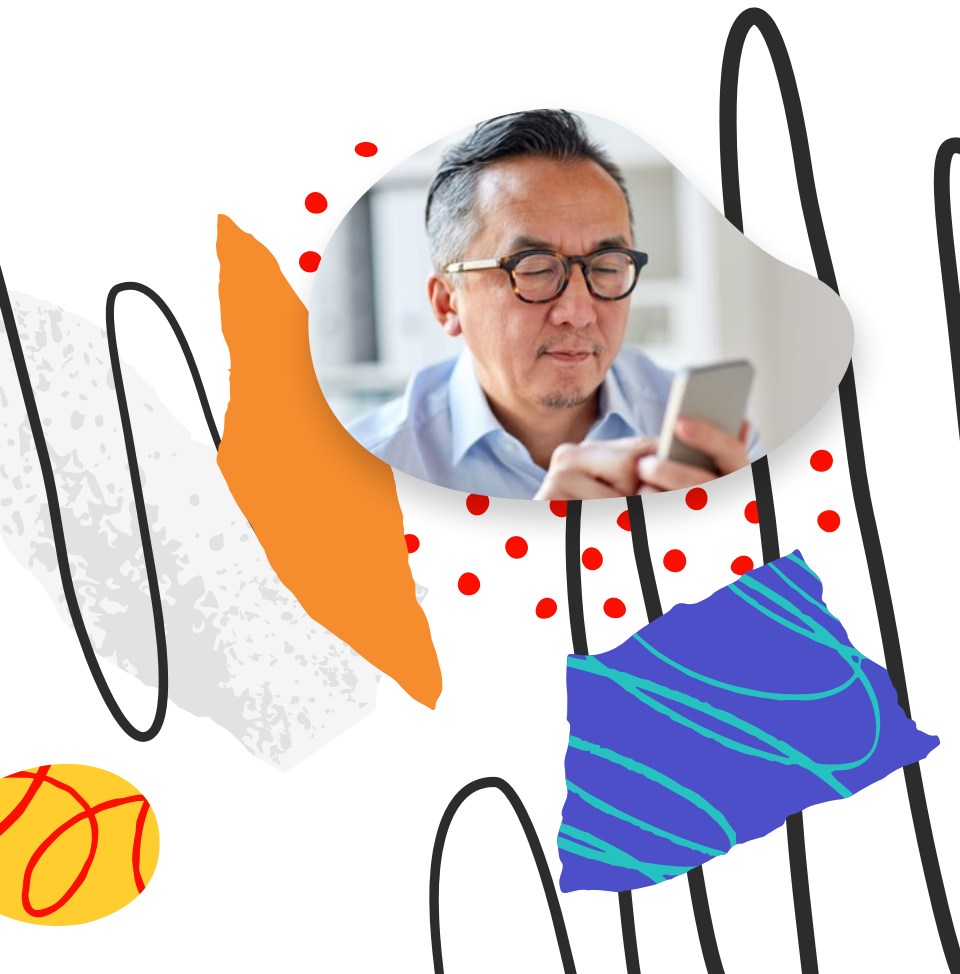
Magento Commerce

Adobe

Progressive Web App Primer for Modernizing Merchants



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Introduction

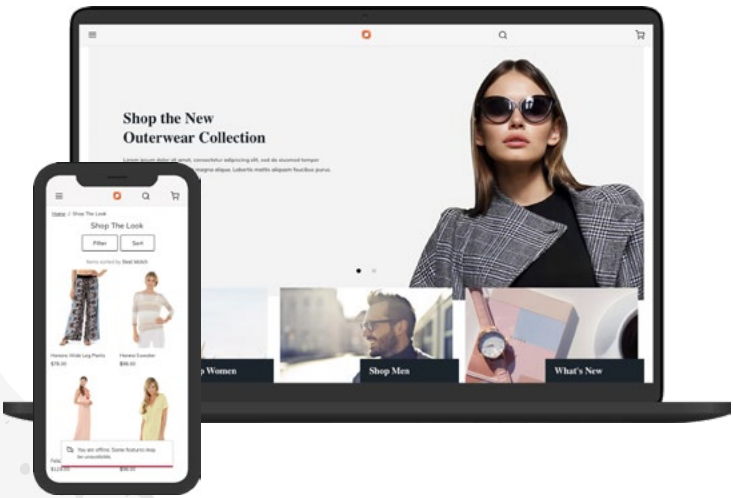
With the emergence of next-generation smartphones and handheld devices in the late 2000's, eCommerce broke free from the desktop. Complimented by technologies including responsive web design and native apps, mobile commerce—or 'mCommerce'—was soon embraced by consumers on a global scale. This technological revolution resulted in a dramatic transformation of traditional business models within a very short time.

