

WHY UPGRADE TO PROGRESSIVE WEB APPS?

Why you should make all your web sites
Progressive Web Apps and where to get started

The Progressive Web Application Experts

LOVE2DEV

 <https://facebook.com/love2dev>

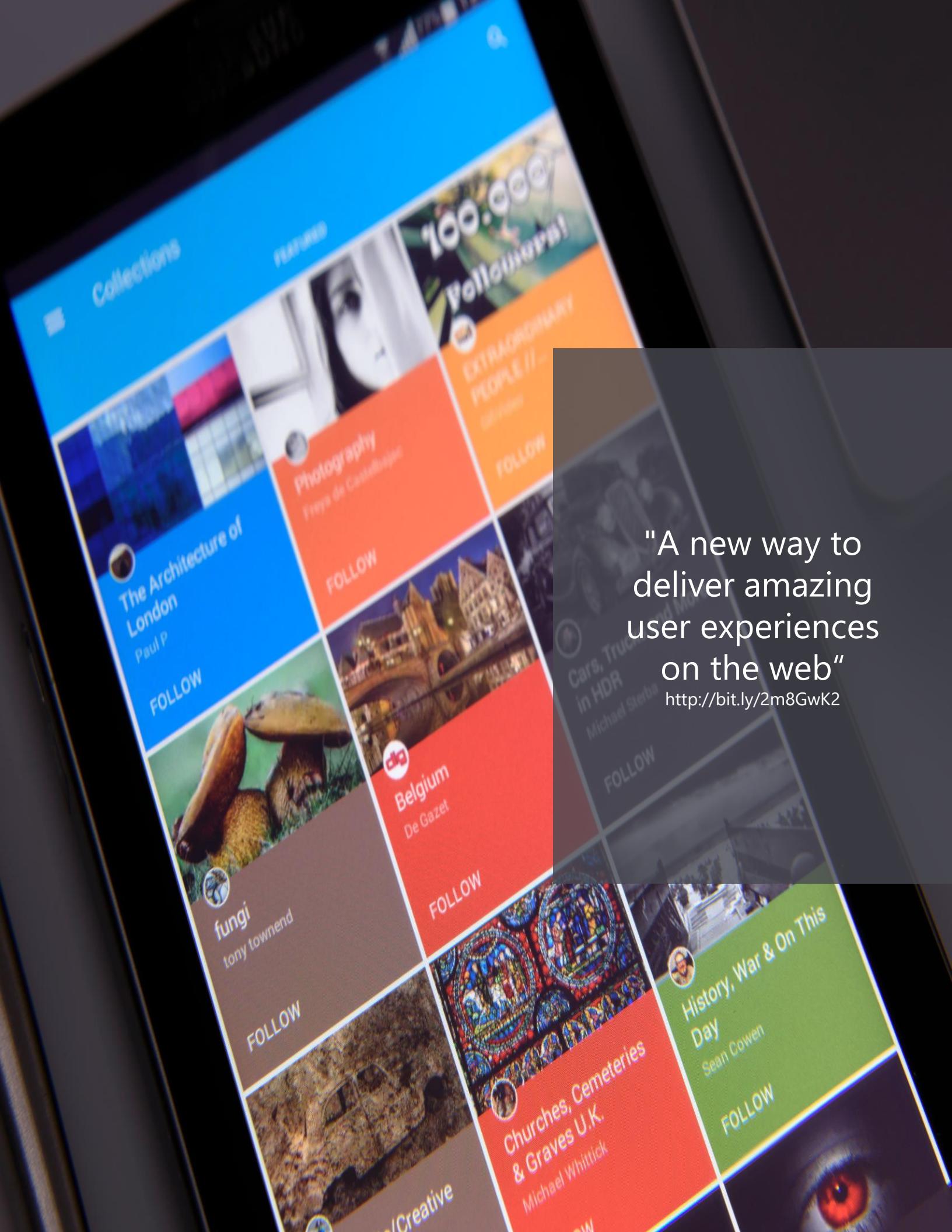
 <http://bit.ly/2j3sAlG>

 @chrislove

 info@love2dev.com

 www.love2dev.com

PWA

A collage of various mobile application screens, likely from the Microsoft Modern UI framework, showing different user interfaces and content. The screens include a 'Collections' section with a blue header, a 'FEATURES' section, and several cards for users like 'fungi', 'Belgium De Gazet', 'Churches, Cemeteries & Graves U.K.', and 'History, War & On This Day'.

