TRIGENT

Choosing the Right Platform for Mobile Application Development

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Introduction

A report by Gartner[1] predicts that by the year 2017, mobile apps will be downloaded nearly 268 billion times, generating revenue of more than $77 billion, making apps one of the most popular computing tools for users across the globe. As a result, Gartner predicts that unique mobile users will provide personalized data streams to more than 100 apps and services every day. These predictions clearly indicate the huge market potential for mobile apps, paving the way for organizations, small & large, B2B and B2C, to adopt a mobile-inclusive strategy.

Several businesses have leaped ahead and already created their mobile presence. They have also learnt their lessons, the hard way, as they struggle with issues related to managing information silos on multiple platforms, disparate web and mobile presences, maintenance issues and several others, all adding to ambiguous ROI. The question takes on additional complexity in the form of budget, time-frame, target audience, functionality and look and feel of the apps to name a few.

The argument then would be to turn it backward and view mobility from the perspective of the business objective. From that approach, it becomes far easier for an organization to arrive at a mobile strategy and choose the development approach for mobile application, namely native, web or hybrid. This white paper analyzes three options with the author's recommendations.

Understanding Native, Web and Hybrid Approaches

Native Apps

Native apps are written for specific platforms, and can easily interact with and take advantage of the operating system. The key advantage is their ability to use the devices hardware functions such as GPS, accelerometer, camera, finger print reader, etc.

'Native' apps are developed using the language, tools, and framework for a specific platform using an Integrated Development Environment (IDE). They are typically built using development tools and languages that the respective platforms support. For example, XCode and Objective-C for iOS, Eclipse, Android Studio, and Java for Android, Visual Studio and C # for Windows, and etc.

> Icon Factory, a company that made Twitterific, a Twitter app, published a cost breakdown for the app construction. $165,000 (1,100 development hours) for the code only (the iPad app also used existing code valued at $20,000). Design phase cost was about $34,000. Project management, testing, and other costs were around $16,000." - http://www.godfrey.com/en/fwdb2b/digital/cost-to-build-a-mobile-app

Native apps have binary files, downloadable onto the device and thereafter stored locally. On initialization and launch, the native app interfaces directly with the mobile operating system without dependency on an intermediary. The native app often has several unique features and functions specific to the mobile OS and the device itself.

