
THE DIFERENT BETWEEN HYBRID, WEB AND NATIVE MOBILE APPLICATION

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Abstract:

There are serious grow in the number of mobile devices industry, where each year large companies such as apple and Galaxy introduce new mobile devices and tablets (McGuirk et al). Recently, in September 2015, apple just releases a new version of its iPhon's series called iPhone 6 (Apple, 2014). Such growth cause large, medium and even small companies to think about developing applications for those mobile devices. Clearly, companies should know the different between developing a native mobile application that is install from big online market such as Apple Store or Google Play, web application which should be render in the mobile device browser or hybrid mobile application which is a gather some characteristics from both previous ones. Enlighten the organizations with available options would certainly help them to pursue the right choice.

Brief History

"The history of mobile application begins with the history of the mobile devices" (Bates, 2014). The first cell phone produced in 1973 by Motorola with cost of around \$4000. It had been used for basic calling software (Bates, 2014). According to Paul Lin in his article that in 80s and 90s the application manufacturing development kept as secrets. Later, companies deployed the Wireless

Application Protocol, Which solved some issues with that days' mobile problems. On the other side, such evolvement enlightened the user to the drawback of single manufacturing application. The first attempt of Touchscreen devices has developed in 1993 by IBM with built-in application such as clock, email, calendar and notepad. By 2008, Apple released the first iPhone and its apple store. Accessing and installing application was easy, however the application varieties were limited, which open the door the development of application for companies. By 2011, millions of application has been developed and become available for the user. Billions of downloaded applications took place in the marketplace for Apple store and Google play Such as Angry Birds with one billion download, Draw Something and Instagram with 50 million downloads (Lin, 2014).

IS IT IMPORTANT TO KNOW THE DIFFERENT BETWEEN THE CURRENT APPROACHES OF MOBILE DEVELOPMENTS?

The answer is yes. Some interested statistics approve that the world is going to use mobile. Therefore, companies and organizations become more interested in creating mobile applications. In a survey conducted 2012 done by Meeker, business expert shows that a around half of American kids in ages between 6 and 12 want mobile devices as gift, specifically iPhone, iPad, iPod and iPad mini. Also, Pew Research Center asserts that the percentage of American adults who own tablets grows from 2 percent in 2009 to 29% in 2012 and there is room for growing. Moreover, 24 percent of all Christmas purchases took place online using mobile devices (Olson).

Introduction

When some organizations or companies want to develop a mobile application, they face a challenging question what type of mobile application Native, web or hybrid application should be selected? Defining each of these concepts, clarifying the fundamental

features and showing the main drawback will help to address this crucial question.

WHAT IS NATIVE MOBILE APPLICATION?

Native application that is the one build for specified platform or mobile device (Rouse). For a particular platform all application is coded using a particular language (Janssen). For example: developers use an Objective-C to develop an application for any of Apple's Products such as iPhone. Also, developer use Java, which is an Object-Oriented Language frequently to build applications that work with Google's Andriod (Smith, 2013).

WHAT IS WEB OR HTML5 MOBILE APPLICATION?

Web application is a well-designed HTML file that is rendered in any Mobile device and built with server-side technology (Mario Korf and Eugene Oksman). It helps to give alternative display similar to those website accessed via personal computer (Janssen). Mobile web applications build with three important components HTML, CSS and JavaScript. They are not requiring specific platform, operating system or special device (Mobile Web).

WHAT IS A HYBRID MIBILE APPLICATION?

Hybrid mobile application combines some feature from mobile web application and mobile native application (Rouse). Hybrid application is work like a web application but it has to be installed like the native application. There are two ways to implement the code:

- 1- Local: packages the HTML code inside the mobile application binary file.
- 2- Server: stores the HTML file in the server and use container as shell (Korf et al)

NATIVE, WEB AND HYBRID APPLICATION FEATURES

Each type has its own features that make it different and special. Here are some differences:

Speed: Literally speed plays an important role especially for application with large data. Native applications provide the fastest graphics presentation. (Korf et al). As live example, Facebook's company decides to change its Facebook's application and convert it to native one for iPhone and iPad and as result this changes significantly increases the speeds of those versions and gives the users the best experience (Arthur). Companies competes to develop a highly speed performance application.

Application development process: Each native application is developed uniquely for each platform has it own development process environment. As mentioned before that each native application developed for particular device or platform uses different languages and it has its own unique SDK tools and unique interface controls. In fact, there are several tools and frameworks to build the native application.(Viswanathan).