Today, mCommerce is a daily fixture in the lives of millions, and yet today's most prevalent mobile experience technologies are limited in scope. Slow speeds, subpar user experiences, and dated functionality have prevented businesses from tapping mobile's full potential. In a time when consumers demand digital commerce experiences which are seamless and ultra-fast, yesterday's technologies are at a disadvantage. However, a powerful solution exists in the form of progressive web apps.

PWA

Progressive web app (PWA) technology helps merchants deliver an eCommerce experience which meets the expectations of today's digital, mobile-first consumers. PWAs offer an app-like, browser-based mobile environment which functions faster and more reliably than existing solutions. And with lowered development and deployment costs, it's no surprise PWA technology continues to be enthusiastically adopted by businesses of all types.

This educational primer explains the essentials of progressive web apps and how this emergent technology is actively transforming how merchants are shaping the mobile commerce experience.



The Mobile Experience Potential

Whether your business is B2C or B2B, mobile commerce matters. Nearly everyone owns a smartphone, creating a vast digital marketspace brimming with potential. mCommerce is an ultra-convenient channel for individuals to complete on-demand transactions with just a few screen taps on their smart device screen. Unlike the days of desktop eCommerce, brands can now reach their customers on their mobile devices anywhere, anytime.

mCommerce is swiftly overtaking all other forms of digital commerce. 2020 research from Statista reveals mobile now accounts for approximately half of global web traffic. In the fourth quarter of 2019, mobile devices—excluding tablets—generated 52.6 percent of global website traffic, consistently hovering around the 50 percent mark since the beginning of 2017[1]. Internationally, many emerging digital markets are developing almost entirely on mobile devices, sidestepping the desktop internet phase altogether.

$418.9B

U.S. mobile commerce is projected to increase from $128.4 billion to $418.9 billion through 2024[2]

$339B

In 2020, U.S. mobile retail revenues are expected to amount to $339 billion, up from $207 billion in 2018[3]

$142.5B

People spent $142.5 billion during the 2019 holiday season, up 13.1 percent year-over-year with smartphones driving 84 percent[4]

> Mobile ate the desktop back in October 2016.
>
> **Aaron Gustafson**
> Web Standards and Accessibility Advocate
> Microsoft

Mobile's Current Limitations

The majority of mobile commerce experiences are driven by either responsive web design (RWD) or native apps. Both technologies were developed in response to the impracticality of replicating desktop browser environments on a mobile scale. However, the needs of today's mobile-savvy consumers are straining the capabilities of these once dominant digital solutions.

Native Apps

Native apps are purpose-built smartphone applications installed on a user's device through an application store, such as Apple's App Store. According to Statista, over 2 million apps are available for download on the Google Play store, while 1.83 million apps are available on the Apple App Store as of 2019[5]. Along with their simplified interface, native apps enhance the user experience by tapping a devices features like the camera, microphone, and GPS.

Experience Limitations

Time Consuming Downloads

Native apps require an initial time investment to load and use on a device. 50 percent[6] of smartphone users prefer a mobile site because they don't want to download an app.

Data Consumption

If WIFI is not available, native apps require cellular data for download. Data is also required for most apps when they're running in the background. For example, your typical weather app needs background data running to ensure a continually updated forecast.

Costly Development

Development and maintenance of a native app can be costly, especially if compatibility across multiple platforms and mobile devices is required. The average development cost is estimated at $50-100k, and up to $500k+ for enterprise-level organizations. Different platforms also require specialized technical expertise.

No Guarantee of Acceptance

Getting listed in an app store can be a long process with no guarantee of acceptance. Even if your app clears review, there's no guarantee it will catch on with users or drive traffic to your brand.

