Covid Companion

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Abstract— The outbreak of Coronavirus disease (COVID-19), caused by severe acute respiratory syndrome (SARS) coronavirus 2 (SARS-CoV-2), has thus far killed over 1,30,000 people and infected over 56,000,000 in the world, resulting in catastrophe for humans. In retort to the swiftly growing cases of COVID-19 affected people and misperception among everyone, we have decided to make such a submission that delivers all the essential resources that might need in such challenging times. This application provides all the necessary information and assembles all the different needs under a single platform.

Keywords: COVID-19; Android Application, Live Stats, APIs

I. INTRODUCTION

Coronaviruses are a group of related RNA viruses that cause sicknesses in beings and birds. In humans and birds, they cause respiratory tract contaminations that can range from mild to fatal. Minor illnesses in human beings comprise cases of the common cold (which is also caused by other viruses), while more lethal diversities can cause other infections like SARS and COVID-19. In cows and pigs, they cause looseness, while in rats they cause hepatitis and encephalomyelitis. There are as yet no inoculations or antiviral drugs to avert or treat human coronavirus infections.

Maximum people diseased with the COVID-19 virus will experience minor to reasonable breathing disorder and recover without requiring distinct treatment. Grown-up individuals and those with underlying medical complications like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illnesses. The finest means to avert and slow down transmission is to be well knowledgeable about the COVID-19 virus, the sickness it causes, and how it blowouts. Shield yourself and others from infection by cleaning your hands on a regular basis or using an alcohol-based hand sanitizer frequently and always avoid touching your face. The COVID-19 germ suppers principally through droplets of spittle or ejection from the muzzle when an disease-ridden person coughs or sneezes, so it's significant that you also practice breathing protocol (for example, by coughing into a arched elbow).

In the current scenario, there is a lot of confusion among people related to COVID-19 such as fake news, symptoms, precaution measures, etc. And in the quarantine stage, people are locked in their houses and they need medical and food essentials. But due to the critical situation, risking one's health by going out to the public markets and crowded places is harmful and depressing also. So, taking an account of all such serious problems, we created an Android Application named: "COVID-19 Companion", which solves all the current problems and paves as a reliable partner in such difficult times.

Features this app provides are live statistics of Deaths, Positive and recovered cases according to the states in India. Locates nearby Hospitals, Grocery Stores, and Medical Stores using user's location data. Daily updated News regarding coronavirus, E-shopping feature to buy Disinfectants, masks, Sanitizers, etc. Also provides the necessary guidelines circulated by the Government of India and a list of Covid specialty hospitals and Helpline numbers according to the states. We have also provided features where you can book your Covid test from our app only. We have made use of the Flutter framework which is open-sourced by Google and made in Dart language which we will be discussing now.

II. LITERATURE REVIEW

COVID-19 pandemic has overtaken the entire world and it has affected people globally, not only in the medical industry but in every aspect. There is a lot of fear, confusion, and myths regarding COVID among people. There is no proper platform from where people can get correct information about the COVID Facts, Specialized Hospitals, News, COVID Test Booking, Statewise Emergency Number and Hospitals Address, etc. People are in lockdown situation in their homes, but they need medical and daily essentials, our application tells them their nearby essentials locations and phone numbers. After careful review of all the platforms, we decided to make one Super-App for the people to help them in such difficult times to get all the information under one platform. They can access the Live COVID Stats, True News, Daily Essentials, Book Test, Donate Securely in the one-single platform. That's where our application is a handy tool. It's their all-in-one companion for all their needs at this time.

III. TECHNOLOGIES

This Application is created in Flutter and uses different technologies to facilitate its functions correctly. This application's back-end services are backed by the Firebase platform and for storing the data, it uses cloud data storage services. Here, a detailed guide regarding technologies is provided

A. Flutter

– Flutter is a cross-platform UI toolkit that is planned to allow code reusability crossways operating systems such as iOS and Android, while also permitting applications to interface unswervingly with the fundamental platform. The main aim is to allow developers to deliver high-performance applications that feel accepted on various kinds of platforms, embracing differences where they occur while sharing as much code as possible.

– During development, Flutter apps run in a VM that offers a stateful hot reload of changes without needing a full recompile. For release, Flutter apps are compiled directly to machine code, whether Intel x64 or ARM instructions

or to JavaScript if targeting the web. The framework is open-source, with a permissive BSD license, and has a thriving ecosystem of third-party packages that supplement the core library functionality.

This overview is divided into several sections:

1) The layer model: The pieces from which Flutter is constructed.
2) Reactive user interfaces: A core concept for Flutter user interface development.
3) An introduction to widgets: The fundamental building blocks of Flutter user interfaces.
4) The rendering process: How Flutter turns UI code into pixels.
5) An overview of the platform embedders: The code that lets mobile and desktop OSes execute Flutter apps.
6) Integrating Flutter with other code: Information about diverse techniques accessible to Flutter applications.
7) Support for the web: Concluding remarks about the characteristics of Flutter in a browser environment.

1) Architectural Layers

Flutter is planned as an extensible, layered system. It occurs as a series of independent libraries that each rest on the fundamental layer. No layer has privileged admittance to the layer underneath, and every part of the framework level is considered to be voluntary and replaceable.

To the fundamental operating system, Flutter applications are wrapped in the identical way when compared to any other native application. A platform-specific embedder delivers an entry point coordinates with the fundamental operating system for contact to facilities like rendering surfaces, availability; and succeeds the message event loop. The embedder is made in a language that is fitting for the platform: presently Java and C++ for Android, Objective-C/Objective-C++ for iOS and macOS, and C++ for Windows and Linux. By means of the embedder, Flutter code can be combined into an prevailing application as a module, or the code may be the whole content of the application. Flutter includes several embedders for common target platforms, but other embedders also exist.

