International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 01 | Jan 2022 www.irjet.net p-ISSN: 2395-0072

THE WORLD OF HYBRID APP DEVELOPMENT

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ABSTRACT : In this developing world, technology has taken a great leap. The mobile world has also developed a lot in this generation. The mobile operating system currently consists of two big players i.e., Android and iOS. The companies which want their project to reach the highest number of customers need to develop apps mostly for these two platforms. The issue with the development of apps for both platforms is the lack of a common development framework. Both operating systems use a different approach for developing apps. So, it becomes difficult sometimes to develop apps for different platforms at a time as it includes different technologies and approaches. Along with it, there is a rise in demand for smartphones and tablets so development is getting quite challenging in terms of cost, effort, and marketing. This is where we can use the technology of Hybrid App development. The use of web-based technologies (excluding some hybrid technologies) to develop mobiles applications. The technology can develop apps for both operating systems with a single code base. This technology can be cost-efficient as well as time-efficient and hence can be a great alternative for native app development.

Keywords- Hybrid App Development, Application, Android, iOS

I. INTRODUCTION

Mobile application development has been one of the most important and growing technology in the last decade. The success of an application for mobile platforms is not just limited to mobile but has also made its way to tablets, wearables, and sensors, all of which are recognized as a part of mobile platforms. For the time the smartphone was introduced there has been great success and progress in the software platform, hardware specification, but the development method needs to still make more progress to reach a standardized level.

There are different operating systems in the market such as Android, iOS, Windows, blackberry, and many more. These different platform applications are developed with different programming languages and frameworks. Due to this variety in the operating system and programming languages, it becomes near to impossible for a hobby developer to learn all the programming languages and develop applications for all the platforms.

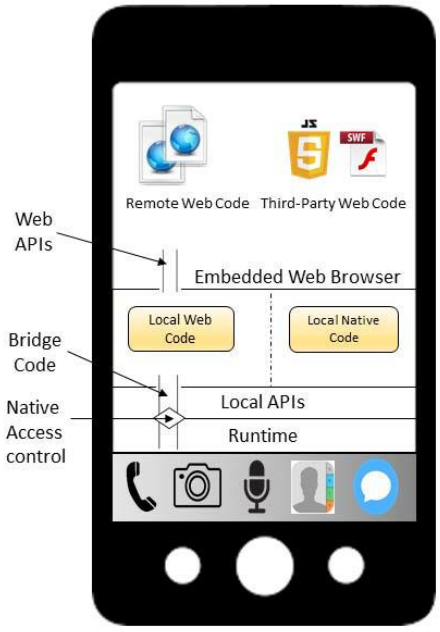
This is where hybrid app development can be handy. The main approach of hybrid app development is a single codebase for all the platforms. There are mainly two-hybrid app approaches one which uses web-based technologies and another being own rendering engines. A famous example of web-based technology is React.JS and the one without web-based technology is Flutter.

Web-based mobile application development used web-based platform technologies to develop a mobile application (HTML, CSS, and JavaScript). The code for the mobile application is written using HTML and JavaScript and then a middle-tier web-based technology is used to match the components with native mobile components.

The one which does not work on Web-based technology uses its rendering engines to match components developed to native components. Flutter is one the most famous such technology uses Dart as a programming language and then maps the components developed in this technology with native components.

II. RELATED WORK

The hybrid app development has grown significantly in the past few years. The hybrid app uses a hybrid app framework to build the app using hybrid technologies. This framework provides a mechanism to instantly port the developed app to different platforms such as iOS, Android, and many more. The main moto of the hybrid technology is “write-one-run-anywhere” apps. This helps the developer with the flexibility to write code for every platform with minimal time. Along with that the developer also does not need to learn different technologies to develop apps for different platforms. Below is a diagram that tries to explain the working of web-based hybrid app technology.



Web-based hybrid app technology codes are written technologies like HTML, CSS, and JavaScript. Then a bridge is created between our code and the native components. The components that are developed with our code are then matched with components of a native application. This bridge helps us to get native access control and Local APIs.

Although hybrid apps have can be of great use they come with some limitations. Below we have discussed native apps and hybrid apps in some detail.

Native Applications:

Native applications are developed using the native programming language of the device. E.g., If the application is to be built for iOS, it must be developed using either Swift or Objective-C. On the other hand, Android applications are either need to be developed using Java or Kotlin. Native applications provide development environment tools for making it possible to create desired user interaction experience, which is yet missing in the case of hybrid app development.

Features of Native Application Development:

1. These apps provide the best experience overall. This app comes with build-in components and ease of use, faster graphic APIs, and much more.
2. The gaming graphics run smoothly with natively developed apps.

Limitation of Native Application:

1. Apps developed using native languages enjoy benefits in graphics, app store distribution as well as device integration but lack of portability has a significant effect on business.
2. Native applications require a large investment in terms of time and money. The cost of native apps depends on the complexity.
3. The native apps have high maintenance costs as each operating system app needs to be updated separately.