Responsive Web Design

Responsive web design (RWD) is based on a one-size-fits-all grid system. RWD scales a browsers content and associated elements to fit within the user's screen. By resizing site components in relation to one another, it delivers smoother, contextual browsing. Although RWD has helped address mobile's spatial restrictions, modern experiential demands have exposed the limitations of RWD.

Experience Limitations

It's Just Not Desktop

RWD folds down a website into a condensed form factor for mobile. Attempting to replicate your desktop browser experience on mobile is out of touch with mCommerce users who have differing expectations, interactions, and intents.

Functionality Without the Frills

RWD's web-based orientation does not allow it to utilize smartphone features which enhance the overall customer experience. These include essentials like the camera, microphone, and GPS-based location services.

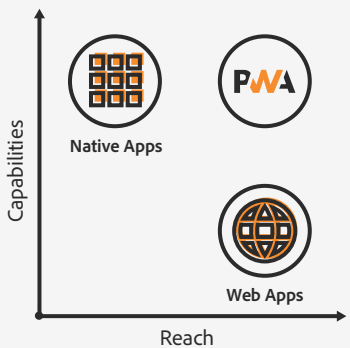
Same Code, Different Platforms, Slow Performance

RWD downloads the same code to display a site on mobile as it would on a desktop system, increasing load times. Multiple studies have shown mobile sites with longer load times have higher bounce rates, negatively affecting conversions.

Progressive Web Apps Transform the Mobile Experience

Consumers are ready for a next-generation answer to the mobile engagement question.

The answer is Progressive Web Apps (PWA), a browser-based application software constructed and delivered via the web using an app-like interface.



Progressive web apps (PWA) represent a significant advance in the evolution of the mobile web, similar in scale to the transition from conventional desktop sites to responsive web design. PWAs blur the lines between mobile apps and sites by equipping merchants and developers with a highly flexible web architecture.

PWAs are capable of seamless, cross-device functionality while 'progressively' utilizing native platform features to enhance the user experience.

Bridging the gap between mobile apps and mobile sites, PWAs deliver faster performance, reliable connectivity, and fluid site navigation. These and other benefits are proven to invigorate user engagement, drive conversions, boost average order value, and accelerate revenue growth.

Experience Enhancing Power

Inviting Interface
PWAs present only the most essential user content, supplemented by smooth animations, fluid page scrolling, and intuitive navigation experiences. This mobile-first visual environment encourages user engagement and active site exploration.

Fast, Responsive Browsing
With PWAs, pages load incredibly fast with quick transitions, eliminating awkward rendering and sluggish page loads. The average load time for PWAs is just 2.75 seconds, eight times faster than the average mobile landing page.

The Magic of Service Workers
PWAs are enabled by service workers, a script your browser runs in the background to intercept network requests and store data locally. This delivers secure, offline browsing during lapses in network connectivity, reducing dependence on internet connections.

Support for Emerging Markets
PWAs are mindful of low bandwidth and limited data plans while delivering consistent functionality regardless of unreliable networks. This benefits individuals in emerging mobile markets where data is at a premium.

Low Data Commitment
PWAs use a fraction of mobile data compared to native apps, recognizing individuals operating on limited cellular data plans. They also have minimal storage requirements, ensuring they perform consistently across a range of devices.

Ditch the Download
PWAs are right at the user's fingertips via their web browser without the need to download or install a separate app. When installed, PWAs run in their own independent window and launched from the user's home screen, dock, or taskbar.

No Updates, No Problem
PWAs actively update themselves in real time like a website. This eliminates the need for periodic updates from an app store.

Browsers Love PWAs
PWAs are supported by modern web browsers for iOS and Android, including Firefox, Chrome, and Safari.

Benefits to Merchants

Increase Average Order Value
User-friendly layouts and navigation helps shoppers quickly browse products and services. This motivates your customers to add additional items to their cart prior to checkout, increasing average order value.

Save Development Time and Resources
By developing on a single codebase for all mobile and desktop devices, PWAs cost significantly less to develop and deploy compared to a native app. As PWA development standards are refined, the TCO and time to market will continue decreasing.

Freedom to Deploy
PWAs enjoy unrestricted, flexible distribution since they do not need to be listed in an app store. This means freedom from the restrictive terms of service and revenue share agreements imposed by these entities.

Discoverability
Once your PWA is built, anyone can access it through a browser interface they're familiar with. As opposed to the gatekeeper element of an app store with app rankings and searching, PWAs show up in Google search results as any web page would.

