and COVID-19 Partners Platform to support country

preparedness and response. Retrieved 28 April 2020, from <https://openwho.org/courses/UNCT-COVID19-preparedness-and-response-EN>

- Centers for Disease Control and Prevention. (2020). COVID-19 72- hour Response Plan Checklist. Atlanta: CDC. <https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/index.html>
- Centers for Disease Control and Prevention. (2020). COVID-19 Groups at Higher Risk for Severe Illness. Retrieved 11 May 2020, from <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>.
- Anderson, R., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?. The Lancet, 395(10228), 931-934. [https://doi.org/10.1016/s0140-6736\(20\)30567-5](https://doi.org/10.1016/s0140-6736(20)30567-5)
- Centers for Disease Control and Prevention. (2020). COVID-19 Reducing Stigma. Retrieved 11 May 2020, from https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/reducing-stigma.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fsymptoms-testing%2Freducing-stigma.html#t1.

APPENDIX

A. PLAGIARISM REPORT

Don't Worry! This report is 100% safe & secure, its not available publically and its not accessible for search engines (Google, Yahoo, Bing, etc)

claims thousands of lives. Due to the COVID-19 spread in 212 countries and territories and the increase in the number of infected cases and the death toll in 11,07,49,023 and 24,55,131 (as of 22 February 2021), it remains a real threat to the public health system. On 11 February 2020, the World Health Organization announced an official name for the disease that is causing the coronavirus outbreak of the 2019 novel. The new name of this disease is coronavirus disease 2019, abbreviated In COVID-19. In COVID-19, 'CO' means 'crowns', 'VI' for 'Viruses', and 'D' for the disease. Previously, this disease was defined as 'New Coronavirus 2019' or '2019-NCOV'. Coronavirus, named after the indigenous councils on its surfaces, is a large family of common viruses in people and many types of animals, including camels, cattle, cats, and bats. There are many types of human coronaviruses, some of which often communicate with light respiratory diseases. Caliber 19 is a new disease caused by a novel (or new) coronavirus, which is not yet visible in humans. Infected Coronavirus rarely infected people and distributed among people. All three viruses have their origin in fleeting mice. W. Patal sequences are similar to the fact that China has initially published and offers a unique and recent unique emergency in this virus. The exact source of this virus. It was not defined. If you are trying to follow Covid-19 cases, one of the most preferred methods is based on any open source site for data collection ants and not on a source that does not contain enough data or data that is wrong. Solutions can lead to solutions. Some websites and bees that can reciprocate them are Covid19India.org (for India), the disease.sh (for the world), Covid19.who.int (for

This report is generated by [plagiarism checker tool](#)

Report Title:	Covid-19 Application Report
Report Link: (Use this link to send report to anyone)	https://www.check-plagiarism.com/plag-report/23063dfcb3912142170dc1b7dec8b4eef505f1615266660
Report Generated Date:	09 March, 2021
Total words:	2206
Total Characters:	13363
Keywords Words/Total Words Ratio:	73.54%
Any Exclude URL Used:	No exclude url was used

How much Unique

93%

how much matched

7%

B. PUBLISH PAPER

COVID-19 Tracking and Visualization App

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Abstract - Coronavirus disease 2019 (COVID-19) is because of a brand new coronavirus first identified in Wuhan, China, in December 2019. because it is a brand new virus, scientists are getting to know more every day. Although the majority who've COVID-19 have slight symptoms, COVID-19 can also cause intense infection or even demise. a few corporations, together with older adults and those who've certain underlying scientific conditions, are at accelerated risk of extreme contamination So monitoring and Visualization of COVID-19 cases and simply representing the information for a higher understanding of the COVID-19 instances around the world helps humans recognize the present-day state of affairs and to try this a cellular application is a fine way. In this article, I summarize and illustrate with examples the way to amass and Visualize the statistics of the COVID-19 cases in a cellular application using Flutter.

Technologies Used - RapidAPI, Flutter, Syncfusion, Dart.

Keywords - COVID-19, Flutter, Tracking, Visualization, Data gathering, Data Manipulation, Data Visualization.

