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Native Mobile vs. Progressive Web App:

Developer Evaluation Guide

You have to build for mobile. But you don't have to learn native iOS and Android development to do it.

With just over half of all internet traffic serving mobile devices, your users expect smartphone friendly services. But does that mean you have to invest in the creation and maintenance of native mobile apps?

There is an alternative. **Progressive web apps** (PWAs) give your users a native app-like experience but, under the hood, they're just standard web applications with some mobile-friendly additions. The best of both worlds. Depending on your app's needs, PWAs could help you get to market faster, improve discoverability, and reduce maintenance costs.

In this evaluation guide, we present the pros and cons of PWAs, alongside how the OutSystems app development platform can help. By the end of this guide, you'll be ready to decide which route to take for your next mobile project.

Introducing Progressive Web Apps

It might seem like you have no choice. If you want to target mobile device users then you *have* to invest in native iOS and Android apps, right?

Perhaps not. Progressive web apps offer an alternative. PWAs give you the tools to deliver a mobile app experience using everyday HTML, CSS, and JavaScript. They're fast, work offline, and "install" to the device home screen with an app icon.

So, what's the catch? That depends on what your users need and we'll cover the tradeoffs on page 7. First, let's look at what goes into a PWA.

PWA Fundamentals

At heart, progressive web apps are just web applications. They work in any browser. However, relying on the principle of progressive enhancement, they gain extra functionality — such as working offline — when accessed using a modern browser.

So, with a little extra work you can retrofit an existing web app to become a PWA. And, if you're planning a new project, you can serve both web and mobile users equally from one code base and one deployment.

Interested? Read on to learn more about how a progressive web app could be right for your next project.

PWA Fundamentals

If PWAs are just web apps, how can they offer an alternative to native mobile apps?

On modern browsers, including Safari, Chrome, and Edge, your PWA can take advantage of three technologies to deliver that app-like experience. On older browsers, your web app will work just like any other.

So, what is it that makes a PWA a PWA?

✓ Service workers

The key to a native mobile app-like experience, service workers let you run background JavaScript jobs directly on the device. That reduces the need for round trips to the server, meaning your PWA is more responsive and that it doesn't always need a network connection.
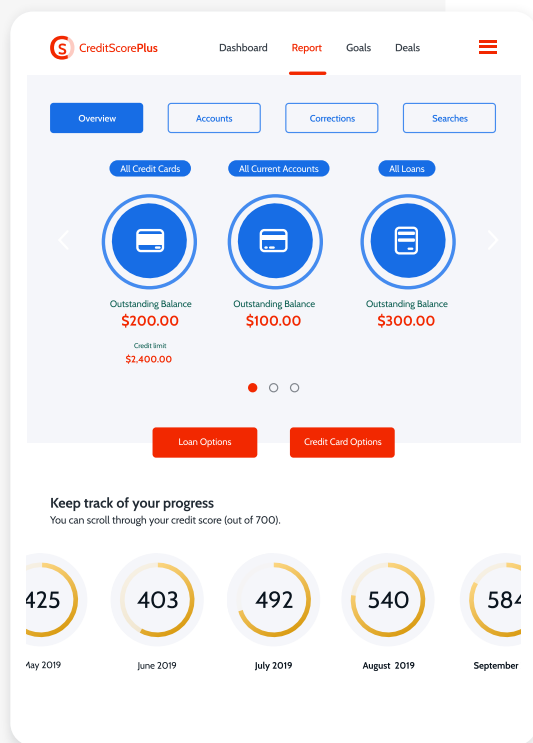
✓ Offline cache

Service workers are good for more than only improving responsiveness. They also allow you to cache data locally on the device. With functionality and data available offline, your PWA can work without a network connection and then sync with the server when the device is back online.

✓ App manifest

Just like a native app, users can install your PWA on their devices. Each PWA comes with a JSON file called the app manifest. That specifies the icon, the app URL, and other associated data meaning that the user experience is nearly indistinguishable from a regular mobile app.