PWAs Attract Top Front-end Talent
PWAs are a new frontier in technological innovation, drawing the talents of qualified UX and front-end developers. These individuals are attracted to emerging web technologies, and PWAs offer opportunities for skills acquisition and career development.

PWAs—More Than Just a Mobile Marvel

Many of the benefits of PWA, from super-fast page speeds to automatic updates, also carry over to desktop and other devices. PWAs can even be installed on a desktop just like a native app—but they'll be faster, more reliable, and take up much less space on a users preferred device.

The Progressive Future of Retail

PWAs could replace legacy point of sale systems and retail associate platforms as part of the in-store experience. This will create an efficient, cost-effective way for store associates to locate products online and in-store, provide self-checkout, service returns, and more—all from an employee's smartphone.

The Proof Is in the Numbers

As a pioneer of PWA technology, Google has compiled a wealth of data[7] supporting their effectiveness:

- The average bounce rate of a PWA is **42.86 percent lower** than a similar mobile website
- Mobile sessions on PWAs are **increased by nearly 80 percent**
- Overall engagement is 137 percent higher, with some brands having boosted engagement even higher
- The average load time for PWAs is just 2.75 seconds, eight times faster than an average mobile landing page

> PWAs represent a seismic advancement in the evolution of the mobile web, similar in magnitude to the transition that happened five years ago from conventional desktop sites to responsive web design.

Peter Sheldon
Senior Director Commerce Strategy
Adobe

Embracing the Mobile Moment

As progressive web apps reimagine mobile commerce, consumer brands, industry wholesalers, and media providers alike are recognizing the technology's potential. With PWAs combining the best features of mobile web and native apps, a brand's mobile audience can grow exponentially—at a fraction of the costs associated with native apps. Early adopters are discovering PWAs deliver significant returns against the initial cost of development and deployment.

- The Twitter Lite PWA generated a **65 percent increase in pages per session**, **75 percent more Tweets**, and a **20 percent decrease in bounce rate**
- After switching to a PWA, Nikkei saw **2.3 times more organic traffic**, **58 percent more subscriptions**, and **49 percent more daily active users**
- Hulu replaced their native desktop experience with a progressive web app and saw a **27 percent increase in return visits**
- Tinder's PWA experience, Tinder Online, means users can now access the popular digital dating service from **either mobile or desktop devices**, expanding the targetable market
- After launching their PWA, the Washington Post **improved their page load times by 88 percent** versus conventional mobile web

A Who's Who of PWA Pioneers

The list of mobile commerce innovators who either have PWAs deployed or currently in development continues growing across a diverse range of industries.

- Instagram
- BMW
- Tinder
- Starbucks
- Twitter
- The Washington Post
- Facebook
- Uber
- Pinterest
- Forbes
- The Weather Channel
- Lyft

50%

of all consumer-facing native apps in 2020 will be replaced by PWAs, according to Gartner Research[8].

> PWA Studio is positioned to lower the cost and complexity of adopting Progressive Web App experiences.
>
> **Forrester Wave™: B2C and B2B Commerce Suites**

PWA Studio in Magento Commerce

The Magento PWA Studio is a developer-centric platform helping Magento Commerce solution partners and UX developers deliver next-generation mobile experiences. PWA Studio comprises a rich suite of tools for building online stores with app-like shopping environments. This helps merchants solve the mobile conversion dilemma while creating highly personalized commerce experiences.

Core features of the Magento Commerce PWA Studio include:

- Tools to personalize content and add local preferences
- The ability to build and manage all channels and experiences via one code base, one deployment, and one app
- An intuitive, marketer-friendly user experience with integrated Page Builder content management capabilities
- Modularized component architecture and extensibility framework to grow opportunities for extension resellers

- Purpose-built developer tools for fast prototyping, helpful debugging, rich feedback, and increased productivity
- The Venia reference storefront, which accelerates time to market with pre-built UI and style components from home page to checkout

> PWA Studio is an amazing toolset which helps you create PWAs without having to do the heavy lifting yourself.
>
> **Jordan Eisenburger**
> PWA Tech Lead
> Experius

The Magento Commerce approach with PWA Studio as an open source project on GitHub allows development teams to familiarize themselves with additional resources and required technology.

