The Enterprise Guide to Delivering Commerce Progressive Web Apps

How to deliver high-performing PWAs and unlock agility at the same time.

Mobify

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TL;DR

This guide outlines how to best deliver a Progressive Web App (PWA) based on your organization's ecommerce architecture and strategic objectives.

Many retailers and brands today deliver their front-end experience through an ecommerce platform or content management system (CMS). In these environments, you could quickly launch a PWA experience on mobile and/or tablet and get the associated revenue boost on those channels.

Those looking for a more strategic front-end investment should deliver a PWA through an API-led approach. With an API-friendly Front-end as a Service, you can equally expose both the ecommerce platform and CMS, and get a complete front-end PWA across mobile, tablet, and desktop. Separating the front-end experience from the backend systems increases agility and future-proofs your front-end investments.

There's also the option to do a hybrid approach if your organization isn't ready to go down the API route just yet. Keep reading to determine the best fit for your business!

Google is driving the development of modern web technologies like Progressive Web Apps (PWA) and Accelerated Mobile Pages (AMP) to help retailers gain a competitive advantage through better, faster online experiences. However, implementing a successful commerce PWA is easier said than done. You probably already know **what** a PWA is and **why** you need one, so this guide focuses on **how** to deliver a high-performing enterprise PWA and unlock agility at the same time.

Commerce Progressive Web Apps Are On the Rise

PWA adoption in commerce is steadily rising, with 2019 poised to be a year of explosive growth for the web technology. Jason Goldberg, who leads the commerce and content practice team at Sapient Razorfish, said PWAs are one of the top retail trends poised to gain traction in 2019[1].

PWAs bring the fast, engaging experience of a native app to a broader audience on the web. This leads to faster performance, more revenue, better SEO, and a superior customer experience. A PWA can even be enhanced with AMP pages to make the initial discovery lightning fast.

1. https://nrf.com/blog/retail-trends-will-gain-traction-2019

The 3 Approaches to Delivering Commerce PWAs

There are 3 different approaches to delivering front-end experiences, as outlined by Gartner Research below. As retailers and brands plan to build commerce PWAs, they should evaluate which approach aligns best with their strategic business objectives.

THE THREE APPROACHES TO COMMERCE ARCHITECTURE
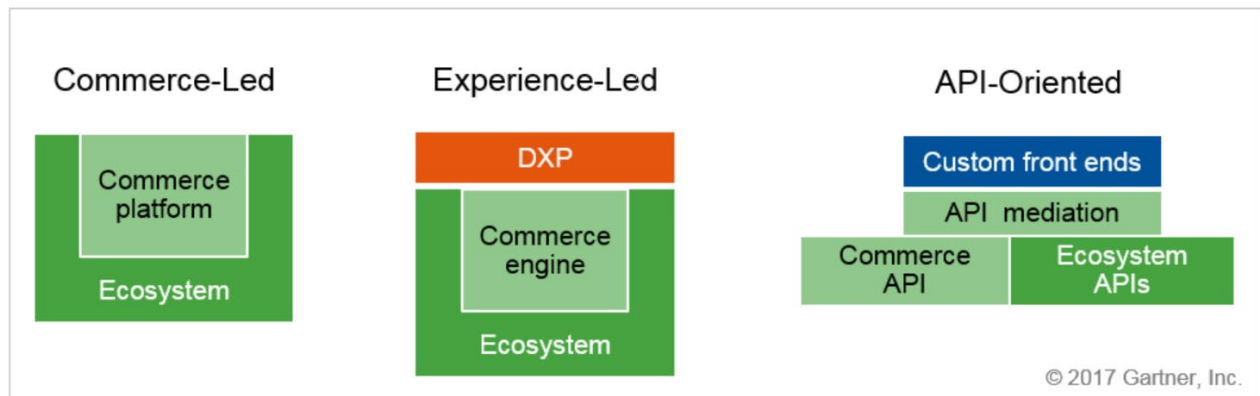
Source: Gartner (September 2017)   2