Business Benefits of PWAs

From a development perspective, the benefits of a single codebase using standard web tooling are clear. But how do they help with user engagement and ROI?

Discoverability
Remember that PWAs are just web apps? As such, search engines index them just like any other website. With Google's commitment to mobile-first indexing, PWAs rank higher and are commonly seen as snippet cards at the top of the first results page.

Stickiness
Once installed, PWAs become available on a device's home screen just like any other app. Think of it as a portable web page that's accessible with a single click or tap, without the user having to open the browser first.
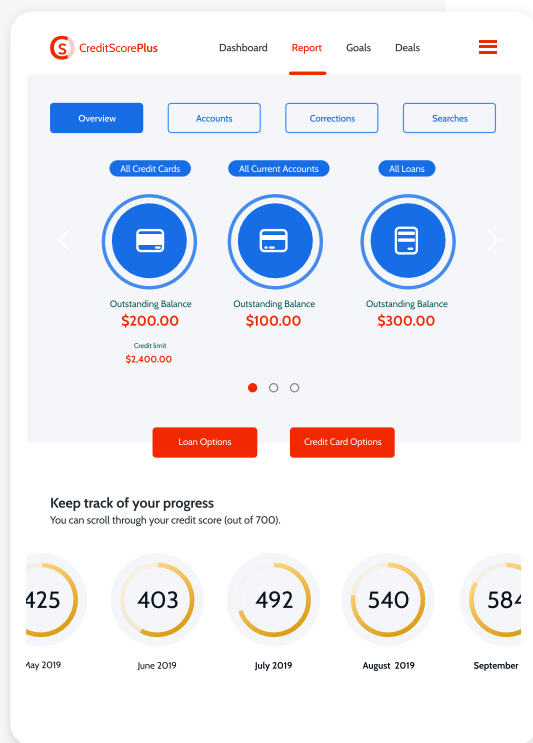
High performance
According to a recent study by Google, 53% of users abandon mobile websites that take more than three seconds to load,[1] so speed is critical to adoption. Since PWAs work offline first they load and run faster.

Always up to date
PWAs are always fresh. Each time a user connects to the server, the app can update automatically over-the-air, with no need for manual user approval.

[1] https://www.thinkwithgoogle.com/consumer-insights/consumer-trends/mobile-site-load-time-statistics

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Responsiveness

PWAs are responsive by nature. They adapt to any screen size, and their behavior will be consistent regardless of device.
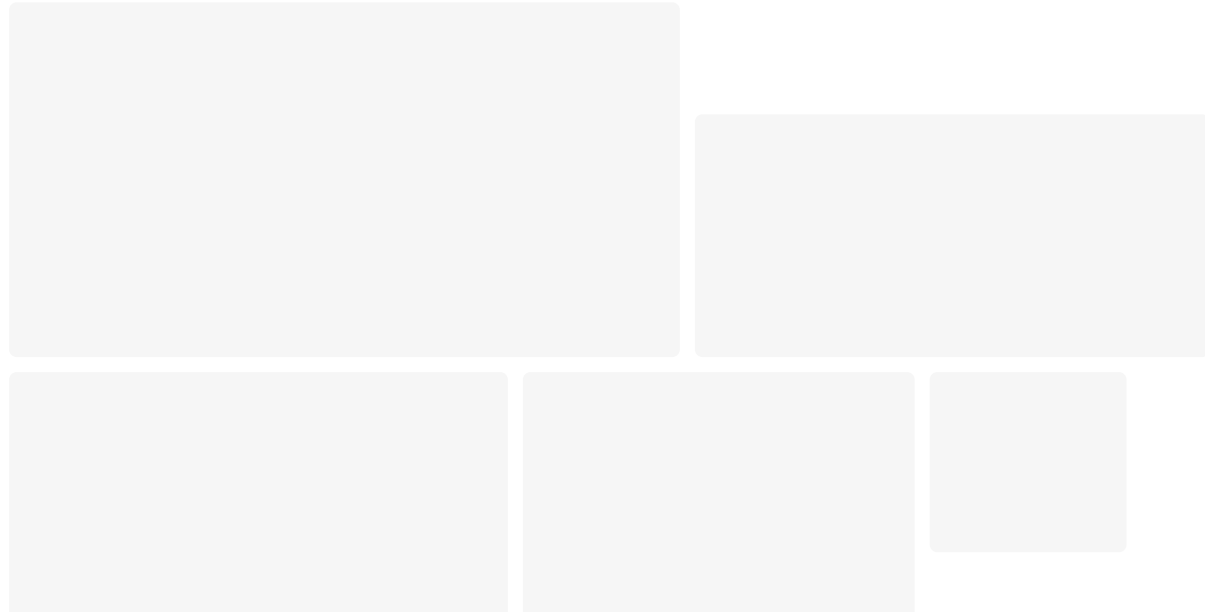
Shareability