INTRODUCTION

The COVID-19 outbreak has put everyone in an unprecedented difficult situation that has made life around the world stop and claims thousands of lives. Due to the COVID-19 spread in 212 countries and territories and the increase in the number of infected cases and the death toll in 11,07,49,023 and 24,55,131 (as of 22 February 2021), it remains a real threat to the public health system. On 11 February 2020, the World Health Organization announced an official name for the disease that is causing the coronavirus outbreak of the 2019 novel. The new name of this disease is coronavirus disease 2019, abbreviated In COVID-19. In COVID-19, 'CO' means 'crowns', 'VT' for 'Viruses', and 'D' for the disease. Previously, this disease was defined as "New Coronavirus 2019" or "2019-NCOV". Coronavirus, named after the indigenous councils on its surfaces, is a large family of common viruses in people and many types of animals, including camels, cattle, cats, and bats. There are many types of human coronaviruses, some of which often communicate with light respiratory diseases. Caliber 19 is a new disease caused by a novel (or new) coronavirus, which is not yet visible in humans. Infected Coronavirus rarely infected people and distributed among people. All three viruses have

their origin in fleeting mice. W. Patal sequences are similar to the fact that China has initially published and offers a unique and recent unique emergency in this virus. The exact source of this virus. It was not defined. If you are trying to follow Covid-19 cases, one of the most preferred methods is based on any open source site for data collection ants and not on a source that does not contain enough data or data that is wrong. Solutions can lead to solutions. Some websites and bees that can reciprocate them are Covid19India.org (for India), the disease.sh (for the world), Covid19.who.int (for the world). For more information, you can visit the RapidAPI website and search API on COVID-19 and log in to every complimentary service.

RELATED WORK

Covid19india.org It's a non-official internet site for tracking the covid-19 instances in India, it is being maintained through a collection of dedicated volunteers who curate and verify the information coming from numerous assets. They extract the information like an affected person's courting with other sufferers to perceive local and network transmissions, travel records, and status. They're the use of nation announcements and authentic handles to update our numbers. The statistics are validated with the aid of a group of volunteers and posted into a Google sheet and an API. API is to be had for all at api.covid19india.org. They may be putting their time and assets without thinking of earning a single penny from us and the purpose for that is to think that it affects every person. nowadays it is a person else who is getting infected; tomorrow it could be us. We want to save you the spread of this virus. We want to file the records so that people with understanding can use these records to make informed choices that make this website even extra incredible.

Covid-19 Dashboard of Johns Hopkins University It's additionally a non-legitimate website which was developed to respond to this ongoing public health emergency, they developed an interactive internet-primarily based dashboard hosted by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins college, to visualize and track stated cases in real-time. The dashboard first shared publicly on January 22, illustrates the location and quantity of confirmed COVID-19 cases, deaths, and recoveries for all affected international locations. It was developed to offer researchers, the public health government, and most people a person-friendly device to track the outbreak because it unfolds. Besides, all of the facts accrued and displayed are made free to be had, initially as google sheets, now in a GitHub repository, together with the feature layers of the dashboard, which can be now blanketed in the ESRI dwelling Atlas. This is the list of the companies supporting their center's COVID-19 mapping and modeling efforts. They may be grateful for monetary help from JHU, NSF, NIAID, and NASA, Bloomberg Philanthropies, Stavros Niarchos Foundation, aid from AWS, Slack, and Github, and technical aid from Esri Living Atlas team and JHU APL.

Aarogya Setu It's a legit Android and IOS application advanced and maintained by Indian authorities. App makes use of the mobile bluetooth, GPS location and contacts so that it can gather the data of affected people near the user. The App also uses the user contacts for verifying if there are any people affected by the virus of the user contacts. This app helps the user and also the government at the same time by showing coronavirus cases to the user and to protecting the user and his/her family from the virus and also displaying total affected cases of the Virus to the

Government so that the government take measures from spreading the virus. This app functionality increases by the increase in its users.

Coronotracker.in This website was developed by some Students in Goa. They designed the website in a simple manner such that its easy to understand the cases. This website currently supports to display all coronavirus cases details of every state and district. This website include map overview for better understanding and also displays the recovered and deaths of every state and district. For more details of the state the user can click on the map for better understanding on the situation of that state. The supply in their information is from the Johns Hopkins university dataset and additionally some other assets.

Mygov.in/covid-19 Indian government has developed Aarogya setu app for latest covid-19 updates and tracking the cases and also developed a website for real time updates on the covid-19 cases for each state cases like confirmed, recovered, active and deaths cases. It also displays the latest news on pan-india lockdowns for preventing the spread of the virus across the country.

STAGES OF DEVELOPMENT

While developing a mobile application a procedure should be followed for a better understanding of the code was written and also the quality of the code for the future reuse of the code.