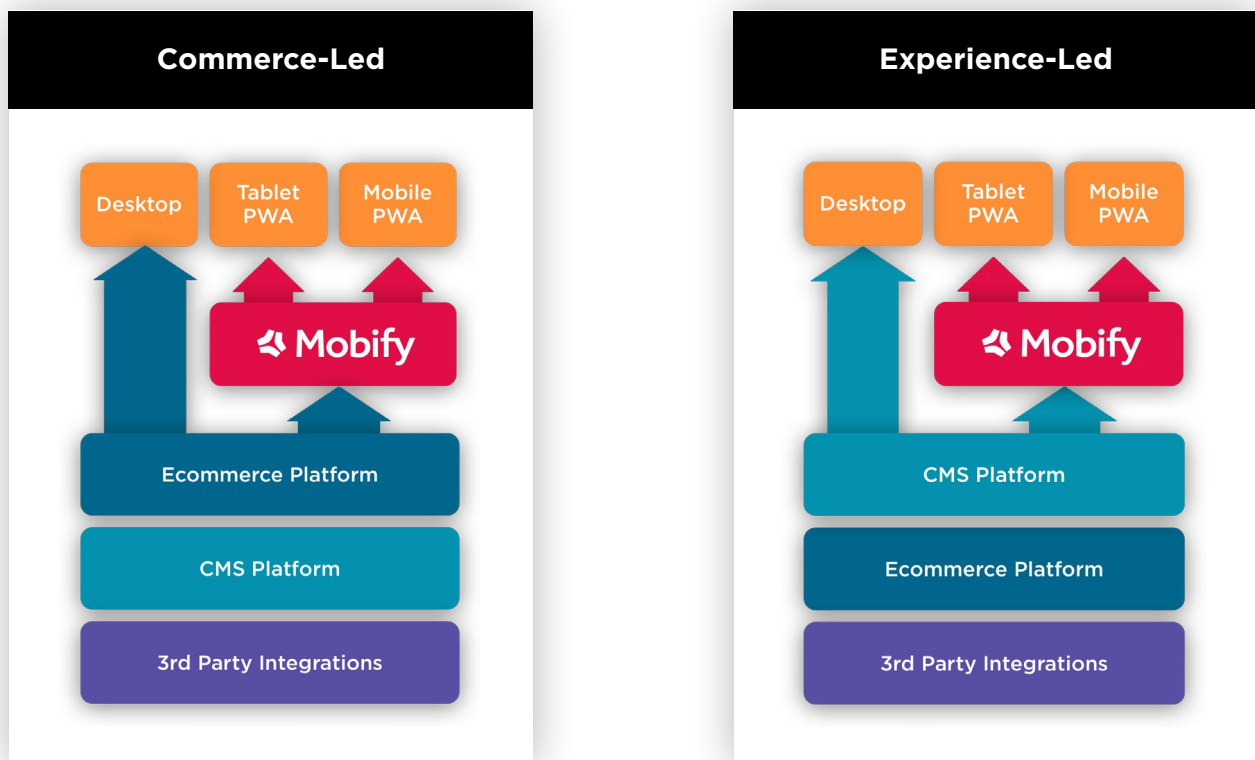| Commerce-Led	Experience-Led	API-Led
The ecommerce platform is the front-end experience.	The web content management system (CMS) is the front-end experience.	A custom front-end, vertically integrated reference storefront, or a Front-end as a Service integrate with APIs to equally expose both the ecommerce platform and CMS.

2. Source: Gartner (Refreshed 14 May 2018, Published 28 September 2017) The Three Approaches to Digital Commerce Platform Architecture and How to Choose Among Them, Refreshed 14 May 2018, Published 28 September 2017. Figure 1. The Three Approaches to Commerce Architecture

The Current State: Commerce-Led & Experience-Led Approaches

Most retailers today manage their digital experiences with a **commerce-led** or **experience-led** approach. In other words, the front-end experience is built within either the CMS or ecommerce platform, so it's tightly coupled to the backend.

The Perks of Delivering a Mobile PWA in this Environment

Delivering a PWA in this environment would mean focusing on the mobile and/or tablet experience, and continuing to deliver the desktop experience from the CMS or ecommerce platform. A PWA would use existing APIs or convert HTML into an API to pull content from the underlying CMS or ecommerce platform into a PWA experience on mobile and tablet. The advantage with this approach is that you can get a PWA to market very quickly on your highest traffic channel.