"A new way to
deliver amazing
user experiences
on the web"

<http://bit.ly/2m8GwK2>



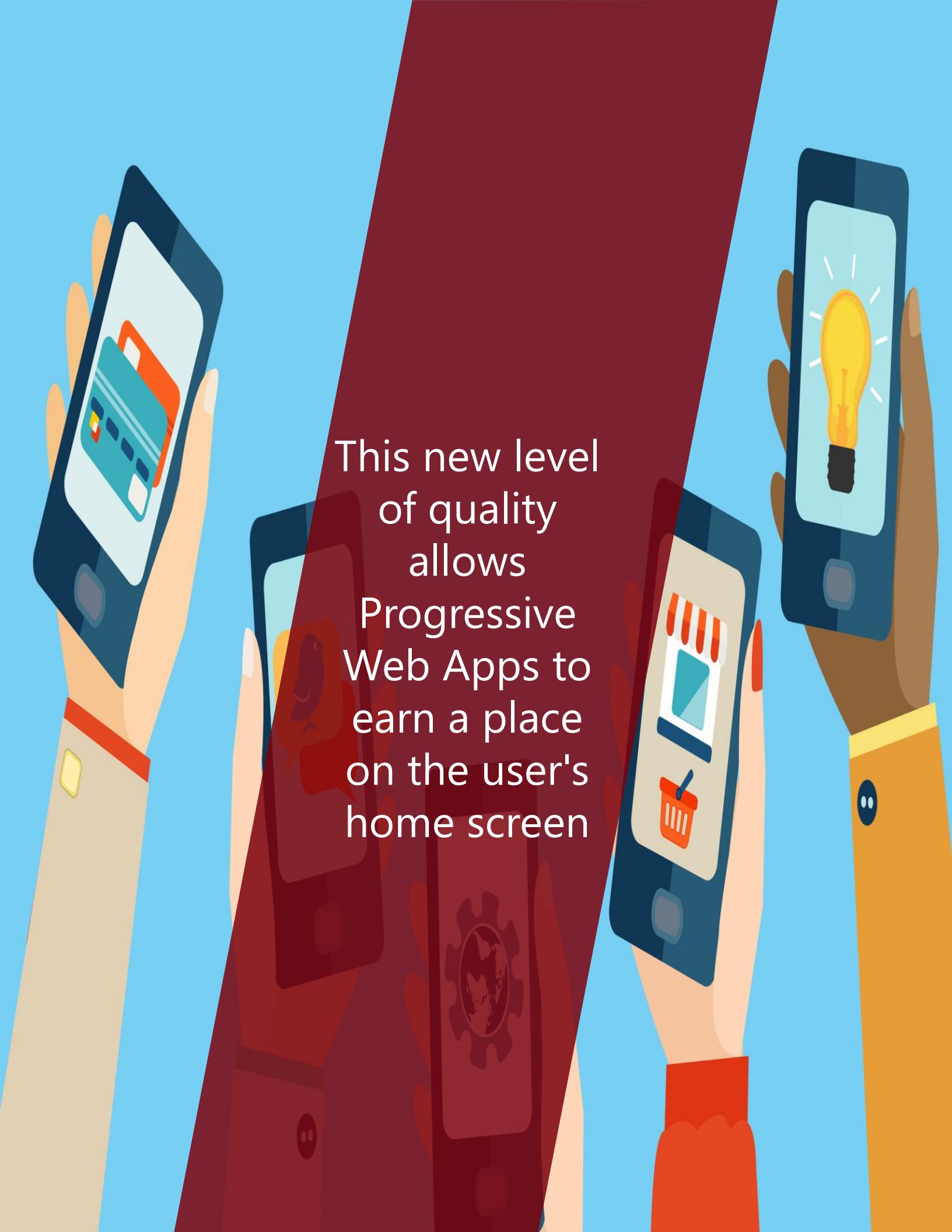
Doesn't need to be maintained separately from a native app; it can replace the app experience

A Progressive Web Application provides an engaging user experience. It starts with pages that load instantly and can work offline.

