eCommerce Progressive Web App Report
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**TITLE: ECOMMERCE PROGRESSIVE WEB APP REPORT**

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INTRODUCTION

The web is one of the biggest platforms on the internet. It is bigger than any other operating system or form-factor. The web has higher (as much as 3X) reach than mobile apps. This is due to the fact that it is much easier to navigate to a new website than an application since a new application requires downloading and installation first. However, the engagement is much more on mobile applications because it becomes tedious to type URLs again and again when you can just touch an icon on your home screen and start to engage.

What if you could give users deep, engaging experiences of a mobile application while having the reach of a website?

In the process, you also remove tedious steps such as installations via an app store? What if users land on your website and they get a native-app like experience along with all the perks of a real app such as Push Notifications, Splash Screens, and the capability to work offline.

This new breed of web applications is known as Progressive Web Applications (PWAs).

PWAs leverage Google development technology to deliver an incredibly fast, reliable and engaging mobile experience much like a native app - all within a user’s web browser.

PROGRESSIVE WEB APPS:

- **Work for all browsers and devices.**
- **Automatically update without manual downloads.**
- **Are fast with page transitions that feel instantaneous.**
- **Are easily shareable via links.**
- **Are reactive to user interactions and respond predictably.**
- **Engage users via push notifications and an immersive experience.**

To help eCommerce companies understand the current landscape and get a feel for where they stand, we analyzed a few of the top eCommerce PWAs.
CRITERIA AND METHODOLOGY

The eCommerce Progressive Web App Report details the results we found in examining 4 top retailers that have already adopted PWA technology.

We evaluated each of these PWAs according to 3 criteria:

1. **Speed** - how fast the initial landing page and a subsequent page loaded
2. **Predictability and Reactivity** - how smoothly the app scrolls, whether it’s quick to respond to input, whether it responds as expected
3. **Engaging** - does the app use push notifications and create an immersive experience

For each of the 3 criteria, we rated the Progressive Web Apps on a 1 to 10 scale, with 1 representing a “poor” PWA experience, 5 a “baseline” experience, and 10 an “exemplary” experience.

We then averaged scores of each PWA to get a final overall score.

1. SPEED

Speed is one of the most important aspects of a mobile experience. According to Google, 53% of users will abandon a site if it takes longer than 3 seconds to load.

To test speed performance, we used a combination of LightHouse (an open-source, automated tool for improving the quality of your Progressive Web Apps) and Google’s WebPageTest.

With these tools, we calculated the perceptual speed index (PSI) of a landing page and subsequent pages within the PWA’s search and discovery flow to measure the time the user feels it takes to interact with the website.

- Initial landing pages were tested using LightHouse.
- WebPageTest was used for a subsequent Product Description Page (PDP) using a script.

TESTED SITES

**west elm**
west elm is a Brooklyn-based branch of Williams-Sonoma, focused on the intersection of modern design, affordability, and community

**Starbucks**
Starbucks is the internationally renowned coffee roaster and purveyor with thousands of worldwide locations. Their PWA features online ordering and loyalty card reward redemption.

**Walmart Groceries**
Walmart Groceries is the retail giant’s food and homewares eCommerce experience, which offers customers the ability to shop online and pick up items in one of their 11,700 worldwide locations.

**1-800-Flowers**
1-800-Flowers.com is the world’s leading florist and gift shop. The company’s new PWA allows shoppers to browse, checkout and purchase items as fast as an app in their mobile browser.
**AN EXAMPLE SCRIPT FOR WEST ELM:**

Navigate: 
- https://mobile-beta.westelm.com/

Both tests were performed under 3G network conditions (1,400 Kbps up, 700 Kbps down, 562 ms latency) and WebPageTest data is the median of 9 runs.

Where scripts were unable to capture the data due to required login and cache states, we measured PSI manually in Chrome using the same network conditions.

**SPEED RESULTS**

**West Elm**
- Initial Landing Page PSI: 7,407 ms
- Subsequent Page PSI: 2,033 ms

**Starbucks**
- Initial Landing Page PSI: 6,881 ms
- Subsequent Page PSI: 1,372 ms

**Walmart Groceries**
- Initial Landing Page PSI: 15,233 ms*
- Subsequent Page PSI: 3,410 ms

**1-800-Flowers**
- Initial Landing Page PSI: 7,219 ms
- Subsequent Page PSI: 1,382 ms

*Note: This isn’t the full experience, which only displays once a user enters a zip code.
2. PREDICTABLE AND REACTIVE

Experiences need to be Predictable and Reactive so the user feels in control.