PWAs can be easily shared and used via a link that doesn't require a visit to the app marketplace or a lengthy download. Furthermore, when Android users can share links to PWAs with iOS users, they don't need to distinguish the store being used to download the app.
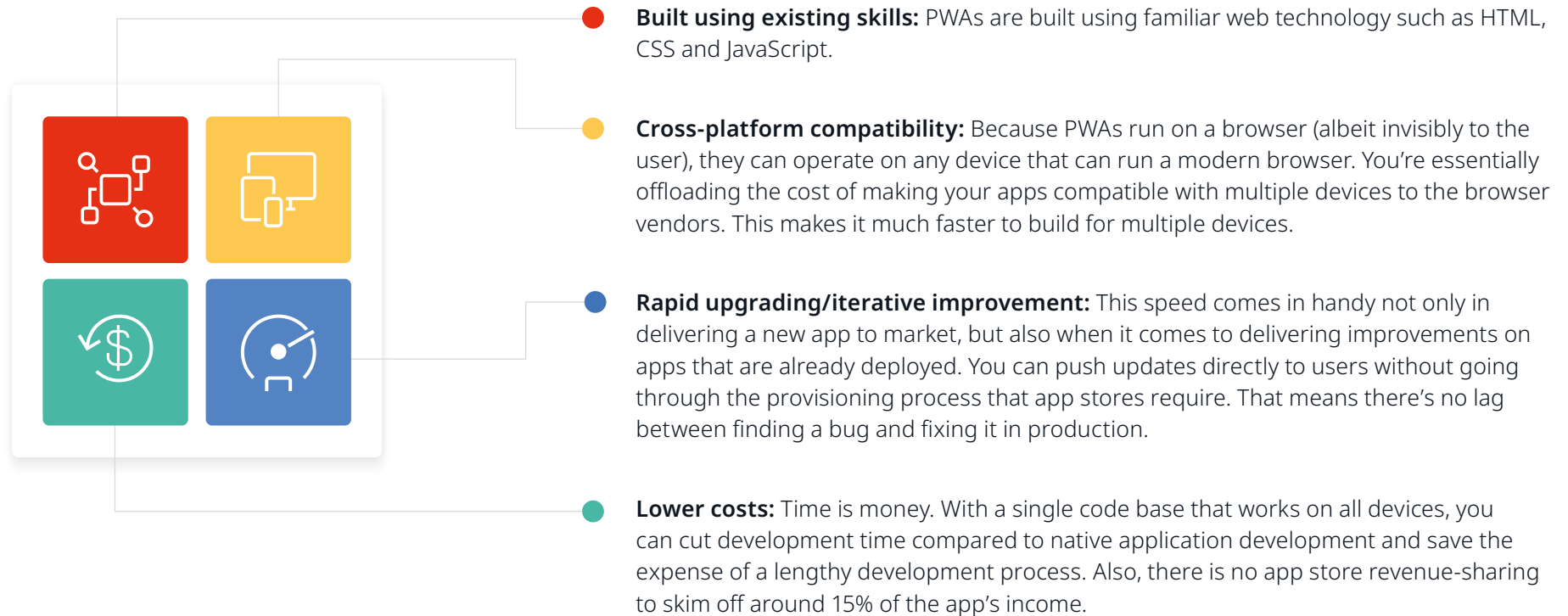
Native device capabilities