Commerce-Led

Desktop | Tablet PWA | Mobile PWA

Mobify

Ecommerce Platform

CMS Platform

3rd Party Integrations

Experience-Led

Desktop | Tablet PWA | Mobile PWA

Mobify

CMS Platform

Ecommerce Platform

3rd Party Integrations

Both these approaches are a good fit for retailers who want to create a better mobile experience and generate a quick revenue boost. However, there are two things to be conscious of: future-proofing and agility.

Front-End Investments Aren't Future-Proofed

Most retailers replatform every 3-5 years, and with a tightly coupled approach, they will lose any previous front-end investments when they do so. The desktop experience wouldn't be future-proofed with a commerce-led or experience-led approach, however the mobile and tablet PWA could be with the right API strategy.

Teams Can't Be Agile

The fast rate at which new web technology emerges and customer expectations change demands retailers focus on agility. Unfortunately, a coupled architecture inhibits frequent testing and deployments at scale because a user experience (UX) change requires a heavy redeploy of the CMS or ecommerce platform.

Some may perceive an experience-led approach as more agile because it enables fast changes to certain parts of the experience – copy, images, video – but retailers still can't make UX changes quickly or easily. The goal should be to unlock the entire team to make larger experience changes beyond just copy and content.

## When to Choose a Commerce-Led or Experience-Led Approach to Delivering PWAs

If your organization's goal is to quickly deliver a better mobile experience and the associated revenue boost, then delivering a PWA in a commerce-led or experience-led environment might be the right fit for you. This can also be a great first step to moving towards an API-led approach down the road.

Advantages	Disadvantages
• Fast time to market • Quick mobile revenue boost • Better experience on highest traffic channel • Good first step towards API-led approach	• Doesn't fully unlock agility • Front-end investments not future-proofed • Duplicate front-end codebases to manage

If agility and future-proofing are important to your organization, then you should evaluate an API-led approach. This would unlock agility and ensure you don't need to start from scratch when the next-generation of web technology emerges or business needs dictate the replacement of a backend system.

The Future: API-Led Approach

Retailers have complicated IT ecosystems – layers of systems from different vendors with legacies spanning years. To provide a customer-first experience, retailers must connect all of these systems to a new API-driven front-end that equally exposes both the ecommerce platform and the CMS. An API-led approach enables a customer-first strategy.
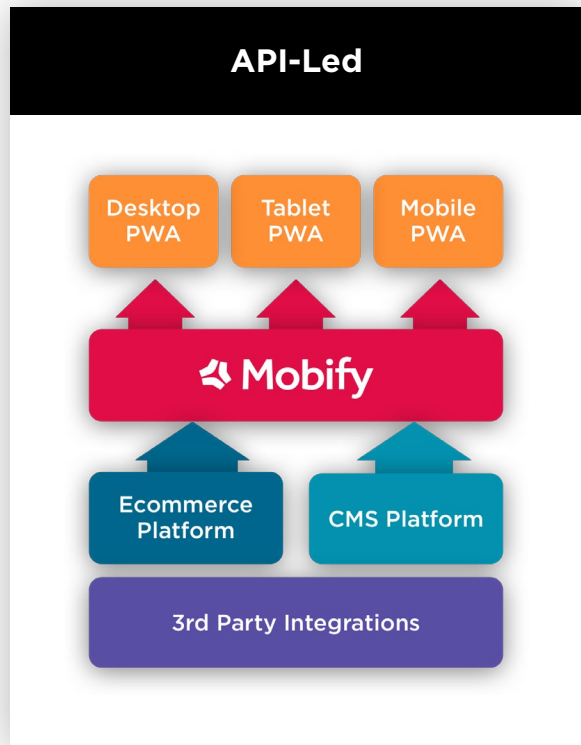
> "Retailers and brands shouldn't be delivering PWAs the same way they've delivered front-end experiences in the past."
>
> **DANIEL AN,**
> **GLOBAL PRODUCT LEAD,**
> **MOBILE WEB, GOOGLE**

Unlock Agility and Future-Proof Investments

Using an API-led approach provides a clean separation between the customer-facing experience and all the backend business logic to unlock agility across the organization.