The sites are secure, so browsers have more confidence in their integrity.

Browsers use their web manifest to understand more about the site and its branding.

As a reward, sites can be added to the device's home screen and launched like a native application.



This new level
of quality
allows
Progressive
Web Apps to
earn a place
on the user's
home screen

3 User Experience Requirement of Progressive Web Apps

FAST

Responds
Quickly To
User

RELIABLE

Works Online
Offline
Poor Connectivity

ENGAGING

Immersive
User
Experience



“Progressive Web Applications: A New Level of Thinking About the Quality of Your User Experience”

<https://www.youtube.com/watch?v=EErueQdEXMA>

Chris Wilson

Chrome

“These apps aren’t packaged & deployed through stores, they’re just websites that took the right vitamins.

They progressively become apps...”



Alex Russel

Chrome



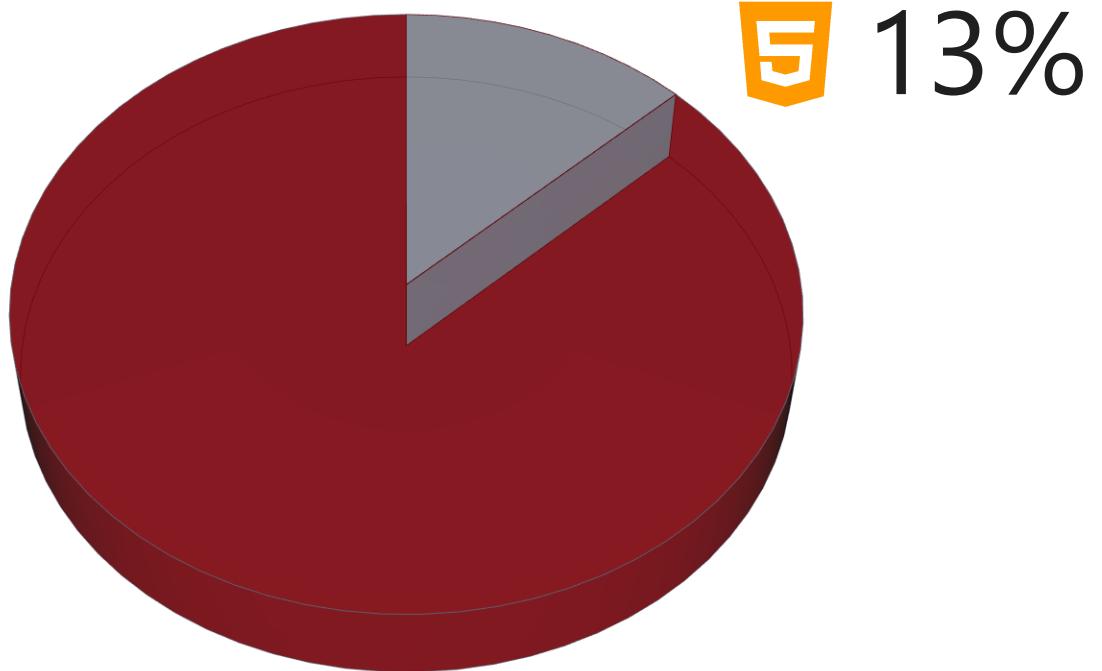
“Native Apps are a bridging technology (like Flash)”

<http://bit.ly/2e5Cgry>

Bruce Lawson

Former Head Opera

MOBILE WEB VS. APP USAGE



87%

Native applications consume the majority of consumers' screen time. An apparent victory for native applications. But this does not tell the whole story.