Just like a native app, PWAs can make use of a device's hardware features and storage. Your app can also allow users to make payments through built-in payment systems such as Apple Pay or Google Pay.

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Advantages of PWAs

PWAs help speed your time to value with a shared code base between platforms and the ability to deploy without going through an app store.

Built using existing skills: PWAs are built using familiar web technology such as HTML, CSS and JavaScript.

Cross-platform compatibility: Because PWAs run on a browser (albeit invisibly to the user), they can operate on any device that can run a modern browser. You're essentially offloading the cost of making your apps compatible with multiple devices to the browser vendors. This makes it much faster to build for multiple devices.

Rapid upgrading/iterative improvement: This speed comes in handy not only in delivering a new app to market, but also when it comes to delivering improvements on apps that are already deployed. You can push updates directly to users without going through the provisioning process that app stores require. That means there's no lag between finding a bug and fixing it in production.

Lower costs: Time is money. With a single code base that works on all devices, you can cut development time compared to native application development and save the expense of a lengthy development process. Also, there is no app store revenue-sharing to skim off around 15% of the app's income.

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[2] https://www.pocketgamer.biz/comment-and-opinion/68590/why-the-7030-app-store-revenue-split-is-doomed

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PWA, web app or native app: Which to choose?

	PWA	Web app	Native app
Fast, reliable performance	✓ Yes	✗ No	✓ Yes
Multi-platform (mobile and desktop)	✓ Yes	✓ Yes	✗ No
Offline capabilities	✓ Yes	✗ No	✓ Yes
Advanced device capabilities (e.g., calendar, contacts, browser bookmarks)	✗ No	✗ No	✓ Yes
Support for demanding hardware usage (e.g., fingerprint or face identification)	✗ No	✗ No	✓ Yes
Integrations with camera, GPS, etc.	✓ Yes	✗ No	✓ Yes
Push notifications	✓ Yes	✗ No	✓ Yes
Storage requirements	✓ Low	None	✗ High
Distribution without app store	✓ Yes	✓ Yes	✗ No
Discoverable online	✓ Yes	✓ Yes	✗ No
Shareable and linkable	✓ Yes	✓ Yes	✗ No

You should choose PWAs when you and your teams:

1   Continually struggle to find the resources to launch new projects and complete projects on time. PWAs are typically quicker to build than web and mobile apps, so they're a smart option for teams that need to prioritize speed.

2   Need a stepping-stone for consumers to progressively adopt your applications (browser > PWA > mobile), especially in low-loyalty parts of their customer journeys (e.g., onboarding journeys).

3   Want to increase the reach of your mobile presence by providing a lightweight version of a mobile application to cater to users with lower-end devices or who are in areas with unpredictable or low connectivity.

4   Experience common obstacles to delivering mobile applications to consumers and employees, such as app stores and lengthy approval processes.

Choose a native application if you need:

✓   Ingration with certain device capabilities, such as calendars, contacts, browser bookmarks, alarms or other applications.

✓   The ability to intercept SMS messages or calls or obtain users' phone numbers.

✓   Demanding hardware usage such as fingerprint or facial recognition.

✓   The ability to launch without an internet connection.

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How OutSystems Accelerates PWA Development

If you choose to build a PWA, there are a number of advantages to doing so with OutSystems. Once you've created a mobile app using our rapid, intuitive visual development tool, you can distribute it as a PWA with a single toggle, so you can spend more of your time bringing greater value to users and less time repeating code.