The separation between the front-end and backend:

- **Future-proofs front-end investments:** You won't have to throw out the front-end when when it comes time to replatform because it won't be coupled to the backend.
- **Enables frequent UX testing and deployments:** The deployments are smaller and less risky, which allows you to experiment often and drive incremental value quickly.
- **Facilitates a mature agile organization:** Front-end teams are empowered to make UX changes without having to go back to a central IT team.

APIs Lead to High-Performing PWAs

The cornerstone of PWAs is speed. They significantly lower the time it takes for a shopper to complete critical tasks like finding an item or completing a purchase – and the faster a shopper can complete a purchase, the more likely they are to buy. Google research found that as page load time goes from 1 second to 10 seconds, the probability of a mobile site visitor bouncing increases 123%.[3]

Not all PWAs are created equal when it comes to speed. An API-led approach defers and reduces the total amount of data being sent to the device to ensure the PWA is as fast as possible. For example, a Product Listing Page may only load the first 10 products, and load the remainder as you scroll down – this is the same experience you would expect out of a native app (think of Facebook or Instagram). APIs are critical to supporting this level of granularity.

> "When it comes to the user experience, performance is king. If the experience isn't fast, no other user experience features will matter. This is why, in a few years' time, no one will build commerce sites without using PWA technology."
>
> **ANDREW MOTTAZ,
> SR. DIRECTOR OF
> INTERACTIVE STRATEGY,
> ASTOUND COMMERCE**

3. https://www.thinkwithgoogle.com/marketing-resources/data-measurement/mobile-page-speed-new-industry-benchmarks/

Get a Complete Front-End PWA

An API-led approach allows retailers to deliver a complete front-end PWA across mobile, tablet, and desktop. This means there will only be one front-end codebase to maintain, shoppers will get a fast and engaging experience no matter the channel they shop on, and there will be a corresponding revenue boost across all channels.

When to Choose an API-Led Approach to Delivering PWAs

If your priority is creating a better, faster customer experience, becoming more agile, and future-proofing front-end investments, then an API-led approach is probably the ideal route for your business.

Advantages	Disadvantages
• Unlocks agility across the organization • Future-proofs front-end investments • Single front-end codebase to maintain • Revenue boost across all ecommerce channels • Fastest PWA experience	• Slower time to market (ranges depending on the solution)

The time to market with this approach would vary significantly depending on which API-led solution you decide to go with. Next, we'll take a look at the different kinds of API-led solutions.

Exploring API-Led Solutions for Delivering PWAs

There are a few ways you can implement an API-led solution: building a custom front-end from scratch, utilizing a vertically integrated reference storefront, or leveraging a Front-end as a Service. Let's dive into what to consider with respect to the **shopper experience, integration management, and development and operations** for each solution.

Custom Front-End

Many perceive a custom solution as the most flexible option, but in reality, most teams will spend their time building the foundation with frameworks, design systems, and components that don't directly add business value. Consider these complexities before delivering a PWA with a custom solution.

THE SHOPPER EXPERIENCE

- PWAs give you tools to be fast but they are inherently difficult to scale in terms of performance, so your team needs to have the capabilities and time to achieve optimal performance.

- The design team needs to be able to design a different set of patterns and principles to give the PWA an app-like look and feel.

- Extending to new touchpoints like AMP, native apps, or desktop – and maintaining those new touchpoints – can be a resource challenge.

"Designing for PWAs is different than designing for responsive. PWAs should have a native look and feel, which requires a different set of patterns and principles."

**DANIEL AN,
GLOBAL PRODUCT LEAD,
MOBILE WEB, GOOGLE**

INTEGRATION MANAGEMENT

- PWAs set a higher bar for the experience so the quality of integrations has to be better.

- Integrations will only get more complicated as more opportunities emerge to integrate right into the mobile operating system. Each will require the right design patterns and integration best practices to create a good experience – all of which would need to be built up from scratch with a custom solution.

- PWA analytics are similar to app analytics, which are much more complex than web analytics. It's more difficult and time consuming to set up this finer grain tracking and the integrations that connect it back to the third party vendors.

DEVELOPMENT AND OPERATIONS

- Building an enterprise commerce PWA from scratch can take 18-24 months for an experienced team.

- Launching a PWA is only 50% of the work, followed by the maintenance, evolution, and ongoing integration efforts. Building a mature DevOps practice and culture to cover this requires a major investment to:

  - Set up, maintain and improve continuous integration, continuous deployment and testing automation, as well as keep up with the latest trends, best practices, and services.