80%

OF TIME SPENT
IS IN USERS'
TOP 3 APPS

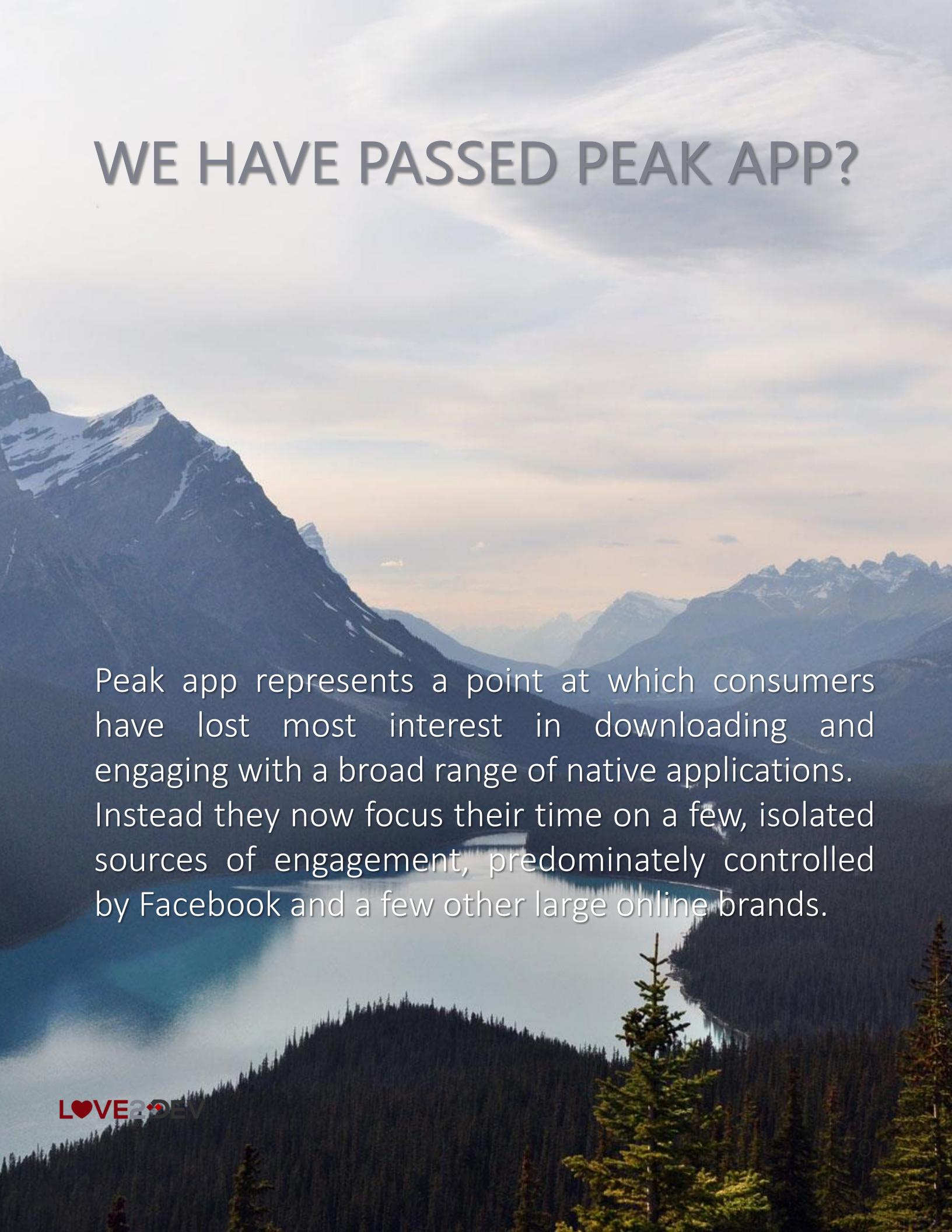


Facebook dominates consumer screen time. The remaining app usage is limited to other big brands like Google and Snapchat. This leaves very little time or interest for remaining apps.

Facebook is often considered to be an additional browser with a closed/controlled web of content. Much of the content on Facebook is embedded web pages.

Source: comScore Mobile Metrix June 2015 – US – Age 18+

WE HAVE PASSED PEAK APP?

A scenic landscape featuring a range of mountains with snow-capped peaks in the background. In the foreground, there's a body of water, possibly a lake or a large river, reflecting the warm colors of the setting sun. The sky is filled with soft, pastel-colored clouds. The overall atmosphere is serene and majestic.

Peak app represents a point at which consumers have lost most interest in downloading and engaging with a broad range of native applications. Instead they now focus their time on a few, isolated sources of engagement, predominately controlled by Facebook and a few other large online brands.

ZERO

NUMBER OF APPS

AN AVERAGE USER

INSTALLS

PER MONTH

Customers have dealt a fatal blow to the promise of native applications by choosing to not bother downloading apps.

