A DESCRIPTIVE STUDY ON MOBILE APPLICATIONS FOR USER INTERACTION

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Abstract

The growth of smart phones and tablets extensively increased with the use of mobile applications, such as native & hybrid applications. The aim is to increase the use of mobile applications for developing country strategies. We have different types of mobile application development. Native and hybrid are the most popular apps. Native apps are developed for specific platform and hybrid apps are developed for cross platforms. Each type of application development has its own strengths and drawbacks. The mobile web applications have poor performance for Gps and camera. So, these applications are alternative for native applications. The Html5, and related technologies css, JavaScript make these apps more powerful in the aspects of design, animations, and functionality.

Keywords: Mobile communication, Native Apps, Hybrid Apps, HTML5, Css, JavaScript,

1. Introduction

In mobile application development, applications are developed for handheld devices such as mobile phones, tablets etc. the application installed in your devices is related to specific platform.

1.1 Mobile computing technology

The aim is to increase the use of mobile applications by using Mobile computing technology is followed Which allows transmission of data from different system to any other mobile device without having any connection. i.e. mobile communication, mobile hardware, mobile software.

Mobile communication:

By using Mobile communication which includes devices using protocols, services, bandwidth & protocols to facilitate in the stated services. The structure of the data format is well defined in the stated services. This provides that there is no obstacle with other existing systems which offer the same service. The overlying infrastructure is more radio signal oriented, this signals are carried over the air to intended devices that are capable of receiving & sending signals.

Mobile hardware:

Mobile hardware which includes mobile device components that access the service of mobility. It ranges from Laptops, smart phones, tablets, PCS, personal digital assistants etc. these devices will have capable to receive & sensing signals. These are configured to operate in full duplex, there by sending & receiving the signals at the same time. They don’t have wait until one device has finished the communication for other device to initiate communication.

Mobile software:

Mobile software is the Program that runs on the application on mobile hardware. It deals with the requirements & device capabilities of the applications. It facilitates and run the software in the device and also depends on the operating system that appliance. It is heart component that makes the mobile device to run the application. Portability is the main factors to run the app in different device specific platforms. This type of computing services ensures the user is not tied to single device. They are able to operate from anywhere will incorporate all aspects of the communications.

There are two types of mobile applications Development

1. Native Mobile Applications
2. Hybrid Mobile applications

We have to concentrate 2 factors in mobile app development

1. User interface design (UI)
2. Efficient utilization of device capabilities

Native mobile applications are developed using the native language of the device specific platforms i.e. for example Objective C on iOS platform, Java on Android and .net on Windows. The main Advantage of building Native Mobile Applications is to improve the Performance of the Application. Native Mobile Applications are compiled on device specific compilers for iOS Apple LLVM compiler and for Android, Java compiler. Developing Native Apps
is bit difficult despite of the More Number of resources need for Development it may be difficult to understandable to normal developers. As code must be written to specifically for targeted device platforms, as the same code will be rewritten for other different platforms. The logic is same but the Language & APIs of the development process is different for other mobile Platforms.

Hybrid mobile applications are similar to web Application development contains wrapper in the native Browser such as UIWEBView in iOS Application Development and Web view in Android App development. Hybrid mobile Apps are developed using different mobile frameworks JqueryMobile, Angular.js, Sencha touch frameworks. The main Advantage of building Hybrid mobile applications is most of the code is reusable for other mobile platforms. Which requires less number of developers required to develop hybrid application Development.

Most of the code is written in Html, CSS, Javascript libraries wrapped in Native application using Cordova framework. The Application Development is Faster & simple easy to maintain because of same code is reused for all platforms except for plug-in specific to device platforms. Main concern of developing hybrid applications is still depending on the native browser. Which means rendering of the application is bit slow compare to native mobile development. Developing hybrid Application using HTML, CSS & jQuery, JavaScript to write the code and wrapped in a native web view with Cordova framework. Developing with Titanium is bit Different, titanium provides its own API to develop the Applications.

2. Native Mobile Applications

Native application development is target to specific mobile platform. Native apps are developed through native programming languages. Developing Native apps improves the application performance and provides rich graphical User interface such as UI animations, 3D animations etc. and also it provides access to the device specific features. To create best user experience, native app development is a better choice.