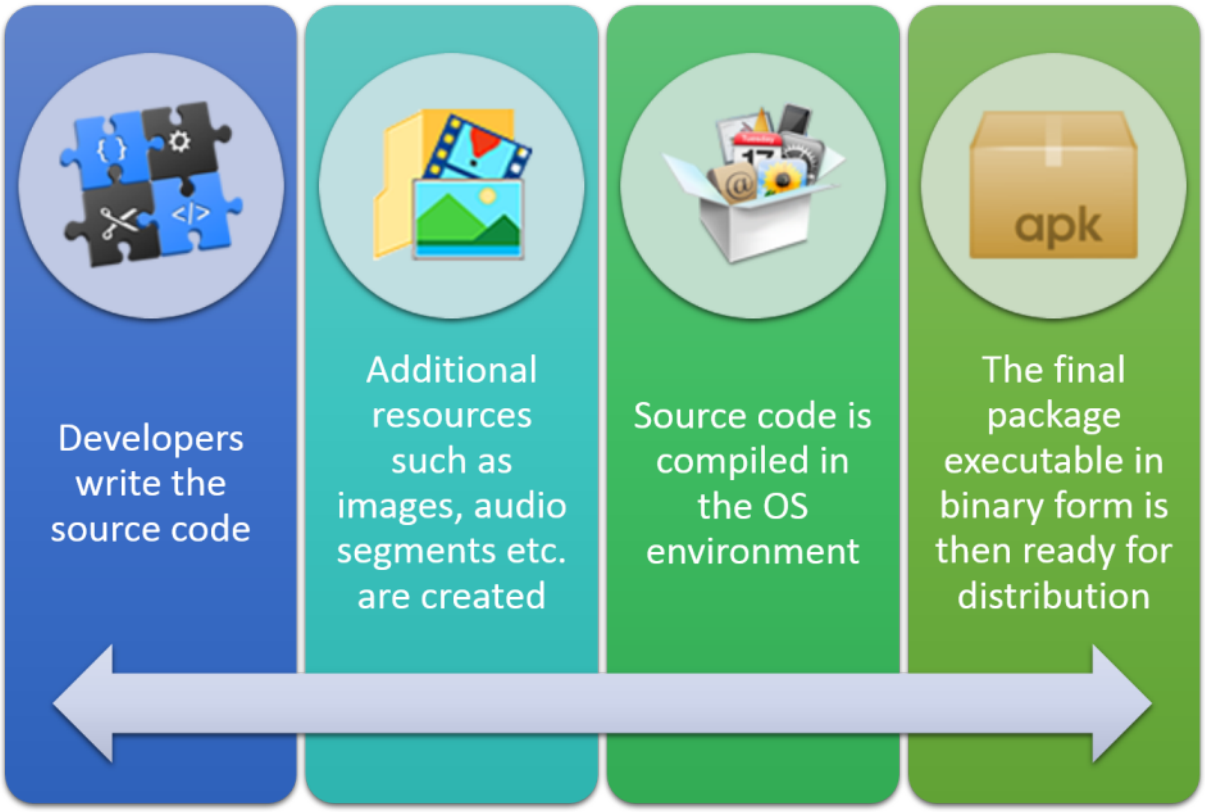

Figure1. Native App Creation Process

Mobile websites

Current generation mobile devices contain powerful browsers that support advanced JavaScript, Style Sheets and HTML5. Recent advancements in technology such as HTML5, have helped to create new standards in mobile development. The new web-based applications offer advanced UI components, rich browser-based applications, geo location and offline availability. Developers are empowered to create powerful applications, using web technologies. Companies which want to maximize the benefits of a web-based platform, offer mobile sites which resemble a native app and can be launched from a shortcut.

> A VisionMobile 2014 study of over 7,000 developers found that "15% of app developers use HTML5 beyond the browser, via hybrid apps or HTML5-to-native tools." - http://developer.telerik.com/featured/the-state-of-hybrid-mobile-development/

These mobile websites are optimized for smart phones but since they are web based, they have the capability to move beyond mobile and onto the Internet.

These mobile websites use standard web technologies-typically HTML5, JavaScript and CSS. This standards-based approach to mobile development creates cross-platform mobile applications that work on multiple devices. These mobile friendly websites can be accessed via any mobile device using a browser. An update in one server location make the latest application is accessible every time. The main considerations are restructuring the content to fit onto the screen of a smaller device and creating responsive design for multiple screen sizes. There are different approaches to render the same page across different screen sizes of mobile phones or tablets. One such popular method is Responsive Web Design (RWD). If the web pages are built using RWD approach, same page will render differently on different sized screens of devices thus giving a good UI experience to end users.