There are many reasons for this change in behavior including disk space limitations, privacy concerns and app store friction.

Source: comScore Mobile Metrix June 2015 – US – Age 18+

Web is the #1 place customers discover and interact with new services. The web is designed to make word of mouth, search engine optimization or social media marketing easier.

The Web's Super Power is Ability to Link



Verizon LTE 11:35 AM 67%

bing.com

jeans

WEB IMAGES VIDEOS NEWS

Ads related to jeans

Levi's® Official Site
www.levi.com
Shop For New Fall Styles Today. Free Shipping on Orders \$100+.
753,700+ followers on Twitter
Levi's® Men's Levi's® Women's
Levi's® 501® Original Levi's® Vintage Clothing

Jeans at American Eagle - Huge Selection & In-Store Returns!
AE.com/Jeans
Huge Selection & In-Store Returns! Shop **Jeans** At AE
Men's - Slim Jeans Men's - Bootcut Jeans
Women's - Skinny Jeans Women's - Jeggings

Images

See more images

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“URL sharing is... what enabled the web to spread and prosper, and ... I call it out as the web’s superpower.”

Alex Russell
<https://infrequently.org/>
5.31.2016

PROGRESSIVE WEB APP ADVANTAGES

LINKABLE

Easily share via DEEP URLs, does not require complex installation.

DISCOVERABLE

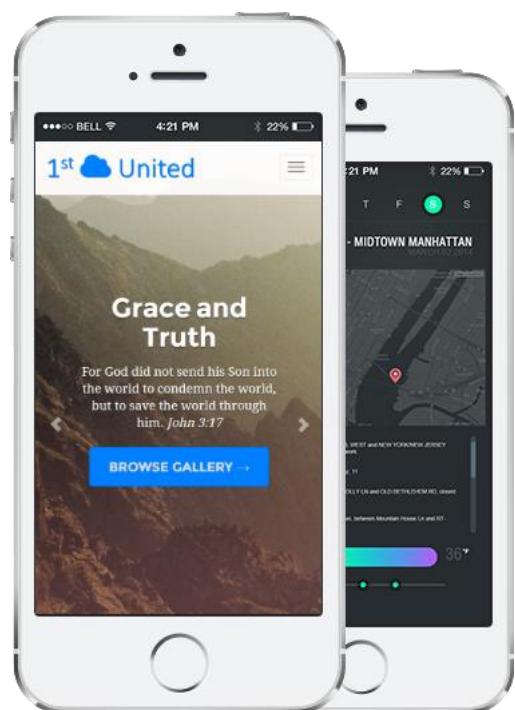
from visiting a website to an installation prompt and installation that takes less than 10 seconds

“INSTALLABLE”

You only need a link and a click.

Browsers can prompt user to “Install.”

Allows users to "keep" apps they find most useful on their home screen without the hassle of an app store.



APP-LIKE FRESH RE-ENGAGEABLE

App-like - App-style interactions and navigation, built on the app shell model.

Fresh - Always up-to-date thanks to the service worker update process.

Re-engageable - Makes re-engagement easy through features like push notifications.