At the chief of Flutter, there is the Flutter engine, which is mostly coded in C++ and supports the primitives compulsory to provision all Flutter applications. The engine is accountable for rasterizing composited scenes whenever a new frame needs to be painted. It offers the low-level application of Flutter's core API, containing graphics, text layout and network I/O, accessibility support and a Dart runtime and compiles toolchain.

B. Dart

Dart is an open-source general-purpose programming language. It is originally developed by Google and later it was accepted as a standard by ECMA. Dart is a new-fangled programming language meant for the server as well as the browser. Introduced by Google, the Dart SDK ships with its compiler. The SDK also ships with a utility -dart2js, a transpiler that produces JavaScript correspondent of a Dart Script. This lesson offers a basic level understanding of the Dart programming language. Dart is object-oriented, class-based and optionally typed.

There are some principles you need to keep in minds when working with Dart:

– Everything is an object, every object is an instance of the class. All objects inherit from the Object class.
– Stipulating static types explains your intent and permits static inspection by tools.
– Dart parses all your code before running it.

Different ways to compile Dart code:

1) Compiled as JavaScript

To work in conventional web browsers, Dart depend on on a source-to-source compiler to JavaScript. Dart was initially intended to be simple to write development tools and well-suited for current app development. When we run the Dart code in a web browser, then the code is precompiled into JavaScript using the dart2js compiler. Dart code is compatible with most of the main browsers without any need for browsers to implement Dart. Code that is written in Dart can run faster than corresponding code hand-written using JavaScript.

2) Stand Alone

The Dart software development kit (SDK) comes with a separate Dart Virtual Machine, which allows the Dart code to run in a command-line interface. As the language tools contained in the Dart SDK are written frequently in Dart, the separate Dart Virtual Machine is a critical part of the SDK. These tools contains the dart2js compiler and a pub. It comes with a complete standard library permitting users to write fully functional system apps, like custom web servers.

3) Native

Dart 2.6 with dart2native compiler to compile to self-contained, native executables code. Before Dart 2.6, this feature only exposed this capability on iOS and Android mobile devices via Flutter.

C. Firebase

Firebase which is a BaaS known as Backend-as-a-Service that started as a YC11 startup and grew up into a next-generation app-development platform on Google Cloud Platform.

Firebase liberates developers to emphasis on making amazing user experiences. There is no need to manage servers as well as to write any APIs. Firebase is your server, your API, and your datastore, all written down in a generic way that you can adapt it to suit most of your needs.

1) It's a Realtime Database

The Firebase Realtime Database is a cloud-hosted NoSQL database. It lets you store and sync your users in realtime. The Realtime Database is just one big JSON object that developers can manage in realtime.

The platform contains a great set of development tools. The Realtime Database and Cloud Firestore have the ability to store document-structured data and synchronize the corresponding apps in split second time whenever a data transformation takes place. This means that both the application and its database listen to each other, providing the user with reactive app experiences. And Firebase Cloud Functions can even outspread this functionality. These features let the developer to write backend code to reply to actions which are happening in the Firebase platform without having to deal with any servers.

Realtime Database => A Tree of Values

With just a single API, the Firebase database provides your app with both the current value of the data and any updates to that data.

2) It's Authentication

Firebase Authentication offers backend services, simple SDKs, and ready-made UI libraries to authenticate users to your app.

Normally, it would take you months to set up your authentication system. And even after that, you would have to keep a devoted team in order to maintain that system. But if you use Firebase, the entire system can be easily set up in under 10 lines of code which will be able to handle everything for you, including the complex operations like account merging.

3) It's a Hosting Service

Firebase consists of an easy-to-use hosting service for all of your static files. It assists them from a global CDN with HTTP/2. And to make your development particularly painless, Firebasehosting utilizes Super static, which you can run locally for all of your testings.

The BrowserSync + Superstatic development environment is slick. BrowserSync takes care of replenishing your development application across all connected devices and Superstatic imitates Firebase hosting locally in such a way that you can deploy straight to Firebase for production use.

4) It's a File Storage

Firebase Storage offers a simple and easy way to save binary files — mostly images, but it could be anything whatsoever to Google Cloud Storage straight from the client.

Firebase Storage has its system of security protocols to guard your Google Cloud bucket from the masses while conceding brief write privileges to your genuine clients.

IV. FUTURE SCOPE

The future efforts on our project would be incorporating the "Real Time Pulse Detection" and notification feature. As pulse detection plays a vital role in the detection of Corona Virus. Respiratory rate is the number of breathes (inhales and exhales) per minute and ranges from 12 - 20 breathes in a healthy person. Resting heart rate is the number of times your heart beats per minute and ranges between 60-90 in a healthy person, and heart rate variability is the time in between each heartbeat. The change in pulse rate will help in early detection of Corona Virus and thus helps affected ones to take preventions as early as possible. Notifying the users with current updates about the virus is also a key feature as it provides the necessary information to the user without exhausting user's time and maintains a interaction of user and the application.

V. CONCLUSION

In this paper we discussed about the application that helps its users by providing the necessary information and services to isolate and protect them from Corona Virus. The COVID-19 pandemic has made the impossible a reality. The circumstances are exceptional and may call for exceptional measures, but these should not become the new normal. This is a real risk and the tracing of citizens and workers should and will be a key. So, our App "Covid Companion" is one of the most useful and complete apps which provides all the necessary information regarding news, statistics, nearby essentials like grocery and medical stores and locates nearby hospitals, online shopping and keeps you away from the fake news which is required in such a difficult time. This makes it easier for a user to get all the essentials in one place and minimize the unnecessary outdoor activity.

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