



Covid Live Tracker Android App Development with Flutter

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Abstract: In this growing age of the Technology, every hand has smartphone or another device. A study shows that number of smartphone users in India was estimated to reach over 760 million in 2021, with the number of smartphone users worldwide forecasted to exceed to 3.8 billion users in 2021. Many Development process of software also increased. Due to lot of availability of different devices there is need to develop a single source code programming language or SDK which covers all aspects of all different devices for application development. Keeping all this in mind Google have developed a software Develop Tool kit called Flutter which is a cross-platform application development toolkit. Flutter is an open-source SDK for developing high-performance and more reliable mobile applications for operating systems like iOS and Android. AOT compilation (Ahead-of-time compilation) compiles a high-level programming language such as C or C++, or an intermediary representation such as Java bytecode or .NET Framework Common Intermediate Language (CIL) code, into native system-dependent machine code so that the subsequent binary file can execute natively. During Experimenting and debugging process it provides hot reload. This feature is unique in Flutter. Hot reload works by inserting updated source code files into the running Dart Virtual Machine (VM). After the VM updates classes with the new versions of fields and functions, the Flutter framework automatically reconstructs the widget tree, permitting you to rapidly view the special effects of your changes.

Keywords: Android, iOS, Flutter, Dart, Cross-Platform Mobile application development, SDK

I. INTRODUCTION

Application development is increasing rapidly during some of years. Research on faster and compatible advance software also increasing development process in technology. Developers use React framework extensively because of its non-complex and easy nature. Further, Google announced another mobile SDK named Flutter in the latter half of 2016. Inspired by React Native, Flutter application can also run equally on both platform android and iOS. Stateful hot reload leads to high developer velocity. Flutter offers an instant UI update when changes are made to the code. This is possible thanks to the just-in-time compiler. The Dart language supports just-in-time (JIT) and ahead-of-time (AOT) compilation. JIT facilitates hot reloads — as the app code is compiled while running immediately, a change is made. AOT compilation handles the compilation of code to the native ARM machine code, which makes Flutter extremely fast. Flutter 2.0.6 now has a stable support for the web and beta for desktop. Flutter developers can now build not just for mobile, but also the web with a single codebase. Flutter is a game-changer in the cross-platform application development world. Its architecture is based on the prominent reactive programming. It Reduces code development time. It has Flexible UIs Flutter is ideal to obtain while building a minimum viable product (MVP) for businesses as it fastens up the development process and amplifies a striking UI design layout. Flutter uses Skia for rendering onto a platform-provided canvas. With the built-in engine of flutter, UI created is launched on virtually any platform. Some ingenious apps that are built by using Flutter framework, as follows-Google Ads, Xianyu by Alibaba, Reflectly, Hamilton, Watermaniac, PostMuse, SpaceX G.

II. FLUTTER

Flutter is an open-source UI software development kit created by Google at 2016. It is a toolkit for crafting beautiful, natively compiled applications for android, iOS, web, and desktop from a single codebase. The goal of flutter is to provide developers a framework which can deliver high performance app that feels natural on distinct platforms. On December 2018, Google released the first version of Flutter, Flutter 1.0 Popularity – Flutter's popularity can be estimated by the fact that it is still not in its stable release but has already been adopted by some of the most famous companies such as Alibaba, Google Ads, Birch Finance, App Tree, Hamilton Musical and many more. And since more and more companies are adopting flutter, it has seen a rise in the job market as well. React Native, are now tingling with flutter. Few of the important points and facts about flutter are:



- a. It is all Widget! - Everything in Flutter is a widget. Even the app itself is a complete widget. The layouts are widgets, the typography is a widget, colour is a widget, button is a widget.
- b. Flutter is not a language, it is an SDK. The official language for flutter is Dart.
- c. A bigger APK size – The application made in flutter has 50-60% bigger size as compared to its counterparts.
- d. Flutter runs in the Dart virtual machine which features a just-in-time execution engine. While writing and debugging an app, Flutter uses Just in Time compilation, allowing for "hot reload", with which modifications to source files can be injected into a running application.