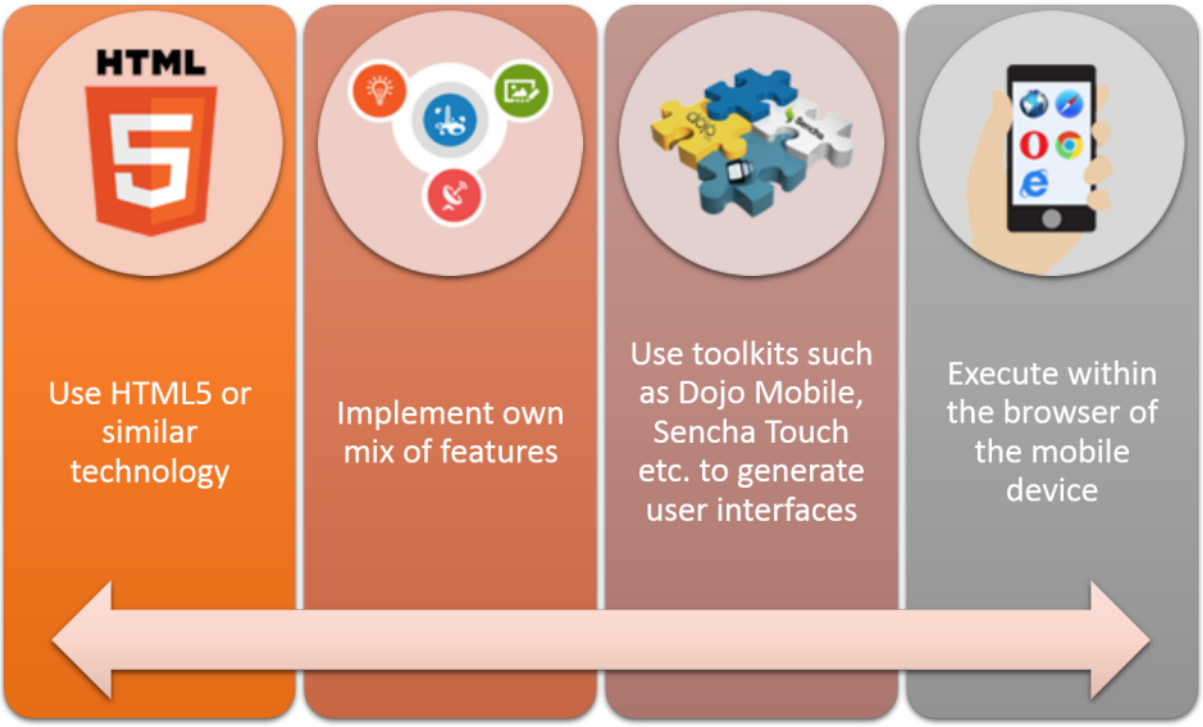

Figure2. Native App Creation Process

Hybrid Apps

Hybrid is a combination approach of native development with web technology. Hybrid mobile apps are like any other apps on the phone. They install on the device. They can be found at app stores. But hybrid mobile apps are built with a combination of web technologies like HTML, CSS, and JavaScript. Can also use many of the JS frameworks. Hybrid apps are hosted inside a thin native

> Gartner says, "By 2016, more than 50 percent of mobile apps deployed will be hybrid". http://www.gartner.com/newsroom/id/2324917

application. This native application utilizes the mobile platform's web view. Web View can be treated as a kind of browser that runs the hybrid app. Such apps may have access to device capabilities such as the accelerometer, camera, contacts, and more. Today, most hybrid mobile applications leverage "http://cordova.apache.org/" Apache PhoneGap/Cordova, a popular cross platform that provides a consistent set of JavaScript APIs to access device capabilities through plug-ins, which are built with native code. Same code can be reused for building apps on multiple mobile platforms.

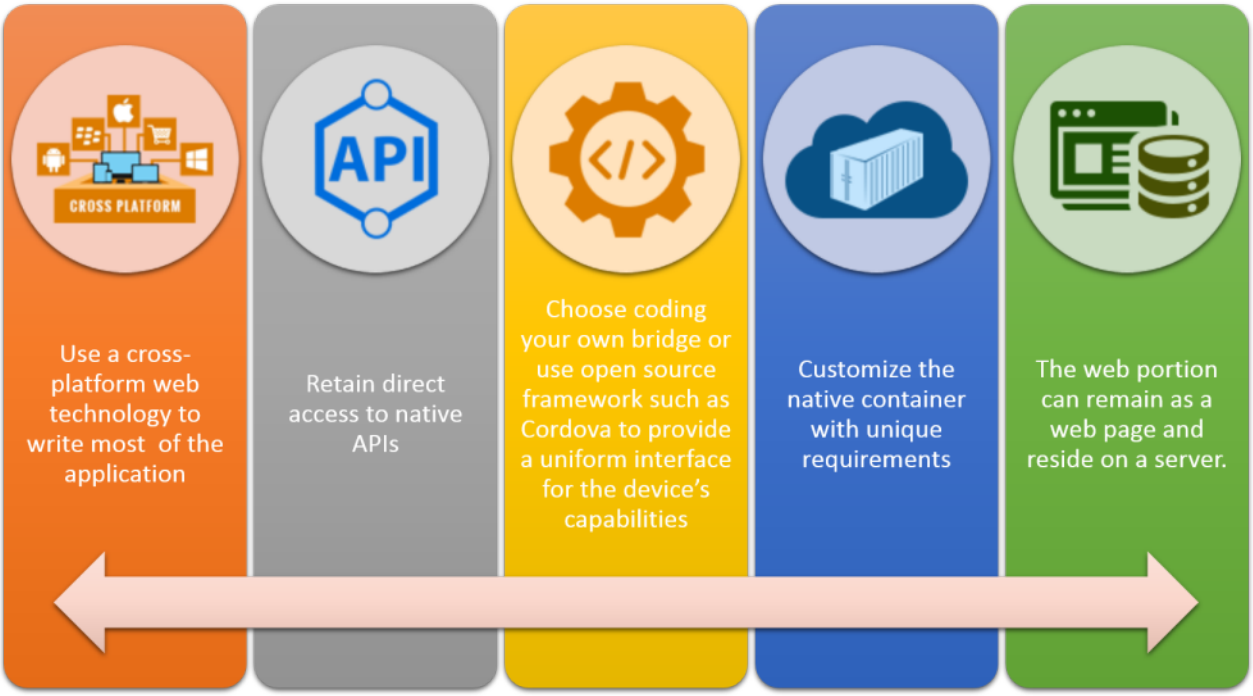

Figure 3. Hybrid App Creation Process

Advantages and disadvantages of the three approaches:

	Pros	Cons
Native	❑ Can use hardware supported features since the OS and, hardware are accessible through platform APIs and tools. ❑ Best UI as it uses native controls of the platform ❑ Offering better performance, native apps are suitable for games and applications that need real time performance. Best user experience includes fast and fluid animations as well as full access to phone	❑ No cross-platform portability or code reuse in other platforms. ❑ Maintenance costs are high. Depending on the complexity of an update, on an average $10,000 dollars are required for a version change. A more complex app or more complex update may cost more. ❑ Time to market is more.

