A COMPARATIVE ANALYSIS BETWEEN REACTIVE NATIVE AND FLUTTER*

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ABSTRACT

All of us might have observed that the demand of applications has increased. Whether it be mobile applications or web applications, people prefer using them over visiting websites. In this paper, we will talk about two of the technologies that are used for developing applications. Flutter is a development kit and React Native is a framework used for developing applications. React Native is developed by Facebook, Whereas, Flutter is a Google product. In this review paper, we will discuss the difference between React Native and Flutter.

KEYWORDS

Applications, Flutter, React Native, Difference.

1Introduction

As digital world has overcome the whole world now and everyone is using their devices to complete all the work. Starting from setting alarms to bill payments and what not, it has become really important for the developers to be aware of the upcoming trends and technologies. As many user have different ways of using applications, like, some use applications on mobile phones, some on tablets, some on laptops/desktops etc., developers need to take care that the user experience should never be hampered. Earlier, there used to be native app development platforms using which developers were able to develop apps separately for different operating systems. However, as things change rapidly, we have now got cross platform application developing tools through which developers can use the same code over different Operating systems. Flutter and React Native are two of the cross platform application development tools. In this paper, we will be comparing these two tools.

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2Flutter and React Native

2.1Flutter

Flutter is a UI development kit by Google. It is open source and can be used for developing applications for different Operating systems like iOS, android, Mac, Linux, Google Fuchsia, Windows and web. The best advantage is that the same codebase could be used for all the different operating systems. Flutter uses Dart as the programming language. All the programs written in flutter are on Dart.

Fig 1. This figure shows the Flutter Logo

2.2React Native

React Native on the other hand is a Facebook product and it is a framework to develop mobile applications and react native as well is open source. React Native could also be used for developing apps for tvOS, macOS, UWP, Windows, AndroidTV, iOS and Android. Developers are hence enabled to use React Native's framework alongside native platform potential.

Fig 2. The React Native logo as well as the representation that it is a cross platform application developing tool

3Literature Review

Allain et. al. stated that there are several solutions present these days to develop apps. They talked about how hybrid app development is one of the solutions[1]. They also observed that the framework by Google, Flutter, is a hybrid app development solution which aims to provide the same experience that is provided by native apps. They also discussed how React Native which is the dominant one in hybrid app development has a direct competitor, Flutter. They have also discussed about Backend-as-a- Service(BaaS) solution.

Shady Boukhary et. al. expressed how Google developed UI framework Flutter gained popularity in the recent years[2]. However, the developers have to cope with the state management issue. In the paper, they have presented a new architecture for Flutter which is

based on Uncle Bob's Clean Architecture. This architecture is also released as a Flutter package. The architecture proposed is completely tested. The architecture is not just a solution for the problem, state management issue, but is also a choice for the Flutter mobile application architecture.

Fentaw et. al.discussed how there is a rise in the diversity of the devices used by people around the world[3]. They discussed that the applications developed are run on different kind of devices and it is important to keep this into consideration while developing mobile apps. They also talked about how businesses need to check this aspect before launching any app. They then discussed about the two application development tools available Flutter and React Native.

4Comparison

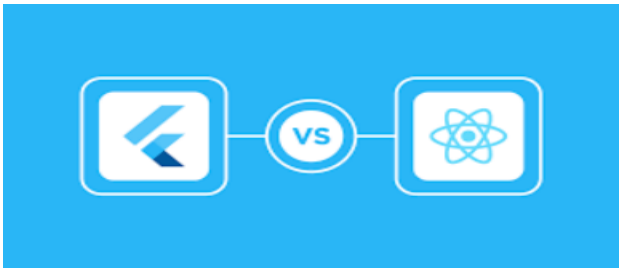

Fig 3. The picture represents the logos of Flutter and React Native

4.1Developed by

Flutter is a platform which is developed by Google. On the other hand, Facebook introduced React Native.

4.2Release

Initially, Flutter was released in May of 2017 and Flutter 2 is recently released in March 2021. React Native however is older than Flutter. The first stable release of React Native was in June 2015.

4.3Programming Language

The programming language used by Flutter for creating mobile applications is Dart. On the other side, React Native uses JavaScript for the purpose of developing mobile applications.

4.4Architecture

The architecture that Flutter uses is BLoC (Business Logic Component) Architecture. Contrarily, the architecture that React Native uses is Flux and Redux. Flux is the one that is created by Faceook. However, the one that is preferred among the society is Redux.

4.5User Interface

Talking about user interface, for building UI, Flutter makes the use of custom widgets. But, React Native makes the use of native UI controllers for creating the UI of the application.

4.6Performance

Flutter's performance is good. The compilation of the applications in Flutter is done by using the arm C/C++ library, giving it the benefit of being closer to the machine code. Due to this, the applications get a better native performance. That said, React Native's performance in comparison to Flutter is a little slow. Also, when developers run the Hybrid application architecture in React Native, they might face issues.

4.7Testing

Flutter itself has it own rich-testing set of features. With the help of these, one can perform widget testing, unit testing and integration testing. However, React Native relies on third party testing-tools.

4.8Community Support

In comparison with React Native, Flutter has less community support. However, React Native's community support is quiet strong and issues of any sort can be sorted very quickly.

5Conclusion

Cross platform applications have made it really easier for developers to develop applications. Now, they do not need write lines of codes for different platforms. Single code can be used across platforms. Which helps the developers give quality result in limited time. Also, to run a business smoothly, the business application must be developed using a cross platform application tool as native apps might result in being costlier, a greater manpower will be needed to develop two or more different applications for different Operating systems, also, people might not be so comfortable with different layouts of the application on different platforms.

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