

The top half of the page features a background image of various mobile application icons on a smartphone screen. The icons are slightly faded and include "Stocks" (a blue line graph), "Maps" (a map with a red pin), "Calculator" (a grey calculator interface), "Notes" (a yellow notepad), and "Contacts" (a white card).

Native mobile apps: The wrong choice for business?

Why businesses should think twice before building native mobile applications

Introduction

Native mobile applications are popular with consumers, but do their advantages translate to businesses? This white paper explores each mobile app option, and explains why businesses should think twice before taking the native approach. To understand why, we must first outline each mobile app development option.

Mobile application options

Businesses that need a mobile app have three available options:

1. Native apps

Built using the device's native programming language, native apps only run on their designated platform. For example, Android apps can't run on iOS and iOS apps can't run on Android. Native apps are distributed through their respective platform's marketplace/app store and installed on the device itself.

****Note:** We're only referencing Android and iOS platforms in the "native" category. While Blackberry still exists, and Windows Phones continue to hang in there, they don't own a [significant marketshare](#).

2. Mobile web apps

Mobile web applications run in the device's browser and operate across all platforms. For example, a mobile web app works equally well on Android, iOS, Blackberry, and Windows Phones. Unlike native apps, mobile web apps are distributed via the web, and are not installed on the device itself.

It's important to note the differences between a mobile web page and a mobile web app. While often confused, mobile web apps and mobile web pages are quite different. A mobile web page is a static HTML/CSS/Javascript page formatted for use on a mobile device. A mobile web app connects to a back-end database and requires underlying business logic.

3. Hybrid apps

Hybrid apps are a cross between native apps and mobile web apps. A hybrid app is a mobile web app wrapped in a platform-specific shell. This platform-specific shell gives the application native qualities, such as full device integration, native installation, and app store/market distribution.

Mobile Comparison Chart

To help you understand all of the options, as well as the pros and cons of each, we've put together the comparison chart below. It lists the differences between each approach, and will help you get a better feeling as to which one is right for you. Some points (like development cost), require more information than we can fit on the chart. For these points, we've included a link to more information.

| | Native | Hybrid | Mobile Web |
|--|---|---|------------------------------------|
| Skills needed to reach Android and iOS | Objective-C, iOS SDK, Java, Android SDK | HTML, CSS, Javascript, Mobile Development Framework | HTML, CSS, Javascript |
| Distribution | App Store/Market | App Store/Market | Web |
| Development speed | Slow (More Info) | Moderate | Fast |
| Development cost | High (More Info) | Moderate | Low |
| Maintenance cost | High (More Info) | Moderate | Low |
| Graphical performance | High | Moderate | Moderate |
| App performance | Fast | Moderate | Moderate |
| <i>Device Access and features</i> | | | |
| Camera | Yes | Yes | Yes (More Info) |
| Push Notifications | Yes | Yes | No |
| Contacts | Yes | Yes | No |
| Offline access | Yes | Yes | Yes (More Info) |

Mobile comparison chart continued...

| | Native | Hybrid | HTML5 (mobile web) |
|------------------|---|--|---|
| Geolocation | Yes | Yes | Yes (More Info) |
| File upload | Yes | Yes | Yes (More Info) |
| Gyroscope | Yes | Yes | Yes (More Info) |
| Accelerometer | Yes | Yes | Yes (More Info) |
| Swipe Navigation | Yes | Yes | Yes |
| Microphone | Yes | Yes | Yes (More Info) |
| Best Used For | Games or consumer-focused apps where performance, graphics, and overall user experience are necessary | Apps that do not have high performance requirements, but need full device access | Apps that do not have high performance requirements, and do not need push notifications or access to contacts |

Advantages/Disadvantages of each method

Each method comes with its fair share of pros and cons. In this section, we'll explore the advantages and disadvantages of each approach, and explain why the mobile web and hybrid approaches are typically better suited for business. The chart below offers a quick side-by-side pros/cons comparison of each method.

| | Native App | Mobile Web App | Hybrid App |
|---------------|---|---|---|
| Advantages | <ol style="list-style-type: none"> 1. Highly graphical 2. App store distribution 3. Full device integration | <ol style="list-style-type: none"> 1. Future proof 2. Cross-platform 3. Low development cost 4. Simple maintenance 5. Instant updates 6. Complete freedom | <ol style="list-style-type: none"> 1. Native look-and-feel (without the native cost) 2. App store distribution 3. Full device integration 4. Low development cost |
| Disadvantages | <ol style="list-style-type: none"> 1. No portability 2. Platform instability 3. Development cost 4. Development time 5. Maintenance cost 6. Limited control | <ol style="list-style-type: none"> 1. Moderate device integration 2. Limited graphics | <ol style="list-style-type: none"> 1. Limited graphics 2. Requires familiarity with a mobile framework |

Advantages of Native Apps

1. Highly graphical

Built using the device's native language, and installed on the device itself, native apps offer the best graphics and animations. If a business needs a highly graphical application, such as a game, native apps are their best option.