2.1 Advantages of Native apps

Performance: native apps are developed for specific platform. We use objective-c in iphone, java in android, so it has efficient utilization of device capabilities. Usability: each device has specific functionality and features in using native apps like accelerometer, multitasking, GPS location etc.. These features are easily accessed in native API.

Built in components: native apps have the ability to work with built-in components camera, address book, geolocation etc., often making them faster and easier.

Security: native apps are associated with an appstore. so the security and performance of app is improved. Native apps are easy to find and download for a user.

User experience: we use graphics and animations. So it provides best user experience

2.2 Disadvantages

Platform dependent: we have to develop separate apps for each and every platform. so it is platform dependent.

Increased development time and cost: each platform supports specific language and environment. It is more expensive and takes more time.

Higher maintenance: more number of developers required to maintain the applications.

App store restriction: native apps are distributed through appstore.it provides strict content guidelines.

3. Hybrid Applications

Hybrid apps are developed using html5, css3JavaScript and kept into a native container like phone gap. These native containers run the web application code and package it into an app. By developing hybrid apps same code will be reused across different mobile platforms. If we want to develop simple applications in limited time hybrid app is better choice

<table>
<thead>
<tr>
<th>Multiple platforms</th>
<th>Single platform</th>
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<tbody>
<tr>
<td>1. Low cost</td>
<td>1. Fast performance</td>
</tr>
<tr>
<td>2. Quick development</td>
<td>2. Rich UI</td>
</tr>
<tr>
<td>3. Limited access</td>
<td>3. Full capability</td>
</tr>
</tbody>
</table>

Hybrid apps

Using Html5, javascript, jquery

native apps

using native API

Fig. 1 Native and Hybrid apps features

3.1 Advantages of Hybrid apps

Budget limitation: the development cost is very less compared to native apps.

Quick development: hybrid apps are developed using simple web technologies like html5, JavaScript,jquery.so it is easy to develop
3.2 Disadvantages of Hybrid Apps

Poor performance: the hybrid app UI rendering is very slow compared to native.
Technical limitations: it does not have complete access to device built in features. The UI options are limited.

4. Comparison

Table 1: Native vs Hybrid apps

<table>
<thead>
<tr>
<th>Features</th>
<th>Native</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>performance</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>UI look and feel</td>
<td>rich</td>
<td>Normal</td>
</tr>
<tr>
<td>cost</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>platform</td>
<td>dependent</td>
<td>independent</td>
</tr>
<tr>
<td>security</td>
<td>high</td>
<td>Low</td>
</tr>
<tr>
<td>Built-in components</td>
<td>Full access</td>
<td>limitation</td>
</tr>
<tr>
<td>camera</td>
<td>support</td>
<td>limitation</td>
</tr>
<tr>
<td>graphics</td>
<td>support</td>
<td>limited</td>
</tr>
</tbody>
</table>

4.1 Related Technologies

HTML5 is the extension of HTML. Html5 has many new features, new elements and tags. It is standard technology, recommended by W3C. CSS adds new styles to the HTML pages. The aim is to provide a better user interface and functionality to the user. JQuery & JQuery Mobile are the extensions of JavaScript. JQuery is a Scripting language used for browsers. JQuery Mobile is used for creating friendly mobile user interfaces.

Table 2: New Functionalities for HTML5 and Related Technologies

<table>
<thead>
<tr>
<th>New Features</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalable Vector Graphics(SVG)</td>
<td>Used for Animations, Graphics</td>
</tr>
<tr>
<td>Canvas</td>
<td>Used for Graphics including JavaScript</td>
</tr>
<tr>
<td>Local Storage</td>
<td>Used for Offline Purpose</td>
</tr>
<tr>
<td>Responsive Web Design</td>
<td>The designed page is Perfectly displayed on every screen size and device using CSS</td>
</tr>
<tr>
<td>JQuery Mobile</td>
<td>For building Mobile Friendly Sites</td>
</tr>
</tbody>
</table>

4.2 Comparison of application development

5. Conclusion

The choice of the developing mobile application depends on the requirements of the application and business considerations. Hybrid app is preferred for simple UI and short timelines with low cost. Native apps is preferred for rich UI animations and access to the device specific features with more security. The efficient utilization of hardware devices is with Native apps. Hybrid apps are the substitutes for Native apps.

References