Otherwise, building friction and frustration leads to abandoned carts and other disengagement; content moving up and down as it loads, unreactive buttons, and content loading in unexpected locations are all major issues that plague non-Progressive Web App experiences.

To calculate Predictable and Reactive scores, we went through the product discover flow of each PWA to measure:

Jank - whether app elements jump up and down suddenly during scrolling and page loading.

Placeholders - whether locations of still-loading content use visual approximations of the final content to set user’s expectations.

Reactiveness - whether the app responds to user input in slow or unexpected ways.

For the final score, we weighted each factor as follows:

- Jank: 40%
- Placeholders: 20%
- Reactiveness: 40%

EXAMPLES OF JANK FROM WALMART GROCERY
PRODUCT DESCRIPTION PAGE:
EXAMPLE OF CORRECT USAGE OF PLACEHOLDERS FROM 1-800-FLOWERS CATEGORY PAGE:

RESULTS

<table>
<thead>
<tr>
<th>Store</th>
<th>Jank</th>
<th>Placeholders</th>
<th>Reactiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Elm</td>
<td>Some</td>
<td>Sometimes</td>
<td>&lt;100 ms</td>
</tr>
<tr>
<td>Walmart Groceries</td>
<td>A Lot</td>
<td>Sometimes</td>
<td>&gt;500 ms</td>
</tr>
<tr>
<td>Starbucks</td>
<td>None</td>
<td>Sometimes</td>
<td>&lt;100 ms</td>
</tr>
<tr>
<td>1-800-Flowers</td>
<td>None</td>
<td>Sometimes</td>
<td>&lt;100 ms</td>
</tr>
</tbody>
</table>

3. ENGAGING

With mobile web revenues dominating those of mobile apps it’s essential for a Progressive Web App to offer an engaging experience that draws users in and keeps them coming back. Unlike traditional mobile website technologies, PWAs offer additional features that allow eCommerce retailers to better optimize conversions and increase re-engagement.
PWA Features include:

- Native Push Notifications
- Native Payment options
- Long-Lived, Logged-In User Sessions
- Offline Access
- Full-Screen Usage
- Home Screen App Icons

To calculate Engagement scores, we focused on notifications and an immersive experience, weighting each as follows:

- Push Notifications: 30%
- Immersive Experience: 70%

### RESULTS

<table>
<thead>
<tr>
<th>App</th>
<th>Fast</th>
<th>Predictable and Reactive</th>
<th>Engaging</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Elm</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>6.3</td>
</tr>
<tr>
<td>Starbucks</td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>8.3</td>
</tr>
<tr>
<td>Walmart Groceries</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>3.3</td>
</tr>
<tr>
<td>1-800-Flowers</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>9.0</td>
</tr>
</tbody>
</table>

OVERALL TOTAL SCORE
1-800-FLOWERS DELIVERED A PROGRESSIVE WEB APP USING THE MOOVWEB PLATFORM

SECURE & SEAMLESS INTEGRATION

Unlike traditional websites, PWAs usually require APIs. While 1-800-Flowers had some APIs these were built for native applications and weren’t designed for web browsers, especially when it came to security. Meanwhile, other critical functionality such as demand generation, SEO, and CMS content lacked any API support at all. Using Moovweb’s Node-based cloud platform, 1-800-Flowers was able to securely convert their existing native app APIs and create synthetic APIs for missing functionality. In addition, the platform let them add advanced caching and combine API calls server side using the JavaScript language that was already familiar to the team. This let them deliver a lightning fast PWA that leveraged their existing technology and personnel investments.

50% INCREASE IN CONVERSION RATES

Moovweb’s Progressive Migration and advanced A/B testing capabilities let the 1-800-Flowers team experimentally test each channel and flow against their existing mobile site. This gave them the ability to microtarget and tweak the performance of the new PWA as needed, resulting in a launch that delivered 50% increase in conversion rates.

CONCLUSION

In today’s competitive landscape, shoppers have high expectations from eCommerce companies and those companies that fail to meet them will continue to lose market share to their competitors.

You may not have heard of PWAs until reading this report. Or you may have been closely following Google’s developments in this space over the past year or so. Either way, PWAs are not only a better solution for mobile web — they are arguably the future of mobile commerce.

Customers interact with your online business in app-like user experience that results in higher engagement as well as revenue while simultaneously reducing your costs. It may seem like it’s early days for PWA adoption among your peers but the most innovative online businesses are already in the process of implementing if not at least considering PWAs as a replacement for responsive sites, Android apps and, more broadly, to unify their web and app efforts.

To learn more about how the Moovweb platform can help your company, visit our website.