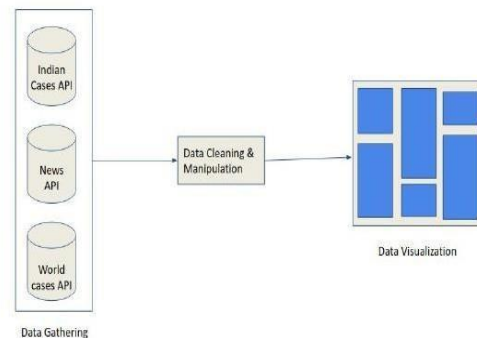


Fig 1: Architecture

1. Data Gathering

Data Gathering is a process of gathering data from a source or multiple sources. For gathering the data it's better to use the websites that were mentioned above in the Introduction. Those websites can be used as APIs and retrieve the data like covid19india.org can be used for gathering the COVID-19 cases all over India along with the states and district cases. For collecting world cases, it's better to either use covid19.com or any RapidAPI APIs free of cost and also

use covid19.who.int but it currently supports the CSV download file and doesn't support API service so it's best to go with the above API services. For Collecting news on the COVID-19 I have used an API from RapidAPI so that I can retrieve the latest news whenever the user desires. As the app is collecting a lot of data from different APIs at the same it might not collect all the data and after the splash screen, the data can't be collected in the background so for that reason collecting only the necessary data helps. So, In the main activity which is while displaying the splash screen, the app is going to collect all the data from the APIs and store them in local variables. In the main activity, the app is going to collect data like state codes, state names, state cases, news data store them locally, and share them between different pages using class arguments which is one of the easiest ways and for the world and district cases it's better to directly retrieve the data when the page is opened, as the world page has more data and if the data is retrieved in the main activity it might slow down the opening of the app so it's better to retrieve the world cases data when the user opens it and same goes to district cases as has less data it requires less time for retrieving the data so data will be collected when the user opens its.

2. Data Cleaning and Manipulation

Data cleaning is a process of removing unnecessary data or removing null data from the data retrieved and the manipulation part is to change the data such that it favors the user for easier understanding of the target. As mentioned above after data gathering categorizing the data is the best option for the future use of the data. So, data from the collection of states can be categorized into four ways.

1. Confirmed - Total Patients affected by the Virus
2. Recovered - Total Patients recovered from the Virus
3. Active - Total Patients remaining after removing the recovered and dead patients from the infected patients
4. Deaths - Total patients dead by the virus

After categorizing data will be stored in different Lists for future usability and management of data. The way of storing the data is also crucial so that it can be easily accessible so that it's better to use dictionaries as the data in it can be accessed easily.

3. Data Visualization

Data visualization is a process of converting the data into graphs or charts or any other types of visualization forms for better understanding the data. when designing a UI for the mobile application limitation of flutter should be kept in mind as it is a new technology to the world and it doesn't have a large packages platform like javascript. So, UI should be developed in a minimalist way and also should

show all the data the user requires for that better to use some Bar graphs which are easy to understand for even a child so using the bar graph can convey information fast and also they are best showing values which are independent to each other as states. Below bar graph shows the confirmed cases of every state in India till yesterday in ascending order.

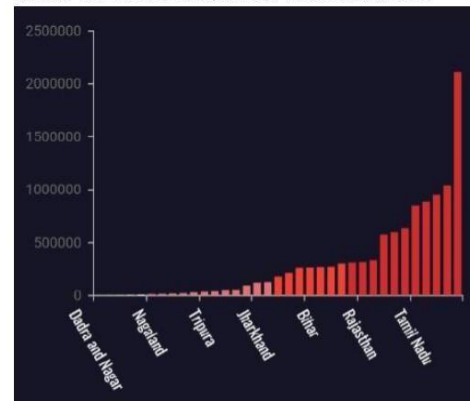


Fig 2: Bar Graph

Line graphs can also be used as date-time series is needed for showing the history of the past 7 or 30 days as the consumer wishes. It's higher to use a line graph than a bar graph as values are dependent on the day past's values. The beneath picture shows the beyond 30 days' document of shown instances in India.