Accessibility: Using the approach of native development gives the developers the opportunity to fully integrate the device capabilities such as the camera, gesture, barometer, gyroscope and accelerometer (McGuirk et al). Therefore, the native application gives the user the best experience in term of taking full advantage of the device-feature.

Offline feature: Advance feature of developing native application is the ability to directly access the local device storage. This feature gives the developer the freedom to customize database or storage (McGuirk et al). Genuinely, native application does not require connectivity to work (Budi, 2013).

Push Notification: Native application support push notification, which is a technique used to tell the user about updates, messages or alerts. Such feature is added after the user install the application and it can be turned on or off (Costello). What is good about push notification is that it saves the devise battery and helps to reduce network usage (McGuirk et al).

Application Distribution: Native applications are distributed, found and downloaded via the online market stores such as Apple Store and Google Play (Matzner). It is good to indicate that it is hard to reach the users with tremendous number of applications in such stores (Serrano).

Update: When the time comes to update a native application, which is not an automatic feature then the user need download the upgraded version after a notification pushed to the user (Summerfield).

Cost: Building a native application is definitely expensive. Further more, the maintenance process would not be easy for both the developer and the user (Budiu, 2013).

Mobile Web Application:

Web application depends on the browser that will render the HTML, CSS and the JavaScript code. For instance, Safari is mobile browser used to display websites or web application. The speed of mobile browser has increased significantly after the existence of 4G. However, relying on mobile web is not efficient enough until the 4G become popular (software). According to a survey published by the web performance division of Compuware Corporation states that 39 percent of people prefers quick response from website in favor of functionality. Moreover, about 32 percent of people will close the website if it takes 1-5 second to load the contents (Compuware). We can say that slow network latency in a thumb of any mobile web application (McGuirk et al).

Web application uses the popular languages; HTML, CSS and JavaScript across all platforms and they do not have SDK tools. It runs on different mobile devices and uses their browsers (Viswanathan). In simple word, single website can be render in a different platform and different devices (Summerfield).

In point of fact, it is impossible for mobile web application to access on-board hardware on a mobile device (Budiu, 2013).

Mobile web application automatically updated. In reality it is easy for the developer to edit the content or the design of the website and the changes will be visible to the user whenever they load the website. Obviously, Web application requires Internet connectivity in order for the pages to be display and for the updates to take place (Summerfield).

Web application reach the users effectively because the user will search for some information in the search engine and a web application will be display automatically (Budiu, 2013). Even though mobile web application is easier than the other approaches when distributed, still user may find difficulties finding them since there is no specific market place to market such applications (Serrano).

In compare with native application, web application development cost is much less. Also, maintaining web application can be accomplished as much as needed and it is relatively easy (Budiu, 2013).

Mobile Hybrid Application

Hybrid mobile application is a web application written with HTML, CSS and JavaScript packed with native application, which works as container. PhoneGap is used to build such container (Korf et..al.). Such approach gives the HTML code the abilities to use the device-specific feature, which enhances the user experience (Serrano). Generally, hybrid application takes all advantages of native application such as offline access, push notification and the use of market place. On the other hand, since the hybrid application is browser-based, the application performance will be slower than it would be build natively (McGuirk et al).

Discussion

Obviously, each of hybrid application, web application and native application has magnificent features, which partially or fully would satisfy any organization or company if they decided to develop a mobile application.

HTML web application seems to be the easiest one to develop and it is also the widest one to reach all platforms and different devices. However, companies and organizations should take into consideration that developing with web application would cost that the user will not interact with device feature and this not the ideal solution. For example, the user will not be able to experience the multi-touch input (korf et al).

Native application is most efficient among all other development approaches and the user would have the fastest responses and best interaction with device, nevertheless it is the hardest in many aspects. Native application development requires very knowledgeable developers. Also, what make it further complicated is there are different tools, operating systems, APIs and devices with various capabilities for each platform (Charland et al).

Hybrid can be use to build an application for existing web sites that can be install and download in the user's device and use an embedded browser to render the content. As a matter of fact, it is a great solution to have across-platform with out huge development costs and time (Budiu, 2013).

In Conclusion

A decision to build web applications, native applications or hybrid applications depends on some relevant and tangled factors such as the importance of the application speed and performance. Also, companies and organizations should check the developers' availability and knowledge. They must answer the question whether their companies and organization need to develop for all devices and platform or just a particular type. Further more, cost and the time to build the application should be take into consideration.

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