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Mobile Application Development Using Flutter

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ABSTRACT

→ Covid-19 pandemic has made mobile apps and android application are very popular. So due to increases the demands of the mobile application, there are huge or tough competition between many application development frameworks which are available in the market. In today's mobile application development world most of the developer are believe to develop their mobile application using flutter. So here in this document we have describe all about the flutter framework and their features and performance related information. Flutter is an open source that means it is available for everyone and its high-performance mobile applications. Dart open source projects often share the results with the developer community, providing GPU rendering and UI solutions.

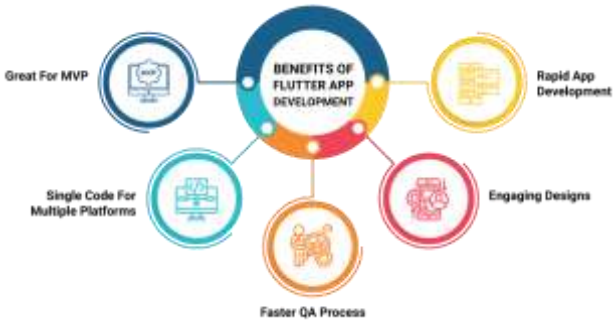
1. INTRODUCTION

Mobile application development is rapidly growing. In our starting of the daily routine to end of the day, we are uses many mobile application apps for trades, telecommunication and healthcare apps, real time monitoring apps, e-commerce related apps, money transfer apps and other are so many apps we are use in our daily based life for our comfort. Nowadays, the mobile applications unlocking relevant, organizations essential and effective to make human life easy and better. But to develop that apps according to people need are a challenging and very tough task, and one of the most or we can say major problems that are arise for development is cross-platform development. That means developer want to develop their application using which platform that support and give best user experience in every cross-platform like android, iOS and others. So, solution of that problem is flutter which solve all the problem which we have discuss.

To overcome and reduce the problem of the cross-platform, Google introduce and develop a platform which known as Flutter. Flutter is an open source mobile application development interactive framework, declared In 2017. Flutter is used to developed native mobile application with a single code. And the major benefits of the flutter is allow to run their developed application in both the operating system like Android and IOS. This means using one programming language we can developed both runnable applications. The programming language which was used by the flutter is DART. Dart language used in mobile application as backend as well as frontend development to increase the user experience while using the app. This platform not solve only cross-platform related problem also give more additional features and benefits in mobile application development.

2. REALATED WORK

Flutter is Google developed UI software development tool kit for developing crafting natively compiled android application also it is used for web and desktop related applications. The flutter is provided completed framework or tool kit to develop desirable application. Flutter is also open source that means every one should be use it freely. Flutter is cross platform so it can be interacting with network, camera, storage and geolocation. It performs better than other cross platform application development tools and the technologies. The architecture of the flutter and its engineering design helps to create responsive and user-friendly applications. Typically, cross-platform development used a code base or we can say demo code that can be used on multiple time in multiple platforms. So, using that function the development is make easy. Traditional indigenous techniques which show in above diagram use indigenous tools; That application interacts and communicated with the platform to create widgets.



Flutter considered as a framework which is very promising and currently right now has a big development community which are uses in currently application development and also user also uses flutter develop apps because it provides better user experience. Even we can see that more complex apps in the market which are uses we in our daily based life are used flutter framework to develop their architecture like google ads, Alibaba, Birch finance and other many apps. The other benefits over the flutter is that it can be used in both small and large application development. And flutter handle large size application with interact other features and google services in the application. the flutter used the dart programming language which are fastest growing programming language, and many other special features are adding in dart language to make it very useful and increase their power of the development.

3. FEATURE OF FLUTTER

(a) Flutter have many features like faster performance and its application get compiled with the C and C++ library files to create the near to the machine code which was enabling it to run more quickly as compare to other code.

(b) The library provides many widgets which saves the developer time to developed the application and make easily to customizable the application.

(c) Using flutter framework, you can write code using its library, and it also manage and run it with across multiple platform such as IOS and android. So, for that developer save their time.

(d) flutter make app process simpler and faster. also, it run updates and modified code when change should be required in application.

(e) The flutter code directly covert into the machine code without require and intermediate which save the running time of the application.