2. App store distribution

Native apps are distributed through their platform's native app store or marketplace. While not often a requirement for business apps, app store distribution is essential for companies that require wide consumer distribution, or need to sell their apps. It's important to note that hybrid apps also offer app store distribution.

3. Device integration

Native apps provide full access to the device's hardware, such as its GPS sensor, contact list, camera, microphone, gyroscope, and accelerometer. These capabilities are essential for apps that require device data, like geographical location or device position/movement. It's important to note that hybrid apps also offer full device integration, while mobile web apps offer partial integration.

Disadvantages of Native Apps

1. No portability

Since each native application only runs on one platform, businesses building native apps must make a choice--build for one platform or build for multiple platforms? Unfortunately, there's no easy answer. The mobile platform landscape is largely dominated by iOS and Android, while Blackberry and Windows hold a minor marketshare. Building an app for just one platform excludes all others, yet building for all platforms requires significant time and resources.

2. Platform instability

The mobile platform landscape is notoriously unstable. A popular platform today may disappear in just a few years. For example, both Blackberry and Palm dominated the mobile industry just 10 years ago. Today, Blackberry is struggling and Palm doesn't exist. The fact is, nobody knows what the mobile platform landscape will look like in another 5 years. Companies that choose the native approach always run the risk of wasting time and money building for a platform that might not last.

3. Development cost

While native app development cost varies depending on the app's complexity, it's easily the most expensive and time-consuming approach. For example, [Forrester Research](#) estimates that most native apps require at least 6 months of full-time work, and cost between \$20,000 and \$150,000, depending on complexity.

It's important to note that those estimates apply to single-platform native app development. The cost rises exponentially when developing cross-platform native applications, as every platform requires a separate application built with a different programming language. Based on the development cost estimates listed above, the chart below outlines the cost of developing native applications:

| | Cost of single application | Number of applications needed | Total cost |
|--|----------------------------|-------------------------------|--------------------------------|
| Single-platform app | \$20,000 - \$150,000 | 1 | \$20,000 - \$150,000 |
| Cross-platform smartphone apps | \$20,000 - \$150,000 | 2 | \$80,000 - \$600,000 |
| Cross-platform smartphone & tablet apps | \$20,000 - \$150,000 | 4 | \$160,000 - \$1,200,000 |

4. Development time

As mentioned above, Forrester Research estimates that a single native app requires 6 months of development time. If building native apps for more than one platform, the time requirements rise depending on the number of developers needed and application complexity. For example, using just one developer for cross-platform smartphone app development brings the development time up to 2 years (4 apps x 6 months each). However, development time estimates become increasingly complex when using multiple developers. For instance, if a business uses four different developers for cross-platform smartphone app development, they will receive four different app designs. As any project manager knows, ensuring that multiple apps created by multiple developers look and function identically is a very time-consuming task.

5. Maintenance cost

While all apps require regular updates and maintenance, native apps require the most future maintenance when compared with the other two mobile app options. Beyond regular app maintenance, native apps must also be updated with every new platform release. Additionally, businesses that build native apps for multiple platforms must maintain multiple applications, duplicating every change or update across all applications. For instance, a minor change to a cross platform smartphone and tablet application requires changes to four separate applications.

6. Limited control

When placed in an app store, a native application is completely controlled by the app store's owner (like Apple or Google). For instance, if Apple rejects or bans a company's app from their app store, the company has no recourse. If Apple decides an app doesn't meet their terms of service, the app is removed. If another company claims copyright over an element in the app, the app is removed. Or, if Apple decides the app isn't right for their store, the app is removed. The app store model puts companies at the mercy of a third party. All of the resources put into their application are wasted if that app store's owner decides the app isn't right for their store.

Native App Summary

While native apps offer benefits in graphics, app store distribution, and device integration, their lack of portability poses significant problems for businesses. Besides the risks of an unstable mobile platform landscape and limited app control, native applications require the most significant investment of both time and money. Considering that the hybrid approach also offers app store distribution and device integration, graphics are the only advantage unique to the native approach. Unless a business requires game-like graphics in their app, the native approach offers few benefits for businesses.

Advantages of Mobile Web Apps

1. Future proof

The web eliminates the problems associated with mobile platform instability. In a world of fragmented mobile devices and operating systems, the web is the only constant. It's shared by all mobile platforms and operating systems, it's not controlled by another company, and it won't disappear in a few years. When a business builds mobile web apps, they choose a platform that will last.

2. Cross-platform

Unlike native apps, one mobile web app works across all mobile platforms and operating systems, both now and in the future. They don't need a different mobile web app for iOS, Android, Blackberry, and Windows Phones. One mobile web app works everywhere. Additionally, even if another mobile OS becomes popular in the next few years, that same mobile web app will work on that platform as well. They work everywhere, both now and in the future.

3. Inexpensive development

If a business already develops web apps, they already have the skills necessary for mobile web app development. Unlike with native apps, mobile web apps don't require new developers with specific skillsets. Most businesses already have the skills for cross-platform mobile web app development.

