Native vs. Hybrid Mobile Applications as Society Enters the Internet of Things

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ABSTRACT

For nearly two decades, desktops dominated as the primary means of accessing the internet until 2007, the era of mobile phones with touchscreen capability entered the market by Apple Inc. Currently, the high demand of accessibility and mobility through mobile technology is adding more pressure on application developers leaving them to focus more on “meeting deadlines than application security,” which is a critical component as hybrid applications play a significant role in the advancement of IoT and cross-platform compatibility. New technologies are adopting unresolved security issues from the latter. This article aims to initiate discussions within the development and research community regarding hybrid mobile app security, market, role in IoT, advantages, disadvantages, security challenges and the best practices as society enters into a new paradigm envisioned as a ubiquitous global network.

KEYWORDS

Android, ASP, CSS, Developers, HTML5, iOS, JavaScript, Mobile Device Security, Objective C, PHP, Smartphones, Unified Networks

1. INTRODUCTION

Within the last decade, consumers and enterprises have purchased more products and services online than traditional methods. In most cases, businesses are marketing where customers are (mobile) for making discovery readily accessible. Thus, extending customer reach, which justifies the need to implement hybrid mobile applications crossing platforms disregarding and countering a user’s mobile device preference.

Initially, mobile application development focused on specific devices (native), while currently with the massive growth in mobile users and applications the focus is on reaching as many customers as possible calling for multi-platform development (hybrid). Hybrid mobile applications functions as a bridge between native and web applications. Exploiting the universal mobile capability of HTML and crossing platforms. This article discusses the relationship between hybrid applications, IoT and cloud computing as society moves closer to a unified platform.

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2. BACKGROUND

Before the smartphone era, cellular phones mainly focused on email and short message service (SMS). The mobile browsers were only capable of displaying simple text, links and low-resolution images. During that era, a vast majority of cellular phone users were business professionals and early technology adopters. Until Apple Inc. released the iPhone changing the perspective of the mobile user experience as it enabled users to customize the mobile device making it unique to individual needs through third-party applications.

The original intent for third-party applications was to utilize open web technologies with Dashcode software which paved the way for native apps (Block, 2006). As the technology industry moved forward, start-up and other companies seek competitive advantages to reach more consumers by tasking developers to merge native and web code hence the term hybrid. By doing so would cut costs of not having to create the same app on different native platforms as startup companies were often limited to only one platform due to budget restraints. As hybrid apps became more of interest, it generated debates regarding performance. Some developers witnessed slower speeds during 3D and image rendering with hybrid apps while business applications performed exceptionally well.

According to Vic Gundotra, Google’s vice president of engineering during a 2009 interview stated that “even Google was not rich enough to support all of the different mobile platforms from Apple’s App Store” (Charland & Leroux, 2011). Platforms such as BlackBerry, Windows Mobile, Android, and many other platforms further acknowledged the advancements towards applications delivered through a web browser would be beneficial to reducing development expenses (Hickins, 2009; Nuttall, 2009).

The use of applications popularized by Apple Inc through the App Store primary intentions was to provide users with similar if not the same services as those accessed on personal computers. This move separated the services rendered from an integrated desktop system to mobile devices with limited hardware resources adding customizable features thus extending the user experience and capabilities.

In its simplest form, mobile apps are generally PC based applications ported into a mobile device. This technique was prevalent amongst the gaming community but becoming absolute as more robust apps enter the market except for developing, testing and virtual machines (VMs). The three main categories of mobile applications are:

2.1. Native

This type of app previously dominated the market, and specially developed for one platform, i.e., Objective C with iOS and JavaScript for Android taking full advantage of the device features such as camera, GPS, and contacts. Native apps can be fully functional offline depending on the purpose of the application. For distribution, the application must be re-written for each platform often changing the functionality of APIs, i.e., Video games for video consoles are usually platform specific unless re-written to market on another.

The main features of native apps are:

- High reliability
- High performance
- Enhanced user experience
- Supports online and offline
- Take advantage of the device’s resources

2.2. Web

Web apps may have the look and feel of termed true apps. However, they are carbon copies of websites and typically written in HTML5 hence web. This approach makes saving/installing web archives on
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