No additional knowledge required

With the ability to create a reactive web app or mobile app using OutSystems, you have all the tools that you need to create a PWA right now. OutSystems takes care of the manifests and service workers necessary to create the PWA automatically.

Single code base

OutSystems lets you create the UI and front-end code for your mobile apps and PWAs once. You can engage customers and employees through web, mobile and progressive web apps without adapting the code for each device you want to support.

Data sync framework

Keeping local and server data in sync is no small task. OutSystems provides a framework for syncing data between your PWA and the server.

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Streamlined deployment

OutSystems allows customers to deploy PWAs with a toggle. The platform automatically generates all the resources needed for PWA deployment — metatags, app manifest, service workers and offline capabilities — without developer intervention. OutSystems is the only application development platform that does not require any specific code configuration to deploy a PWA. Most competing solutions require developers to manually create these assets and upload them to the server. What's more, our PWAs achieve the maximum score on Google Lighthouse.

Modern application platform

PWA development takes advantage of the full benefits of the OutSystems platform: a visual, model-based development platform supporting the full DevOps lifecycle. The platform provides tools that support multi-disciplinary teams who ensure your apps meet business needs as well as performance requirements.

Automated impact analysis and bug checking

OutSystems uses automation, AI and analytics to remove the guesswork and repetition from development and delivery across design, build and runtime. TrueChange checks for architecture errors and dependencies, provides governance and monitors performance in real time.

To see just how fast it is to build and deploy a PWA on the OutSystems platform, watch our demo video.

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Use Cases for PWAs

New customer onboarding

PWAs reduce the friction typical of customer onboarding because they don't require the time and additional steps of visiting an app market and downloading a new large app to their phone.

Critical aspects	• Low footprint • Push notifications

Retail loyalty programs

The large number of loyalty apps discourages users from installing all the apps on their device.

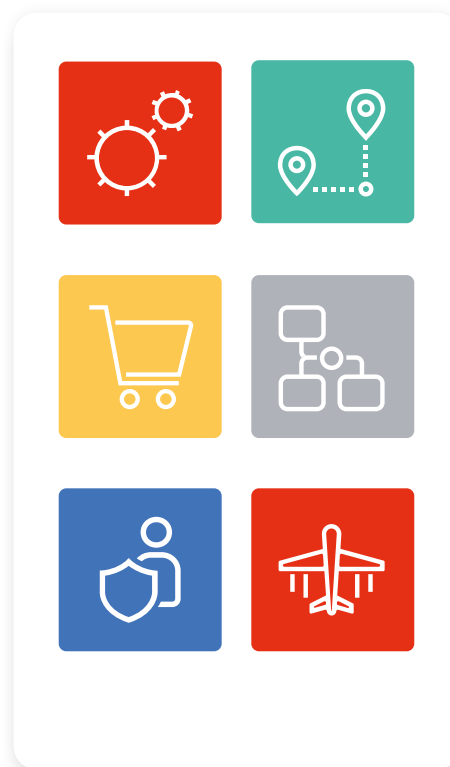| Critical aspects	• Push notifications

Insurance

Since users don't (hopefully!) have to file an insurance claim every day, there's no reason to force them into downloading a dedicated app.

Critical aspects	• Low footprint • GPS/geolocation • Camera • Push notifications

Transportation

This includes B2C apps for taxi services, rental cars, city-share bikes and public transportation. Location specificity means that visitors would prefer not to download a full-size app.

Critical aspects	• Flawless UI • GPS/geolocation • Push notifications

Workflow management

Applications that help in creating, monitoring and following processes and workflows.

Critical aspects	• Push notifications

Airline mobile apps

Users resist installing one app per airline, especially when they might be incurring roaming charges. That makes a PWA a great fit for this use case.