4. Simple maintenance

Since one mobile web app works on every platform, future maintenance is simple. All changes made to that single application instantly reflect across all platforms. Out of the three mobile app methods, mobile web apps require the smallest amount of ongoing maintenance.

5. Instant updates

Since mobile web apps run in a browser, and aren't installed on the device itself, all updates instantly reflect in the application. Users don't need to install the latest update, or do anything at all. The app instantly updates for all users. This means that all users ***always use the same app version***, which makes life much easier for the company's support staff.

6. Complete freedom

Mobile web apps are distributed through the web, not through a proprietary “app store” controlled by a third party. Companies building mobile web apps aren’t forced to follow rigid “terms of service” or risk banishment. Mobile web apps offer complete freedom.

Disadvantages of Mobile Web Apps

1. Moderate device integration

With the rise of HTML5, mobile web apps can access many device hardware sensors like GPS, file uploading, the accelerometer, gyroscope, and local storage. However, they do have a few limitations. As of now, mobile web apps still cannot access the device’s contact list or deliver push notifications.

2. Limited graphics

While mobile web apps are perfectly suited for displaying most every type of content, they do not handle heavy graphics as seamlessly as native apps. For that reason, any company requiring game-like graphics in their mobile apps should stick with the native approach.

Mobile web app summary

Mobile web apps offer an inexpensive, cross-platform, and low-risk option for companies. Unlike native apps, mobile web apps aren’t restricted to one platform or controlled by any third party. Their cross-platform capabilities make mobile web apps the simplest and most inexpensive of the three mobile development options. Unless a company requires full device integration, game-like graphics, or app store distribution, mobile web apps are the ideal choice.

Advantages of Hybrid Apps

1. Native look-and-feel (without the native cost)

For businesses that prefer the native app look and feel, without the high development cost, the hybrid app is the method of choice. Like native apps, hybrid apps are also installed on the device and launched like a typical application. These native attributes make a hybrid app virtually indistinguishable from a native app.

2. Device integration

As mentioned above, mobile web apps offer nearly full device integration, with a couple of exceptions. That’s where hybrid apps come in. Hybrid apps offer full device access, including the “native-only” features, like the camera, microphone, and address book. For companies that require access to every device sensor, hybrid apps offer the simplest solution.

3. App store distribution

While not usually a requirement for business apps, some companies need the wide consumer distribution offered by the app store. For these companies, hybrid apps are the best option. One mobile web app combined with a hybrid mobile framework lets businesses easily create “native apps” for distribution in every major app store.

4. Inexpensive cross-platform development

While not as simple as the mobile web app approach, building a cross-platform hybrid app is considerably cheaper than building a cross-platform native app. Hybrid app development consists of building a mobile web app, and then wrapping that app in platform-specific native wrappers. This process lets businesses develop cross-platform hybrid apps (that look and feel native) using their current web development skills.

Disadvantages of Hybrid Apps

1. Limited graphics

Despite their “native” appearance, hybrid apps offer the same graphical abilities as mobile web apps. Again, while mobile web and hybrid apps offer graphical capabilities suitable for most any business application, highly graphical applications are better suited for the native approach.

2. Requires familiarity with mobile framework

Turning a mobile web app into a hybrid app requires familiarity with a mobile framework. While still simpler than native app development, the hybrid approach adds a level of complexity to the mobile web app development process, as developers must familiarize themselves with a hybrid framework.

Hybrid app summary

Hybrid apps bridge the gap between native apps and mobile web apps. While mobile web apps still offer the simplest mobile app development method for most companies, hybrid apps are the next best option. Hybrid apps are ideal for any company that wants the development simplicity of mobile web apps, combined with the device integration and app store distribution of native apps.

Conclusion

While native apps are popular with consumers, they offer little value to the business market. Out of the three mobile app options available, native apps represent the riskiest, most expensive, and most difficult option for businesses. As outlined above, the three mobile app development options include:

1. **Native apps:** Native apps offer advantages in graphics, app store distribution, and device integration. However, their complete lack of portability makes native apps the riskiest and most expensive option. Considering that hybrid apps also offer app store distribution and full device integration, graphical capabilities are the only advantage unique to native apps. Unless a business needs apps with game-like graphics, the native approach offers little value.
2. **Mobile web apps:** Mobile web apps work across all platforms, provide complete freedom, and deliver inexpensive development and maintenance. Unless a business needs to sell their app in an app store or access the device's camera or microphone, mobile web apps are the ideal option for business.
3. **Hybrid Apps:** Hybrid apps are a mix between native and mobile web apps. Hybrid apps are the best choice for businesses that want the simplicity of a mobile web app combined with the device integration and app store distribution of a native app.

Businesses that need mobile apps should first consider the mobile web app approach, as it provides the simplest and most cost-effective mobile app option. Businesses that require full device integration and/or app store distribution should consider the hybrid approach, as it provides the simplest path to these "native" features without the native cost. Finally, businesses that require game-like graphics in their mobile apps are best off with the native approach, as it offers the most powerful graphical abilities.

About mrc

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