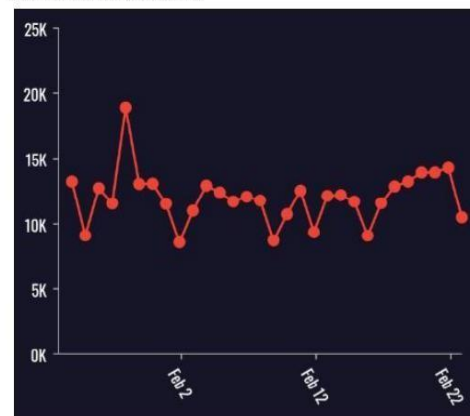


Fig 3:Line Graph

A pie graph can also be used to expose the percentage of recovered, active, and loss of life instances inside the general confirmed instances throughout India which makes the consumer recognize the values more without problems. It's better to use a pie graph as values recovered, active, and death depend upon the confirmed cases as they are a part of it. The beneath photograph indicates the proportion of recovered, lively, and demise within the shown cases in India.

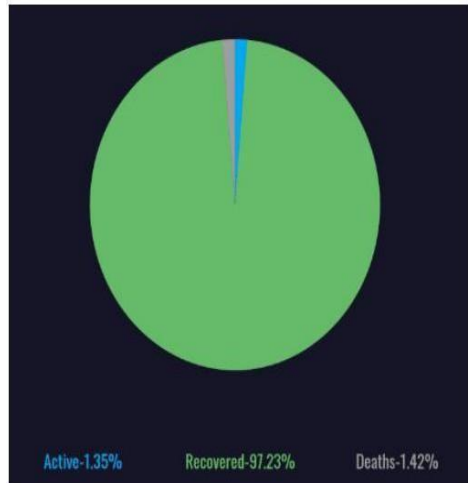


Fig 4: Pie Graph

The above graphs may not be sufficient to make the consumer recognize the data that become gathered so for that first-rate to apply shapefiles that may be effortlessly found around the internet and the usage of the one's shapefiles statistics can display within the form colorings like from light red to darkish crimson which symbolizes the matter of the cases from low to excessive. The under photo is an India shapefile showing confirmed instances depend on the shape of colors.

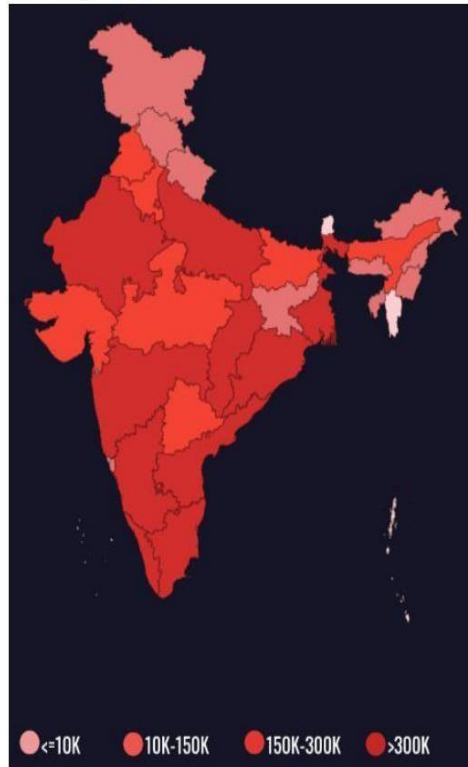


Fig 5: India Map

For the world cases, a world shapefile can be used for representing the count values. The below show the confirmed cases count in the form of colors



Fig 6: World Map

The news is a small component to which consumers may not give plenty of choice so the news page may be designed in a simple manner for that displaying the media photograph and title of the information may be sufficient for greater details the user can see the respectable information web page of the news he/she clicked. The underneath picture indicates the layout of the news web page.