PROGRESSIVE WEB APP ADVANTAGES

Multi-Platform

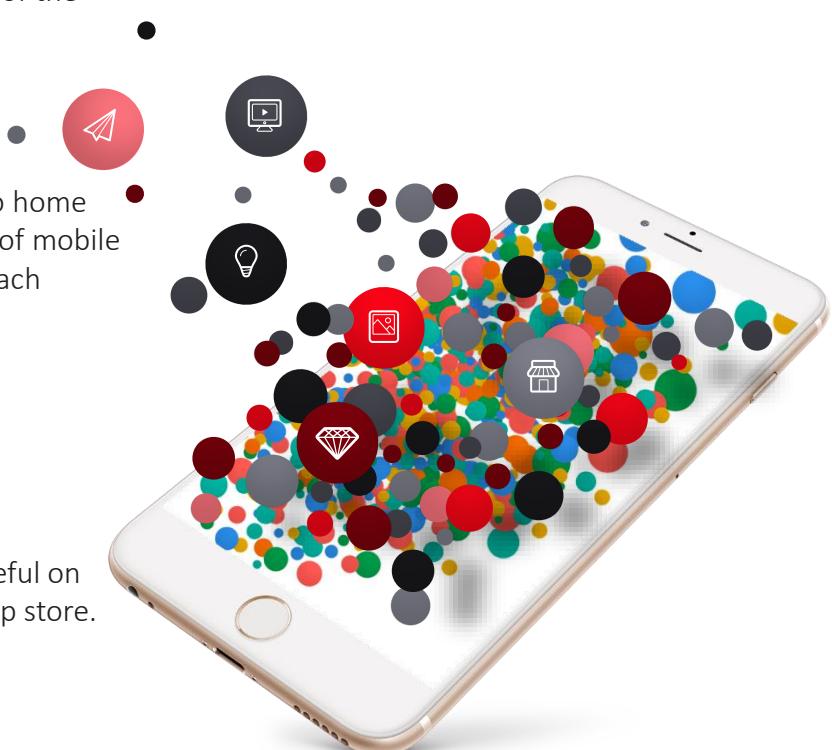
developers only have to develop one code base, decreasing the cost and improving the quality of the final product

Frictionless

almost no download time, prompted to add to home screen when viewing the website. About 60% of mobile users don't download a single new apps each month.

Small Download Size

You only need a link and a click.
Browsers can prompt user to "Install."
Allows users to "keep" apps they find most useful on their home screen without the hassle of an app store.



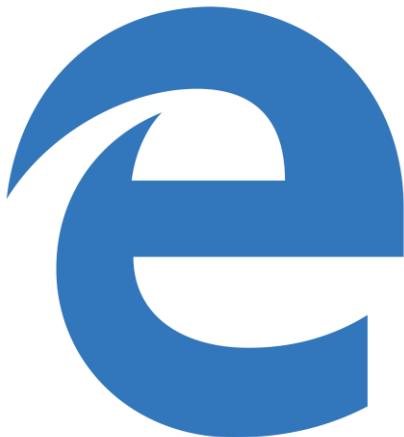
Instant Updates

service workers allow new scripts / stylesheets to be used as soon as they are deployed to the server so the user doesn't even need to press an update button.