	hardware, multi touch support and the latest APIs. ❑ The application can be cached and run as a local standalone application.	
Web	❑ Completely platform agnostic. ❑ Easy to develop and use. ❑ Easy deployment-Latest version can reach the end users instantly. ❑ It is independent of device platform. The server side code can be written in .NET, PHP, or any other language that outputs HTML. ❑ Can be accessed using any mobile device –best platform compatibility. ❑ Lower development time and cost. Since the mobile web app is essentially a different front-end for your website the development cost is much lower than that of an independent App.	❑ Lack of native UI controls. ❑ Application capabilities limited to web technologies - 3D games or processor hungry applications that heavily use touch and gestures are difficult to implement. ❑ Integration of hardware components can be challenging.
Hybrid	❑ Mostly Platform agnostic - Can be easily ported to other platforms. ❑ The biggest advantage of a hybrid app is that unless there is a functionality change in the app, all the content will be updated from web server directly. This is one of the reasons that most Banks, News and Media apps in the market are hybrid.	❑ Lack of native UI controls. ❑ Resolution and graphics may not always be good. ❑ Depending on the framework that one adopts, there might be difficulty to adopt native features. ❑ Speed and responsiveness tend to be significantly lower. ❑ Complicated UI widgets (such as tree controls) are harder to do. ❑ Browser incompatibilities may cause a lot of extra work.

Which Platform Works Best?

The native app development's advantage becomes its Achilles' heel. It is unique and platform specific, limiting its use to the platform for which it was written. This makes the development and maintenance of native apps for multiple OSs a long, tedious and expensive undertaking. The question which then remains is, if there is this disadvantage, then why do developers build native apps at all. The answer is native applications are by far the best means to create rich mobile applications that make full use of all the functionality that modern mobile devices offer.

Web-based apps, on the other hand, can be easily ported to any platform with a web browser. With a huge community support, development should be easier. However for fast development cycles, it is better to go with outsourced development service companies that offer experienced resources in Java, JS, HTML and CSS.

Hybrid development requires clear thinking into the strategy and some questions need to be answered before deciding on this method. Questions relate to which mobile platforms need to be targeted, whether the distribution will be via an app store, is it important to utilize all the features of the targeted mobile device and whether the model really makes business sense.

Trigent offers a portfolio of tools, services, and applications to develop a range of mobility strategies across platforms and devices. It has also, over the years, built several custom mobile applications. With experience in numerous native, hybrid and web applications, Trigent has built native applications for iOS and Android.

In a recent assignment, Trigent's client, a company that provides a content distribution platform, which helps manage, distribute and track digital media and content securely to intended recipients through anywhere/any device, wanted Trigent to help write a mobile application. Some of the features of the existing application were

- Cloud based solution.
- Sender could control how many devices a recipient could activate to receive the content
- Eliminate the risk of files and videos being passed by the sharing of usernames and passwords, or unique URLs.
- Track content access, access duration, what parts of the document were of most interest to the recipient and many more analytical metric
- Personal water mark stamps on each and every file to stop data leakage.

Trigent chose to write two separate Native apps – One for Android and one for IOS. The Mobile support extends in both directions, so senders can securely distribute, track, and analyze content from their phones and tablets and receivers now have secure content. Security is the biggest concern and hence writing a native app was considered to be the best choice. Performance and quick transfer of files were another major factor in choosing a native app.

Summary

In conclusion, the formula by which an organization prefers to develop one kind of an app over another rests on the delicate balance between cost and customer satisfaction based on the customer's needs. However based on our experience, it seems that hybrid apps are somewhere closer to achieving that balance. Hybrid applications also mean that updates and corrections, if needed can be fixed, centrally. Marinating the source code becomes easier in hybrid apps. Hybrid apps are quickly moving up the ladder in terms of acceptance. With increasingly faster hardware, the need for creating native apps to take advantage of an operating system are fast decreasing, at least in the corporate environment.

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About Trigent Software Inc.

Trigent is a privately held, professional IT services company and a Microsoft Gold Partner with its U.S. headquarters in the greater Boston area and its Indian headquarters in Bangalore. We provide consulting services in various technologies including Microsoft Solutions. Our operating model is to conduct sales, customer relationships and front-end consulting (e.g., business case, requirements, architecture) onsite with our clients and perform the detail design, development, integration, testing and quality assurance offshore at our world class development and support center in Bangalore. We are a SEI CMM Level 4 company and is ISO 9001:2000 TickIT certified organization.

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