The Rise of Hybrid Apps:

The hybrid app development platform is a platform that allows us to write code to “run them all”. The languages depend on what platform you choose for developing your apps but most of the platforms use HTML, CSS, and JavaScript. The code for the application is written as we are writing code for the website. Then once the code is written it is passed to the hybrid platform which makes applications match our desired apps (iOS, Android, Windows). Hybrid applications are like a combination of mobile web applications and native applications. Below are some of the advantages of hybrid applications:

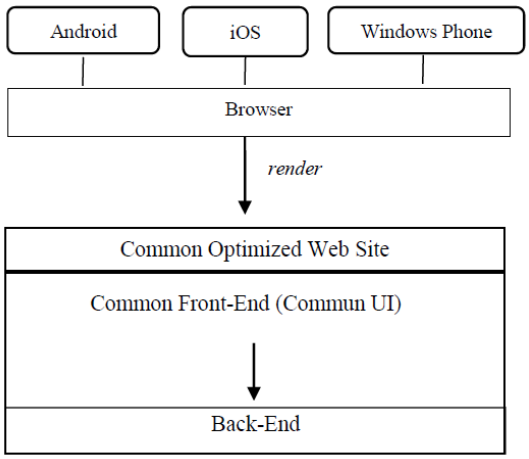
1. Write code once, deploy anywhere.
2. Can make native calls to hardware using “Native Shell” using JavaScript.
3. Can run offline without internet.
4. Can be distributed using official stores.
5. A Large number of users can be reached with minimal costing due to multiplatform support.

Hybrid Application Development Technology:

There are various technologies for hybrid app development but only two approaches on development with one environment and deployment in many platforms. The approaches can give many benefits not limited to cost minimization, man minimization. Developers need to code in any of the hybrid programming languages using a single framework that would translate the code to many platforms. The two of the main approaches are as follows:

1. Web Approach:

This technology is based on a web browser for mobile development. The apps based on this approach are developed using HTML, CSS, and JavaScript, and depend on the browser as its runtime environment and it gets benefits from browser support of the mobile application.

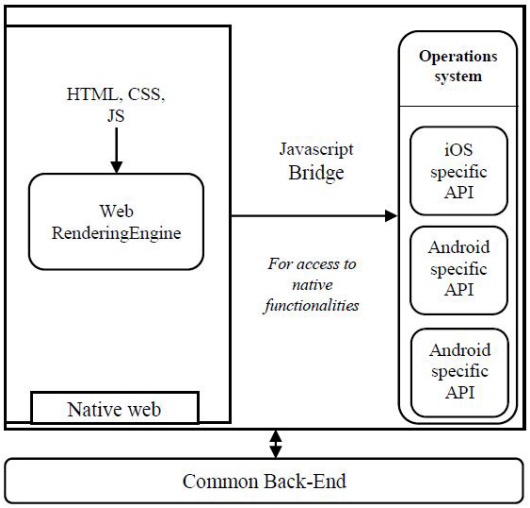


Codes for different platforms are written using HTML, CSS, and JavaScript, and then the components are rendered using a bridge or framework. Some drawbacks come with this technology some of them is access to device native functionalities (Notifications, GPS). The apps take a longer time than native apps due to the network.

2. Hybrid Approach

The hybrid apps use a combination of web technologies and native functionalities. It uses the browser engine to embed the HTML content in the web-native container. With the help of a bridge created using JavaScript, the native functionalities are accessed.

The modern hybrid application uses its languages and compiler to develop native apps for all platforms using a single language. E.g., Flutter uses dart as a programming language and uses its compiler to compile the source code to the binary equivalent of the native system.



The Code is written using hybrid technologies and then a JavaScript bridge is used to access the native functionalities. This makes the production of applications easy and cost-efficient.

Below is the table that compares hybrid and native app development:

Consideration	Native	Hybrid
Effort of supporting platforms and versions	High	Medium
Device Capabilities access	Full	Medium
User Experience	Full	Full
Performance	Very High	Full
Upgrade in the Client	Needed	Needed
Ease of publication/distribution	High	Medium

Approach:

After studying we will be using Flutter Technology for developing or app. Flutter is a technology developed by Google in 2017. Flutter uses dart as a programming language to develop applications for all platforms. Flutter uses its compiler to convert the written code in dart into binary and then matches the code to the native application. This app can call API and access all the data like a native app. Any backend technology can be used for the app.

Conclusion:

Using the hybrid technology, the app will be developed along with the web application. The app will contain the backend developed in Node.JS. The app will be using a common backend for both web apps and mobile apps.

Future Scope:

The app can be used for smoothly concluding gaming tournaments. The app can be made available to the users going further for playing tournaments and winning rewards.

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