Critical aspects	• Low footprint, • Push notifications • Payment gateways

APP DEVELOPMENT:

2 months

RESULTS:

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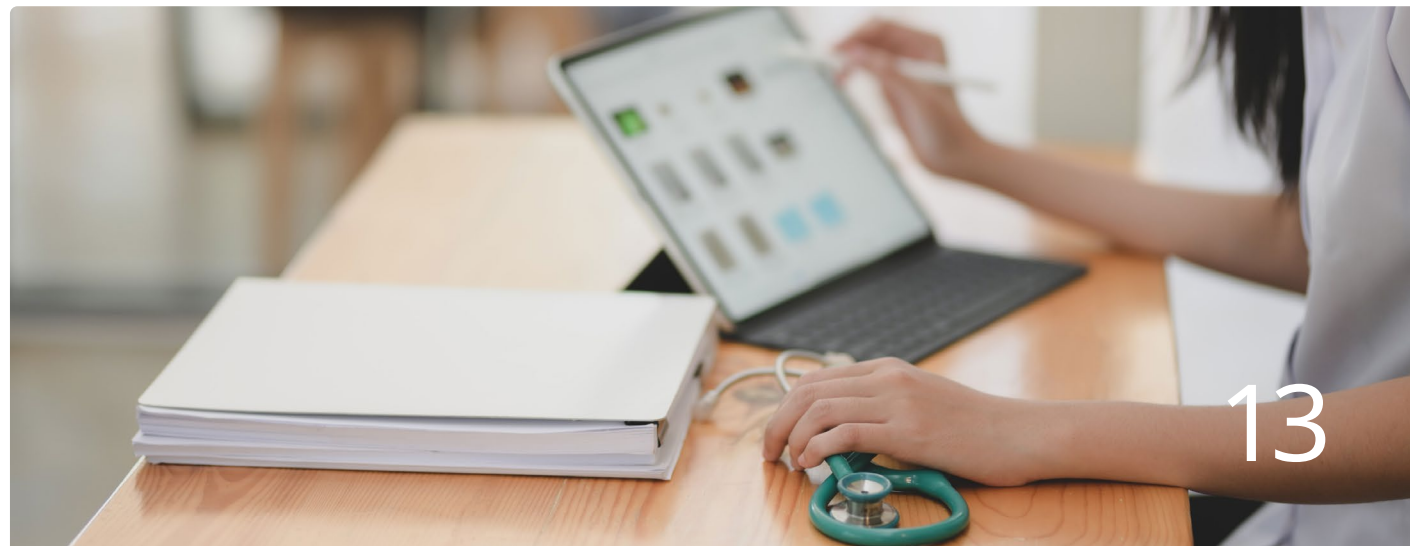
IT staff trained to use OutSystems alongside five pro developers

20

minutes admin time eliminated from every consultation call

Constellation®
Together for the common good.

Constellation is a growing portfolio of medical professional liability insurance and partner companies dedicated to reducing risk and supporting physicians and care teams. To support physicians facing lawsuits — something many will deal with at least once during their careers — Constellation's clinician peer support program links healthcare professionals to skilled peers who provide professional and emotional support.

Previously, this involved numerous time-consuming manual processes: emails, text messages and voicemails to schedule a consultation and follow-ups, and handle documentation, timekeeping, invoicing and more. Using OutSystems, Constellation built a progressive web app in just two months to streamline the peer support program's communications, time-tracking and compensation processes. Apart from saving valuable time for clinicians, Constellation has grown its app dev team from five to 20, with other IT staff learning to use OutSystems alongside five professional developers.

Read more about how Constellation built an integrated app in just two months.

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Progressive web applications give developers a new tool to interact with internal and external users without the friction they may encounter with native apps. By combining thediscoverability of web apps with the convenience and persistence of native applications, PWAs can increase adoption, engagement and conversions while also reducing the time and expense required to bring a new application to market.

[Get started for free today](#), and see how fast it is to create PWAs for your organization.