  - Continuously update the build to incorporate new APIs, and research and test how to best apply these APIs to a retail environment.

  - Deploy and scale modern front-ends globally in a repeatable manner with complex systems such as server-side rendering, caching, and data pipelines.

  - Build in resiliency and constant monitoring across DNS, CDN, and multi-region deployments, which requires experience and effort beyond using public cloud/Platform as a Service.

> "We knew if we built a PWA on our own, the technology it was built on would be outdated within a year. That's why we saw the value in building our PWA on the Mobify Platform which has ongoing innovation baked right in."
>
> **JIM HINGSTON, HEAD OF DIGITAL PRODUCT, DEBENHAMS**

Vertically Integrated Solutions

A vertically integrated solution is when a single vendor provides the backend platform, the front-end experience, and the APIs that separate the two. It could be an ecommerce platform or CMS vendor that offers the decoupled front-end.

THE SHOPPER EXPERIENCE

- By relying on a single vendor, retailers are dependent on their roadmap and the speed at which they drive innovation – and as backend experts, they won't drive the same speed of innovation on the front-end.

- The reference storefronts provided are primarily code examples and starting points, but not necessarily examples of how to create a great PWA experience.

- Outside of the code, support for pattern libraries, component libraries, performance tuning, and other levels of polish is limited, so focused effort would be needed to turn these reference storefronts into high-performing experiences.

INTEGRATION MANAGEMENT

- The assumptions of the underlying API generally lead to integrations and shopper experiences that reflect how the underlying ecommerce system works, but not how modern shoppers want it to work. As you adapt to customer-centric designs, finding a way to morph the original vendor-specific code and flow becomes more difficult.

- The reference storefronts will have limited frameworks and architecture built in for common integrations like analytics, multivariate testing, etc., so building and maintaining common ecommerce integrations will take more time.

DEVELOPMENT AND OPERATIONS

- The reference storefronts don't typically fall under the support and maintenance agreements and same level of investment, so retailers will need to set up a mature DevOps practice as outlined under the custom front-end solution above. This will require your team to invest in how to deploy, scale, monitor, debug, and patch the storefront.

- The technology stack and programming language will usually be the same as the backend. However, as more teams focus on web-centric technologies and polyglot skillsets, this no longer makes sense for agility.

- Time spent automating deployments, deploying in multiple regions, configuring CDNs, and following best practices for compliance eat away at time that could be spent innovating.
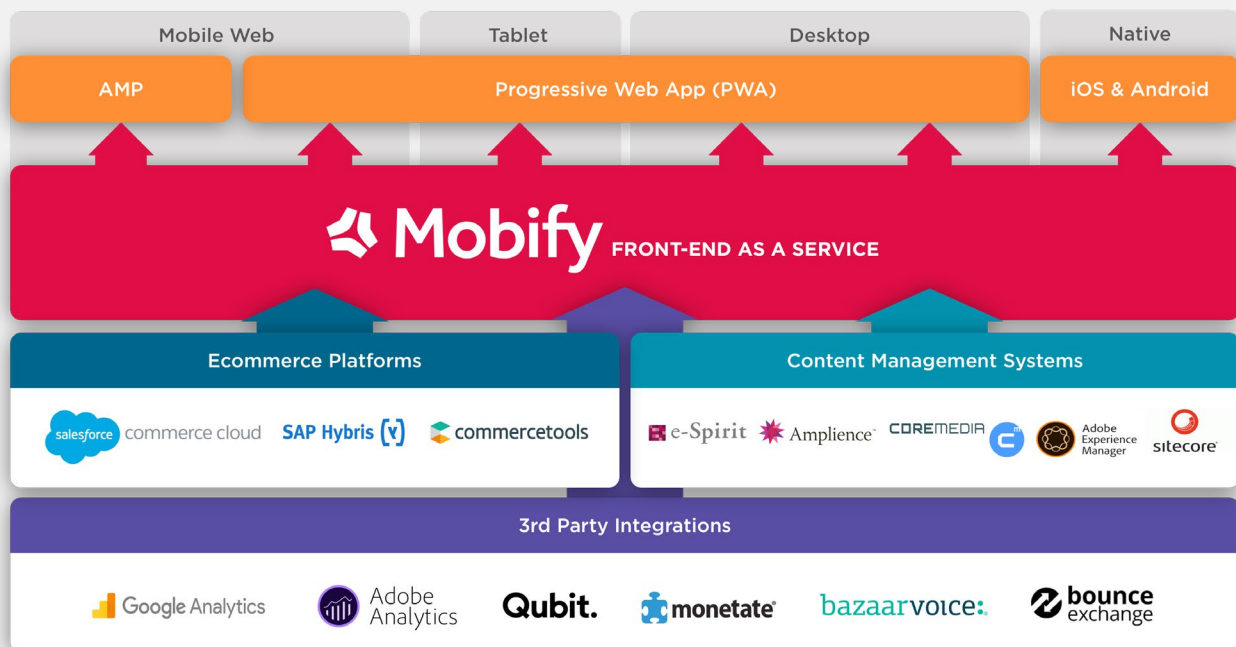
Front-end as a Service