(f) Flutter documentation is well maintained and organized which helps new developer to develop application without any error.

```
└─ FlutterApplication
    ├─ android
    ├─ ios
    └─ lib
```

4. DART PROGRAMMING LANGUAGE

Flutter have not itself the programming language which was using for development. Instead, it's a pre-coded, or we can say in flutter there are many library functions which have ready-to-use and customizable SDK development code for creating widgets and other useful tools which was better performance for development. The programming language the was used by the flutter is Dart language which was developed by the Google. To avoid the using of the bridge for communication and for others,

The native layer like Android or iOS is used. The other benefits using flutter is it reduces performance issues and increases app quality which reduced the time of the app. Dart is a consumer-friendly language which is easy to use for the developer for fast apps on any platform field. Also dart language combined with the Object-oriented programming language like Java, C++, and Python, and other language. As a result, it is impossible to distinguish apps listed in Dart for the native apps and the device level.

Feature	Dart	JavaScript
Type system	Optional, dynamic	Weak, dynamic
Classes	Yes, single inheritance	Prototypical
Interfaces	Yes, multiple interfaces	No
Concurrency	Yes, with isolates	Yes, with HTML5 web workers

5. FEATURES OF DART PROGRAMMING LANGUAGE

(a) Open Source Language:

Dart is language which was using by the flutter framework for development is open source programming language that means it is freely to use by anyone. It is developed by the google and approves by the ECMA standard.

(b) Platform independent:

Dart is a language which is platform independent that means its support all primary operating system like Mac, IOS, Linux, Windows.

(c) Object Oriented language:

Flutter is support with the object-oriented programming language which support all the concepts of the oops like class, objects etc. and also its support other object-oriented concepts.

(d) Easy to Learn:

In firstly we have mention that, Dart is very easy and learnable language and google developers take many efforts to creates proper documentation which helps new developers for help.

6. FLUTTER 2.5

The first version of Flutter is launched in 2017 and this is the beginning of a new android app development framework with hybrid development of cross-platform apps that was created and lunched by the Google. Flutter is introduced in the world by storm, and after within a few years, many countless companies which are works on the mobile application development and developers adopted Flutter as their own for benefits over the flutter with other tool kit for development. Platform and configuration options for cross-platform applications. Because Flutter for you to configure mobile (Android and iOS), desktop, and, with the release of Flutter 2.0, not effected in app development also even web applications without make them difficult and changeable their codebase or rewriting them using the firebase. And Apps from scratch.

Fudge 2.5! It's a huge release, with the second highest status in Flutter's release history: 4600issues closed and 3932 PRs It teamed up with 216 case analysts from 252 contributors. Looking back at last year, we see a whopping 21,072 PRs with 1337 set donors, of which a total of 15,172. According to collect data in app development industry, Flutter ranks as second on the list of more than ten famous app development platform frameworks. That's a huge leap forward for the technology that has emerged in the world of app development Just three years ago!

With the release of the updated and newly featured version of Flutter on March 3, 2021, it's finally possible to write new code that doesn't just use zero security feature but also to migrate previous Flutter apps have not more safety and secure features. It was Tom Hoare the first system of precision type systems of resource management systems. To ensure that all references are safe to use, he decided to use a null pointer reference as the simplest solution. such as a As a result, there were no mistakes. Noise zero protection prevents errors caused by zero pointers. Makes types in your Dart code non null able as prescribed.

This means variables can't be null unless you tell them to be. Dart and Flutter have been excellent solutions for developer's productivity issues and reduced error rates by adding insecurity. With zero security now Flutter developers can specify variables that can be set to zero and all errors that had not been observed will be revealed in static analysis. This means that all topics can be viewed It was quickly fixed during the revision.

7. FIREBASE

Firebase stands for Backend-as-a-Service (Baas). It provides manufacturers with a range of tools and services to help them tool kit which is provided by the firebase achieve quality results apps, so that the grow of the app and their user base also make profit and user base also increased using the firebase feature. The firebase also built on Google's infrastructure. Firebase have another feature that is used NoSQL database program, so using that in the firebase we need to stores data in JSON-like documents. Firebase have another feature is that its supports authentication using password or phone number, Gmail account or more social media account we can use for the firebase. Firebase Authentication (SDK) can be used to manually connect one or more access methods together In the app. Firebase Hosting It provides fast hosting for websites; Information is stored between global information distributors, application testing is performed virtually And the other advantage for Google company that take from firebase is the all physical devices in Google's data centers are shipped with firebase without changing additional coding in their platforms.