III. DART

Dart is a programming language developed by Google and was first unveiled in October 2011. The project was founded by Lars Bark and Kasper Lund. Dart 1.0 was released on November 2013. Its stable release is 2.12.0 Dart is an easy to learn language and seems like a combination of java, python, and C. Nevertheless, it has features which even the aforementioned languages didn't have. Few of the key features of Dart include: a. Optimised for UI – The language contains efficient async-await features for user interfaces. It has features like collection if for customising UI for each platform. b. Productive Development – The Hot Reload function of Dart eases the iterative changing of source code. This is a feature that lacked in many other app development platforms and the developer had to spend a good amount of time in waiting for the code to upload. c. Fast on platforms – The backend code for supporting an app can be done in this language which will run on all platforms.

IV. NEED OF THE PROPOSED SYSTEM

The Whole world is facing Global covid surge, in this situation how to keep track the record of covid patient on real time at one place. Data is available but not is accurate and not an official data. Develop a flexible UI. How to analyse cases with previous data. Need of a system to get data on real time, so there is need of such system which provide the solution. Application using flutter is a good objective for future adaptability.

V. SYSTEM OVERVIEW

In this age of advance technology, a system can be developed with the help of some programming language to keep track of number of patients of covid. Instead of using the web implementation, here we have used software implementation. current Situation of COVID-19 shows the pandemic situation. Preparing the software may help to keep track of the situation to the whole world. The system contains a flutter-based application which have basically two main widgets one for showing global result and second one for country wide result of covid cases. Global section is also a main navigator after launching the app.

VI. PROPOSED SYSTEM

This section describes about the proposed system which tells about an application which shows real time data about current number of COVID-19 cases globally and country wise. It works on real time data. Technically it has made from a dart programming language (some plugins have been used) and flutter SDK.

Covid live tracker app run on specified API which connects on real time and data provided by an API of a website. It includes awesome features which tell number of live cases globally or region wise.

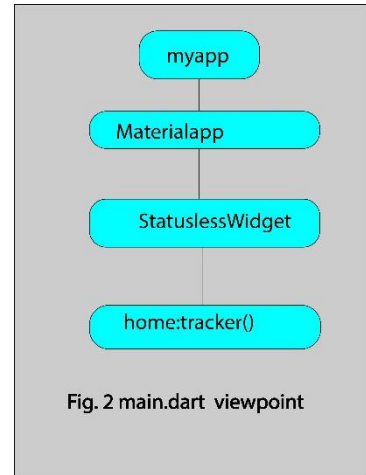
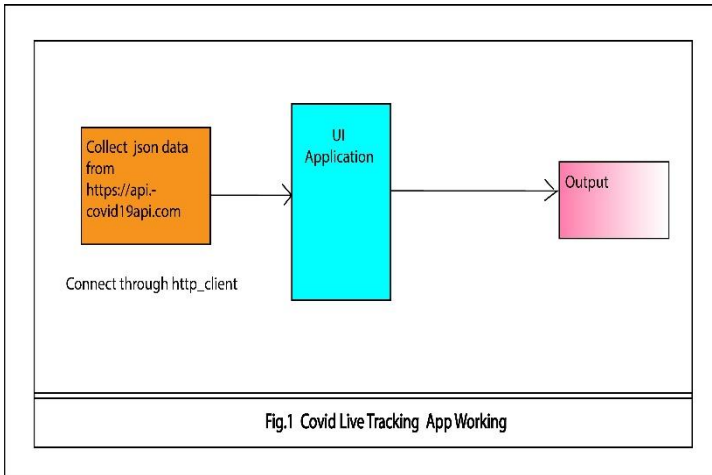
Features:

- It displays current covid situation like total number of covid cases, recovered, Active cases and number of deaths due to covid Globally and Country-wise entered by user.
- Attractive UI.
- Very convenient.
- Works on real time data.
- It does not contain malware.
- Adaptability of future-ready.

This application interface provides a good user interface about covid tracking app. Its working can be defined a redirected data source (decoding from json data) which provides real time tracking.