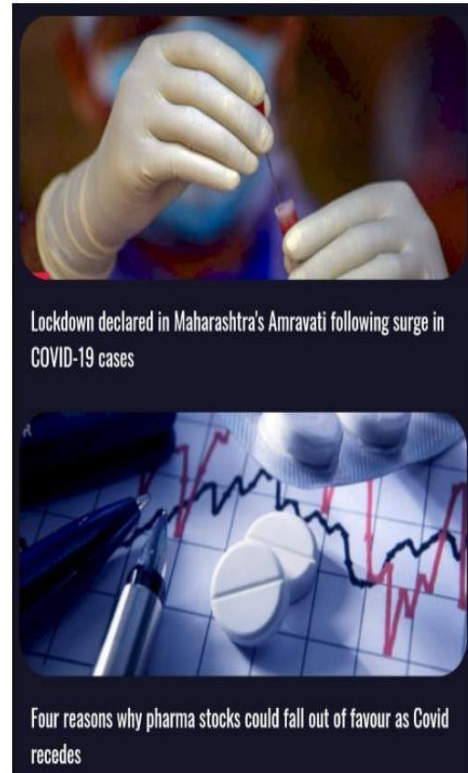


Fig 7: News Page

CONCLUSION

COVID-19 is spreading faster and more deadly than ever before which makes the world a more dangerous place to live as there are no proper vaccines available, it's not recommended to use them, and also following rules like maintaining distance, wearing a mask, sanitizing the hands time to time, etc can prevent the people from being infected by the deadly disease. One of the ways to control people from breaking the rules and doing whatever they want is by showing them the current situation of the deadly disease around the world which might help the people understand the situation and follow the rules for them and also other people.

REFERENCE

- Patel A, Jernigan DB. Initial Public Health Response and Interim Clinical Guidance for the 2019 Novel Coronavirus Outbreak — United States, December 31, 2019–February 4, 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69:140–146. <http://dx.doi.org/10.15585/mmwr.mm6905e1>
- Cucinotta, D., & Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic. *Acta Biomed*, 91(1), 157-160. <https://doi.org/10.23750/abm.v91i1.9397>
- Centers for Disease Control and Prevention. (2020). CDC Methods for the Establishment and Management of Public Health Rapid Response Teams for Disease Outbreaks. Atlanta: Centers for Disease Control and Prevention. <https://www.cdc.gov/globalhealth/healthprotection/errb/pdf/RRTManagementGuidance-508.pdf>
- Greiner AL, Stehling-Ariza T, Bugli D, Hoffman A, Giese C, Moorhouse L, Neatherlin JC, Shahpar C. Challenges in Public Health Rapid Response Team Management. *Health Security*. Jan 2020.S-8-S-13. <http://doi.org/10.1089/hs.2019.0060>
- Hellewell, J., Abbott, S., Gimma, A., Bosse, N., Jarvis, C., & Russell, T. et al. (2020). Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. *The Lancet*, 8(4), 488-496. [https://doi.org/10.1016/S2214-109X\(20\)30074-7](https://doi.org/10.1016/S2214-109X(20)30074-7)
- World Health Organization. (2020). COVID-19 Strategy Update. Geneva: WHO. Retrieved 11 May 2020, from <https://www.who.int/publications-detail/covid-19-strategy-update—14-april-2020>
- World Health Organization. (2020). COVID-19: Operational Planning Guidelines and COVID-19 Partners Platform to support country preparedness and response. Retrieved 28 April 2020, from <https://openwho.org/courses/UNCT-COVID19-preparedness-and-response-EN>
- Centers for Disease Control and Prevention. (2020). COVID-19 72-hour Response Plan Checklist. Atlanta: CDC. <https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/index.html>
- Centers for Disease Control and Prevention. (2020). COVID-19 Groups at Higher Risk for Severe Illness. Retrieved 11 May 2020, from <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/groups-at-higher-risk.html>
- Anderson, R., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?. *The Lancet*, 395(10228), 931-934. [https://doi.org/10.1016/s0140-6736\(20\)30567-5](https://doi.org/10.1016/s0140-6736(20)30567-5)
- Centers for Disease Control and Prevention. (2020). COVID-19 Reducing Stigma. Retrieved 11 May 2020, from https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/reducing-stigma.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fsymptoms-testing%2Freducing-stigma.html#t1