Using a Front-end as a Service like the Mobify Platform separates the customer experience from the backend through an API layer and provides the freedom to select best-of-breed solutions throughout the entire tech stack. Since retailers aren't tied to a single, slow-moving vendor, it's easy to plug in new solutions when the old ones aren't cutting it.

> "Mobify is the only company that offers a platform to build and manage your PWA front-end as a service. The technology slashes time-to-market and minimizes maintenance expenses by building on an ever-evolving Front-end as a Service."
>
> **ANDREW MOTTAZ,**
> **SR. DIRECTOR OF INTERACTIVE STRATEGY,**
> **ASTOUND COMMERCE**

The Mobify Platform is a Front-end as a Service for building customer-first experiences through PWAs, AMP, and native apps. It sits on top of ecommerce and CMS platforms to separate the front-end and backend, providing a best-in-class PWA experience and enabling a best-of-breed approach to ecommerce.

THE SHOPPER EXPERIENCE

- The Mobify Platform powers responsively-scaled PWA experiences across mobile, tablet, and desktop so that all digital experiences are managed from a unified codebase.

- To ensure all your digital channels are covered, you can add AMP pages and wrap your PWA to publish it in the app stores.

- Single page apps became popular due to their ability to offer app-like user experiences, but a common trade-off had to be made on initial load times. Mobify PWAs minimize download and parse times with the app shell and code splitting, and combine this with server-side rendering so that an experience can be rendered quickly, while a rich application is loaded immediately in the background for the rest of the shopper journey.

INTEGRATION MANAGEMENT

- The shopper experience is decoupled from the backend through the Mobify Platform's integration layer, which sits on top of the ecommerce platform, CMS, personalization, multivariate testing, and other marketing tools.

- Certified commerce connectors and the universal connector support fast, easy integrations into any ecommerce platform, CMS, or third party software.

- The API-friendly architecture gives retailers the agility to test and deploy frequent UX changes independent of the backend, as well as add, remove, or migrate backend applications and services with reduced effort and minimal impact to the customer experience.

- The platform's data integrations route all key shopper events back to 3rd party marketing and analytics systems.

"Mobify has allowed us a lot more agility. We have seen projects, product, and new functionality go into the market way more quickly than we've ever seen before."

CHARLOTTE BURROWS, DIRECTOR OF DIGITAL, DEBENHAMS

DEVELOPMENT AND OPERATIONS

- The Mobify Platform includes modern tools and SDKs for designers and front-end engineers to rapidly develop, deploy, and evolve continuously tested, best-in-class experiences for PWAs and AMP.

- The automated testing framework includes performance, end-to-end, unit, and linting tests that reduce risk and enable retailers to make changes faster. The average retailer deploys UX changes about once a month, while the average Mobify customer does **5 deployments per month**.

- To avoid risk when it comes to scalability, the Mobify Platform is built on cloud native and server-less technology that auto-scales to support traffic, allowing you to have the same consistent performance globally no matter the level of traffic or the shopper's location.

Conclusion: Timing is Everything

When is the best time to build a PWA? The short answer: now.

Google is driving the development of these modern web technologies to help retailers gain a competitive advantage through better, faster digital experiences. The customer-facing experience is where the potential to generate more revenue lies, so the priority should be improving the front-end before the backend.