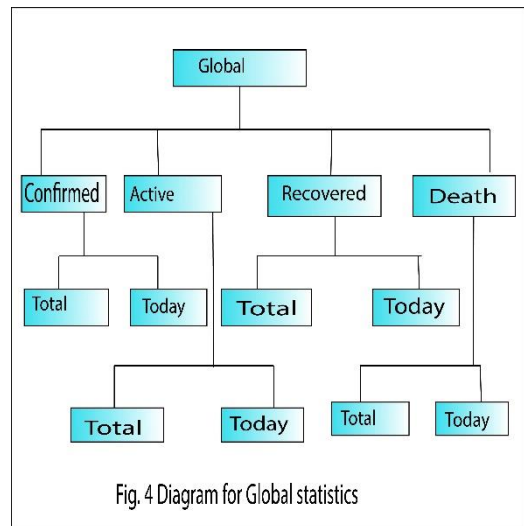
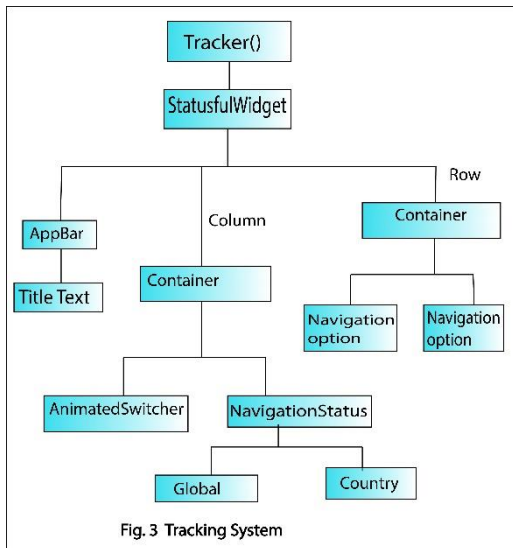


Fig. 1 shows complete scenario for UI application



This application mainly Contains following sections: -

- A. Main Application (main.dart)
- B. Tracker
- C. Global
- D. Country
- E. Covid live data



A. MAIN APPLICATION: -

This part contains myapp class that extends StatelessWidget. Basic diagram is as follow that shows the main.dart, it returns MaterialApp that contains home page. Fig. 2.

B. TRACKER: -

This section describes about tracker, it contains scaffold (a class in flutter that contains many useful widgets like AppBar, bottom navigation bar etc. Fig. 3 shows clearly about column and row widget, child widget. Container includes some child widget. further it has two navigation Global and Country.

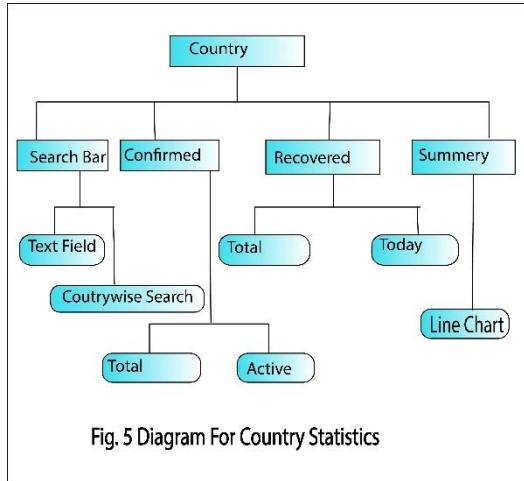


Fig. 5 Diagram For Country Statistics

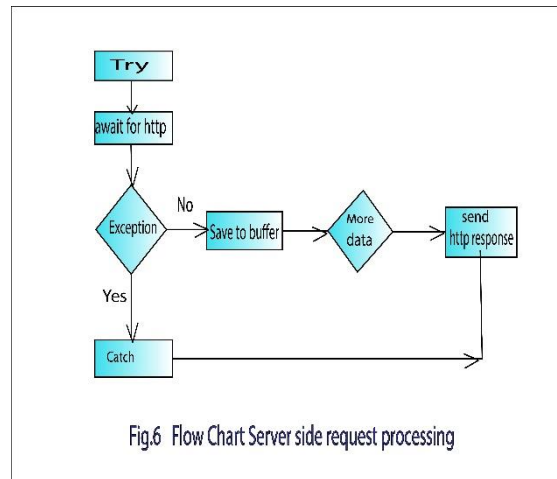


Fig.6 Flow Chart Server side request processing

C. GLOBAL: -

This section is the part of navigation using animated switcher we can change navigation option and can float to Global or country. It also contains many widgets like row and column. it has 4 part Confirmed, Active, Recovered and Deaths. All these contains two section. And it contains sub child Total and Today which contains text field and data field (which is decoded from json).

