Hybrid Applications: A Cost-Effective Approach to Mobile Application Development

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Abstract: In the era of globalization and digital world, most of the facilities are available to the users at their comfort. Each and everything is just a click away. Mobility of such facilities are of great help to the users in all the possible ways. Among them mobile applications are on top priority. These mobile applications are playing a significant role in the digitalization of services. There are different kinds of applications available these days such as native applications, web applications and hybrid applications. These applications are developed using a wide range of tools such as Android Studio, XCode, ionic, Cordova, PhoneGap. This article presents the significance of hybrid applications as a cost-effective solution to mobile application development. This study demonstrates how hybrid applications can reduce the cost and help in the effective use of resources.

Keywords: Native applications, digitalization, cross-platform, app development tools.

1. INTRODUCTION

In the present era of information, mobile applications are in a very high demand today. In information and communication technology, the flow of information takes place from one mobile device to another mobile device. Mobile applications bridge the gap between the user and the information. In today’s IT world there are three different categorizations of applications available. They are termed as native apps, hybrid apps and web apps [1]. Native applications require the standard SDK and separate programming language for their development like JAVA for android and SWIFT for iOS applications, whereas hybrid applications require a single language to build an application and the same application can be run on any platform [1]. The evaluation of hybrid applications takes place due to high demand of mobile applications on the separate platforms, therefore writing the same application in the different programming language it is efficient to write the code in one language which is executable on multiple platform [2].

2. LITERATURE REVIEW

Andrade et al, have explained the need of hybrid applications in the current era. Due to increase of mobile usage people are more addictive to access services on the mobile platform rather than on the web sites, so companies are more focused towards the development of hybrid applications. Although native applications provide ease of usage but due to less expensive nature of hybrid applications companies are moving forward for developing hybrid applications [1].

Henning et al, have given the classification for general approaches towards the hybrid application development. This article contributed towards mobile app development in different ways like it has given the overview of current approaches used for hybrid app development moreover it purposes a framework criterion for evaluation [2]. At the end they have given the detailed analysis of different tools used for hybrid app development.

The author has addressed the numerous challenges which comes towards the mobile application development. The major objective of the author is to gain the insight of various issues faced by the developers for the application development [3]. Moreover, based on their analysis the author has highlighted some of the area’s which require more attention and which can help in hassle free application development.

The main purpose of the author is to study the industry’s opinions on the development of cross platform application development due to its increase in popularity and high demand among the users [4].

The main limitation with the native applications is to transfer the code from one platform to another platform. In other words, if user wants to execute application code to another platform, one needs to write the code from the scratch. To prevent from this single codebase issue hybrid applications are more in demand [5].
The hybrid application development tools help in cost cutting and moreover it provides an easy way to the developer to develop applications for the multiple platform. The author has explained the benefits of hybrid app development tools for the developer and its users [6].

The author has given the more emphasis on the write once and run anywhere approach. The author has described the various framework with the help of which code is written once for one platform and the same code can be executed on any platform. The author has done the real-world analysis on different framework to figure out which one is more efficient in context of hybrid app development. Although there is no such conclusion drawn by the author as all the tools are providing novelty in application development [7].

The author has given the six categories of applications. This paper provides the benefits and limitations of each tool and programming language used for the development of these applications [8].

Anant et al have drawn the clear distinction between native and hybrid applications. The author has given the clear distinction chart which described various parameters for comparison [9].

3. ARCHITECTURE OF HYBRID APPLICATION

Hybrid applications follow the approach of write once and run on any mobile device. The basic architecture of the hybrid application is shown in Figure 1. It has four stages. Hybrid applications are developed using any cross-platform application development tools like PhoneGap, Cordova. Once the application is written using HTML5, JavaScript and CSS. The application is built for particular operating system using the standard software development kit (SDK). Like to make application work correctly on android devices we require android SDK for iOS devices it requires iOS SDK. Finally, the application is converted successfully for specific operating system, we can easily install android APK file or iPhone IPA file on our mobile devices.

![Figure 1: Architecture of Hybrid mobile application](image)

4. ADVANTAGES OF HYBRID APPLICATIONS

Multiplatform: Hybrid applications follow the approach of write once and run anywhere approach. The code for the application written in one language and it can be run on any mobile operating system [1].
**Offline mode:** Like web applications which require the working internet to access their functionality, Hybrid applications can be directly accessible without the need of working internet connections. Hybrid applications can be directly accessed on the device.

5. **HOW HYBRID APPLICATIONS HELPS IN COST EFFECTIVENESS?**

There are basically two challenges faced with the native applications. Firstly, for each native application development there are different framework and languages used like for android platform applications are usually written in android studio using JAVA language and for iOS applications, they are written using XCODE IDE and SWIFT language [3]. There is demand of different developer for developing the same application for two different platforms. It increased the cost of development. To solve this problem an organization can, develop a single application which can be run on multiplatform. Moreover, to develop a single application for multiple platform one common language is required. So rather than hiring two persons with different skill sets, a developer with some common language experience is required.

![Figure 2: Native application development process](image)

**Figure 2:** Native application development process

![Figure 3: Hybrid application development process](image)

**Figure 3:** Hybrid application development process

Figure 2 presents the application development process of native applications. In native applications there is a need of different framework, languages and skill set, which turn enhances the application development cost. The organization have to pay a huge amount to different developers, moreover there is requirement of different software to implement native applications. Figure 3 presents the application development process using hybrid application development tools. Implementing hybrid applications is a cost-effective approach which helps in reducing the overall cost of the application development.

6. **CONCLUSION**

So, at the end we can say that hybrid applications are getting more attention due to its numerous benefits. As there is no need of separate mobile application development languages, only a single language can be used to develop applications for the different mobile devices. This idea is not new but still is in infancy and bit labor intensive. There is a lot of scope of improvement in this technology, although using different hybrid application...
development tools like Cordova, PhoneGap one can develop a hybrid application but still there is need of adding more API’s and functionality, as provided by native applications.

REFERENCES