> "Digital transformation takes years, but your customers need a great experience now. They don't care about the backend, they care about the experience – so improving your customer experience with a fast, engaging PWA will have the biggest impact on revenue."
>
> **DANIEL AN, GLOBAL PRODUCT LEAD, MOBILE WEB, GOOGLE**

If you want to increase agility and future-proof your front-end technology investments then your ultimate goal is probably an API-led approach – but you don't need to start there if your organization isn't ready for that yet. The first step could be deploying a mobile PWA to quickly get a better experience up on your highest traffic channel. With the Mobify Platform, any brand can get an enterprise commerce PWA to market quickly. Then you can migrate to APIs in the background and move over to a full front-end PWA to fully unlock the agility required to create the best customer experience, and keep up with the pace of the web.

Cheat Sheet: Evaluating API-Led Solutions for Delivering PWAs

Here's a quick summary of the API-led solutions covered in this guide.

	Vertically Integrated	Custom Front-end	Front-end as a Service
Shopper Experience			
Speed of innovation	Slow	Dependent on the capabilities of the internal team	Fast
Page load performance	Not optimal	Dependent on the capabilities of the internal team	Optimal (SSR)
Support for performance tuning	Minimal	None	Included
Support for pattern and component libraries	Minimal	Several to choose from depending on the framework	Included
Effort level required to extend the PWA to other touchpoints (app store, desktop, tablet)	High	High	Low

	Vertically Integrated	Custom Front-end	Front-end as a Service
Integration Management			
Certified connectors for ecommerce and CMS integrations	Limited	Custom (team needs to build and maintain)	Included
Frameworks for analytics and multivariate testing integrations	Limited	Limited	Included
Design patterns and integration best practices	Limited	None	Included
Analytics tracking and integrations	Limited	Limited	Included
Development & Operations			
Time to market	Unproven	Lengthy	3-4x faster than building from scratch
Tools and SDKs to develop, deploy and evolve	Minimal	Custom (select your own open source)	Included
Automated testing framework	None	Custom	Included
Auto-scales to support traffic	No	Custom (team would have to build it)	Included

Building Buy-In Across Your Organization

The digital experience touches so many departments across an organization and building a PWA with Front-end as a Service can facilitate success across each. If you're looking to build internal buy-in, here are the benefits you can focus on with each department.

Tech/IT teams will be able to...

- Adopt the latest and best-in-class technology and frameworks
- Integrate easily with current technology investments
- Balance the need to go fast and experiment with the need to focus on security, performance, and scalability
- Leverage the momentum of the web as the open web platform, which will grow faster and last longer than closed ecosystems

- Hire teams and skill sets that are more readily available than for proprietary technologies like native apps
- Decouple your front-end so that you aren't restricted by the release cycle of legacy systems
- Get an elevated starting point so that you can focus on strategic innovation

Ecommerce/Digital teams will be able to...

- Improve the digital customer experience and get closer to your customer
- Improve web performance
- Solve the mobile revenue gap problem

- Future-proof for emerging trends and touchpoints that shoppers will expect
- Encourage experimentation and daily customer experience improvements

Marketing teams will be able to...

- Improve brand perception with a better digital customer experience
- Create more loyal customers
- Unlock the ability to do continuous design improvements

- Improve SEO
- Leapfrog competitors stuck on legacy solutions
- Deliver on growth goals by turning mobile into a growth driver rather than a friction point

About Mobify

Mobify is a Front-end as a Service for building customer-first digital experiences through Progressive Web Apps (PWA), Accelerated Mobile Pages (AMP), and native apps. Retailers and brands use the Front-end as a Service to build PWAs that deliver fast, friction-free experiences across mobile, tablet, and desktop to immediately increase revenue. It resides on top of the CMS and/or ecommerce platform as a separate customer-facing layer, enabling an API-friendly best-of-breed approach to ecommerce and unlocking agility across the organization. Mobify customers include digital innovators like Lancôme, Debenhams, Crabtree & Evelyn, Payless Shoe Source, Carnival Cruise Line, US AutoParts, Hobbycraft, and PureFormulas.

Get in touch today to learn how your organization could leverage the Mobify Platform.

GET IN TOUCH NOW

mobify.com