D. COUNTRY: -

This section includes a types of structure or widgets followed by fig.5. It provides data which is country specific. It provides summery via chart analysis from previous data. Sample chart is displayed in Fig.7.

Appendices: -

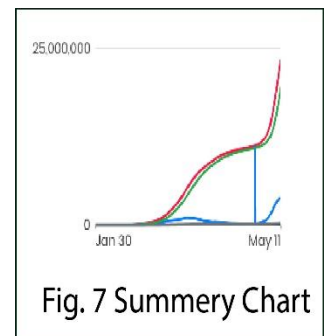
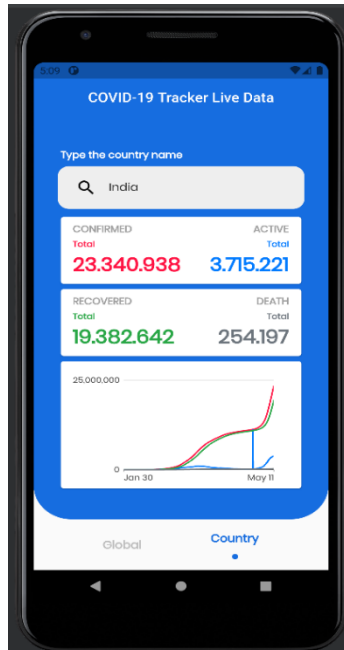
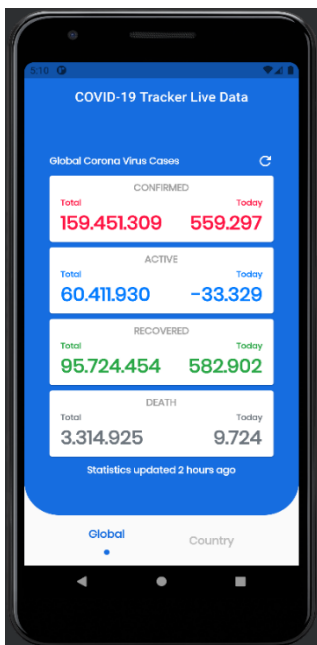


Fig. 7 Summary Chart



E. COVID SERVICE DATA: -

Now question comes in mind where the data actually comes from? Answer is very simple it comes from json data source <http://api.covid19api.com> in the form of json data. `await http_client` is used in flutter to establish connection. Where it decodes data from json data and provides result. Following is the source code for sever side request processing. Refer to Fig 6.

VII. CONCLUSION

This developed application displays Global COVID situation and country-wise situation about cases, active cases, recovered and number of deaths. This may help to analyse the data about covid spread behaviour and gives an overview about the situation. All the data provided by this app is in million.

Finally, an application has been developed which provides to service to both platform android and iOS. This unique quality makes flutter SDK acceptable for future application building. Flutter also works on web-browser.

Flutter is getting more popularity day by day. The line to drawn when to choose Flutter over two separate native builds, can be chosen at the development of smaller to medium applications which are more flexible. Considering that Flutter's strong side is being a cross-platform solution, Flutter still performs well on a single application base if compared to native applications. According to research published on IJRCT [5] it's run time CPU performance is also comparatively good.

VIII. FUTURE SCOPE

This project further can be implemented by adding following features: -

In future, Application build on this project may contain some different features like-

- I. Adding widgets for login/ activity to provide good user experience.
- II. Enabling Location based services may provide seamless experience
- III. In future, app can be upgraded by adding features like vaccination data (number of people got vaccinated) on the basis of different geographic region

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