Getting familiar with any new framework takes time, and PWA Studio was built with the developer experience in mind. It lowers the barrier to entry with robust developer tooling, extensive documentation, and user tutorials to get started.

Mobile Sites Reimagined with PWA Studio in Magento Commerce

Whether you're a B2C or B2B business, Magento PWA Studio can go to work for you. The following case studies provide examples of how a PWA experience investment can deliver significant returns.

Eleganza

Transforming mobile shopping with PWA Studio.
Eleganza is a well-known, high-end fashion retailer in the Netherlands, selling brands such as Versace, Michael Kors, and Valentino. With the end of life for Magento Commerce 1 approaching, Eleganza saw an opportunity to transform its mobile commerce experience and take the lead in their market by embracing PWA technology with Magento Commerce 2. With help from Magento Solutions Partner Experius, the push to future-proof the look and feel of their digital commerce environment began.

> We look forward to realizing additional value in the future as PWA not only brings us to the forefront of our market but keeps us there for years to come.
>
> **Guus van der Staak**
> eCommerce Manager
> Eleganza

The Results

Using Magento Commerce PWA Studio, the Eleganza PWA delivers an app-like shopping environment focusing on ease of use. Features such as horizontal scrolling and streamlined navigation eliminate the need for the standard 'back' button which defines most browser experiences. Eleganza also enhanced several ordering options and integrations with local payment solutions to enable a true omnichannel experience.

76%
increase in page views per session

23%
average page load time

372%
faster average server reaction time

Selco Builders Warehouse

From brick and mortar retailer to digital trailblazer.

Selco, the UK's fastest growing builder's warehouse, supplies a vast catalogue of 15,000 different materials to tradespeople and construction companies. Having outgrown their existing commerce platform, Selco partnered with JH, a Magento Commerce Enterprise Solution Partner to initiate their upgrade to Magento Commerce 2. This would position Selco to develop a modernized mobile commerce experience using PWA Studio.

300%
faster than their previous platform

82%
revenue increase

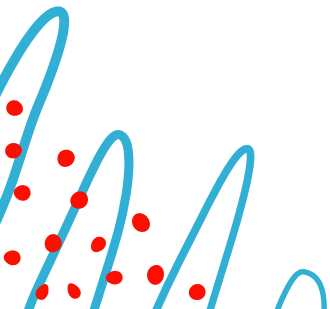
94%
increase in transactions

The Results

Working with JH, Selco is now one of the first B2B merchants to launch a mobile experience using PWA Studio. The results have grown a huge competitive advantage in their market due to improved site speed and multiple enhancements to the user experience.

> The latest update to Selco's website is the first ever progressive web app to be deployed for a B2B merchant on the Magento Commerce platform.

Jamie Huskinsson
CEO and Founder,
JH



Considerations for Progressive Web App Adoption

As PWAs continue gaining traction, early adopters put themselves at an advantage over their competitors. However, as with any technology integration, careful assessment of business objectives and available resources must be made prior to moving forward.

Is Your Site Due for a Refresh?
Walk through your site to see whether it's ready for a front-end refresh. Does your site readily communicate its purpose? How does the site view across various platforms and browsers? Is it easy to navigate? Is content presented in a clean, straightforward manner?

Is Traffic Dictating Demand?
Your mobile sales and traffic numbers can help gauge whether or not to push towards a mobile makeover. If more than 50 percent of web traffic or more than 25 percent of online orders come from mobile, you have the numbers in place to start developing a PWA.

Is PWA Development in Your Budget?

Overall cost for a PWA with Magento Commerce will vary based on development time and complexity of your current commerce platform. As more Magento Commerce storefronts are created using PWA, including Marketplace-ready extensions, the overall cost of development will reduce significantly.

Can I Divert App Development Budget and/or Resources to PWA?

If initiating PWA development is a stretch for your budget, take a look at projects you have underway. If you have a native app currently in development, consider redirecting a portion of its budget and resources towards a PWA instead.

Conclusion

PWAs are a significant push forward in the ongoing evolution of mCommerce. The technology blurs the lines between native apps and mobile sites by equipping merchants and developers with the ability to build app-like shopping directly in the browser. Given their power, speed, and flexibility, it's difficult to imagine a digital commerce experience which cannot be improved upon using PWA technology—including yours.

Citations

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