C. SOURCE CODE

Main.dart

```
import 'dart:async';
import 'package:flutter/material.dart';
import 'package:google_fonts/google_fonts.dart'; import
'package:http/http.dart' as http;
import 'package:ssh_app/homepage.dart'; import
'dart:convert' as convert;
import 'package:flutter_spinkit/flutter_spinkit.dart'; import
'package:ssh_app/model.dart';

void main() {
  WidgetsFlutterBinding.ensureInitialized();
  runApp(MyApp());
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(home: SplashScreen());
  }
}

class SplashScreen extends StatefulWidget { @override
  _SplashScreen createState() => _SplashScreen();
}

class _SplashScreen extends State<SplashScreen> { List<List<BarData>>
  daily = [];
  var dates = List<DateTime>.generate(
    30, (i) => DateTime.now().subtract(Duration(days: i + 1)));
  // ignore: non_constant_identifier_names var
  india_cases = [],
    state_codes = [],
    state_names = [],
    district_names = {},
    news;

  @override
```

```

void initState() {
  startTime();
  _get_news().then((jsonResponse) {
    setState() {
      this.news = jsonResponse["articles"];
    };
  });
  _get_state_details().then((jsonResponse) {
    jsonResponse["state_meta_data"].forEach((f) { var code
    = f["abbreviation"];
    var name = f["stateut"];
    if (!["TT", "UN"].contains(code) && name != 'Lakshadweep') {
      setState() {
        this.state_codes.add(code);
        this.state_names.add(name);
      };
    }
  });
  _get_district_details().then((jsonResponse) {
    jsonResponse["district_meta_data"].forEach((f) { if
    (f["state"] != 'Lakshadweep') {
      if (!this.district_names.containsKey(f["state"])) {
        this.district_names[f["state"]] = [];
      }
      setState() {
        this.district_names[f["state"]].add(f["district"]);
      };
    }
  });
  _get_daily_changes().then((jsonResponse) { var
  states = jsonResponse["states_daily"];
  List<BarData> confirmed = [], active = [], recovered = [], deaths = []; dates.forEach((d) {
  var value = (d.difference(DateTime(2020, 3, 14)).inDays) * 3;
  confirmed.add(BarData(d, int.parse(states[value]["tt"])));
  active.add(BarData(
    d, int.parse(states[value]["tt"])
    -

```

```

        int.parse(states[value + 1]["tt"]) -
        int.parse(states[value + 2]["tt"])); recovered.add(BarData(d,
int.parse(states[value + 1]["tt"])); deaths.add(BarData(d,
int.parse(states[value + 2]["tt"]));
});
this.daily.add(confirmed);
this.daily.add(active);
this.daily.add(recovered);
this.daily.add(deaths);
});
super.initState();
}

```

```

// ignore: non_constant_identifier_names
_get_news() async {
  var response = await http.get(
    "https://covid-19-
news.p.rapidapi.com/v1/covid?q=covid&lang=en&country=in&page=1&page_size=10 &media=True",
    headers: {
      "x-rapidapi-key": "API
      KEY",
      "x-rapidapi-host": "covid-19-news.p.rapidapi.com"
    });
  return convert.jsonDecode(response.body);
}

```

```

// ignore: non_constant_identifier_names
_get_daily_changes() async { var
  response =
    await http.get('https://api.covid19india.org/states_daily.json'); return
  convert.jsonDecode(response.body);
}

```

```

// ignore: non_constant_identifier_names
_get_state_details() async {
  var response = await http.get('https://api.covid19india.org/misc.json'); return
  convert.jsonDecode(response.body);
}

```

```

// ignore: non_constant_identifier_names
_get_district_details() async {
  var response = await http.get('https://api.covid19india.org/misc.json'); return
  convert.jsonDecode(response.body);
}

startTime() async {
  var duration = new Duration(seconds: 4); return
  new Timer(duration, route);
}

route() { Navigator.pushReplacement(
  context,
  MaterialPageRoute(
    builder: (context) => HomePage(
      state_codes: this.state_codes,
      state_names: this.state_names,
      district_names: this.district_names,
      india_cases: this.india_cases,
      confirmed_cases: {}, active_cases: {},
      recovered_cases: {}, deaths_cases: {},
      index: 0,
      daily: this.daily,
      news: this.news,
    ));
}

initScreen(BuildContext context) { return
  Scaffold(
    body: Center(
      child: Column(
        mainAxisAlignment: MainAxisAlignment.center,
        children: [
          Container(
            child: Image.asset("assets/icon.png"),
            padding: EdgeInsets.all(10),
            margin: EdgeInsets.all(10),

```

```

        width: 250,
        height: 250,
      ),
      Container(
        child: Text(
          "COVID-19",
          style: GoogleFonts.oswald(
            fontSize: 30, fontWeight: FontWeight.bold, color: Colors.white),
        ),
      ),
      Container(
        child: Text("Tracker\n",
          style: GoogleFonts.oswald(
            fontSize: 15,
            fontWeight: FontWeight.bold, color:
              Colors.white))),
      Container(
        child: SpinKitCircle( color:
          Colors.white,
          duration: Duration(milliseconds: 800),
        ))
    ],
  )),
);
}

@override
Widget build(BuildContext context) { return
  MaterialApp(
    theme: ThemeData(scaffoldBackgroundColor: Color.fromRGBO(22, 22, 37, 1)), home:
    initScreen(context),
  );
}
}

```