Firebase is a mobile web application development platform that gives the services and the tools which are needed to create a successful one request. With the help of firebase, you can catalytic. Performance, monitoring, test lab, real-time database, certification and much more. The platform is controlled and trusted by Google Apps available on the Play store include The New York Times, Shazam and Duolingo. Firebase is a Realtime database displays which should be display the live running data in JSON format. It's also a cloud-hosted database that show other benefits for the data, it's one of the benefits of using this tool Firebase is that data is synced across all clients in real time and is available even when the app is offline. Beyond arm, Firebase Authentication, provides options for user authentication and offers customized services.

8. ARCHITECTURE OF FLUTTER

(a) Flutter Engine:

The flutter is a portable so that the running time for high-end mobile applications have more for that. It is based on C++ programming language. Applications of Flutter is built using the flutter core libraries including images and animations, network input output and files, and plugins architecture, accessibility support and a Dart runtime. Low-resolution images can be created using open Google images Sika is a library.

(b) Foundation Library:

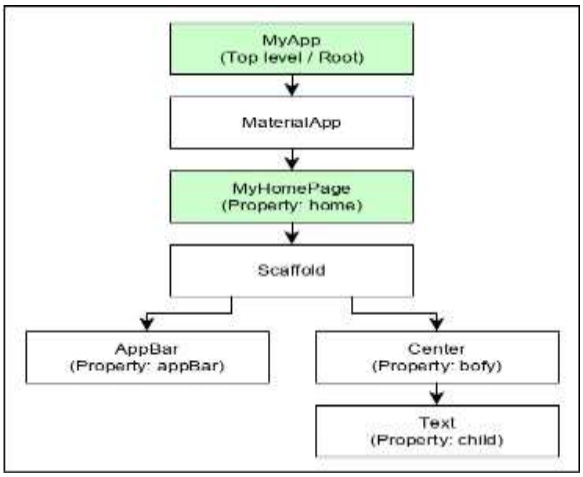
The building blocks or we can say that the popularly the flutter is used for a flutter application use packages and are included in the base library. Dart is the language of these libraries.

(c) Design Specific Widgets:

Flutter has specific widgets for a specific platform - Android or iOS. Specific Android widgets are tailored accordingly Content design guide by Android OS. Specific Android widgets are called Material widgets. There are specific iOS widgets They are designed by Apple to comply with the Human Communications Guidelines and are called Cupertino widgets. Some of the most widely used objects are the following − Scaffold, AppBar, Bottom Navigation Bar, TabBar, TabBar View, List Tile. Raised Button, Floating Action Button, Flat Button, Icon Button, Dropdown Button, Popup Menu Button, ButtonBar, TextField, Checkboxes, radios, switches, sliders, date and time selectors, Simple Dialog, Alert Dialog Common Cupertino widgets include the following – Cupertino Button, Cupertino Picker. Cupertino Date Picker, Cupertino Timer Picker, Cupertino Travel TabBar, Cupertino Tab Loft, Cupertino, Cupertino TextField, CupertinoDialog, CupertinoDialogAction, Cupertino Full Screen Dialog Change, Cupertino Page Scaffold, Cupertino Page Change, Cupertino Action Page, Cupertino Activity Dialog.

(d) Widgets:

The main focus of Flutter framework is widgets. I flap, everything is a widget. Widget is mainly user-friendly the application's user interface. The application itself is a floating widget. The guidelines are A top- level widget and its UI are constructed from one or more child widgets, which are then constructed from its child widgets.



5. CONCLUSION

One of the biggest or popular framework for mobile development or new mobile technologies on the market right now is Flutter. Flutter is basically the fastest framework so that was major benefits over another framework to adapt it over the other framework. Also, to develop cross-platform mobile application Flutter has an exciting future and huge opportunities for developers. a powerful framework and can't be ignored for now. Flutter for businesses looking to build apps on both iOS and Android is the best option. Flutter is a useful tool that provides flexible ways to create new applications. is the best choice Apps with stunning UI and high performance. In terms of speed of implementation, it is a 100% promising system.

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