Run On Any Device and Any Browser



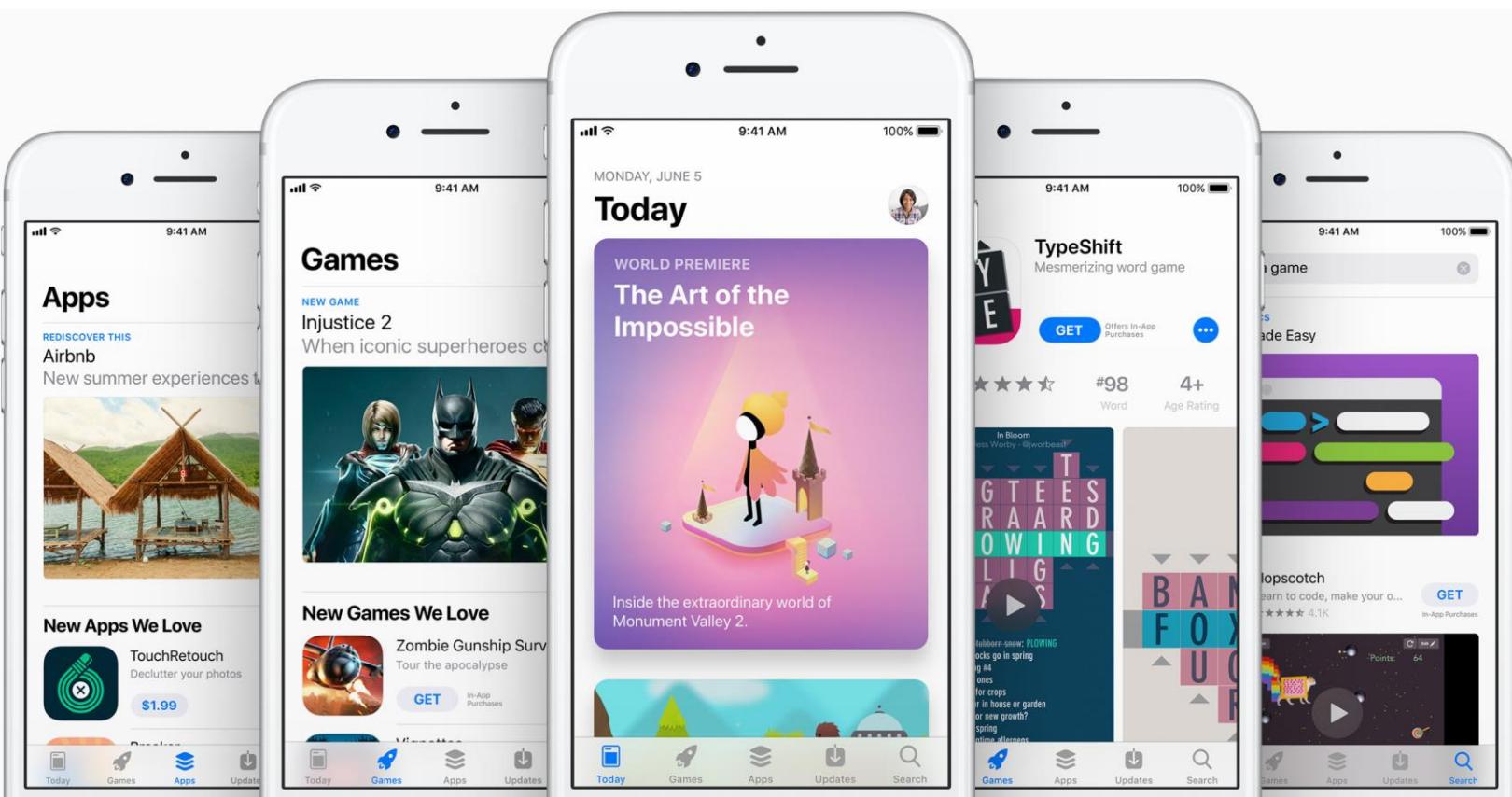
Progressive Web Applications have enthusiastic support from multiple browsers and platforms. All modern browsers and platforms support PWA features.



APPLE REJECTING & REMOVING APPS

"If your app is not particularly useful, unique, or “app-like,” it doesn't belong on the App Store."

Apple Design Guidelines



Apple has been aggressively removing apps from the App Store and rejecting more submissions. They recommend the owners use the web instead.



5miles

Flipkart A yellow square with a blue stylized 'f' inside.

Jayantini A red arrow pointing right followed by the name "Jayantini".



The Weather Company
An IBM Business



west e

guardian

lyft

Alibaba.com®
Global trade starts here.™

Adopted By 1000s of
Major Brands



mynet

The Washington Post

konga.com

360

Bukalapak
.com

TWITTER

- 65% increase in pages per session
- 75% increase in Tweets sent
- 20% decrease in bounce rate

The Twitter Lite Progressive Web App combines the best of the modern web and native features. It became the default mobile web experience for all users globally in April 2017.

FLIPKART

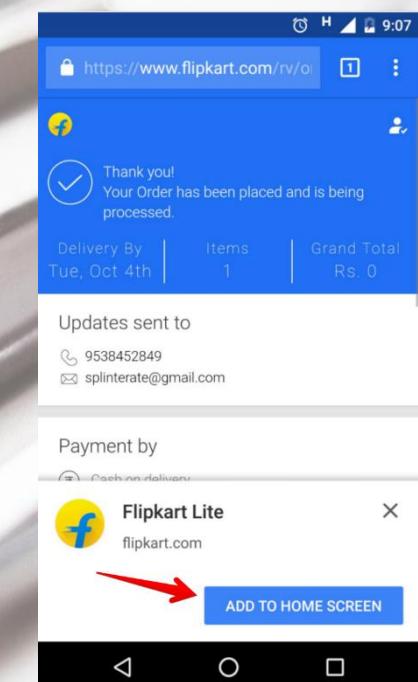
📈 3X more time on site

📈 40% higher re-engagement

📈 70% greater conversion

from home screen

📈 3X lower data usage



Apps Must Handle Offline

Offline-first should be a first class application requirement. When web sites are created with offline as a primary design requirement they perform faster. You treat the network as an enhancement, not a requirement.

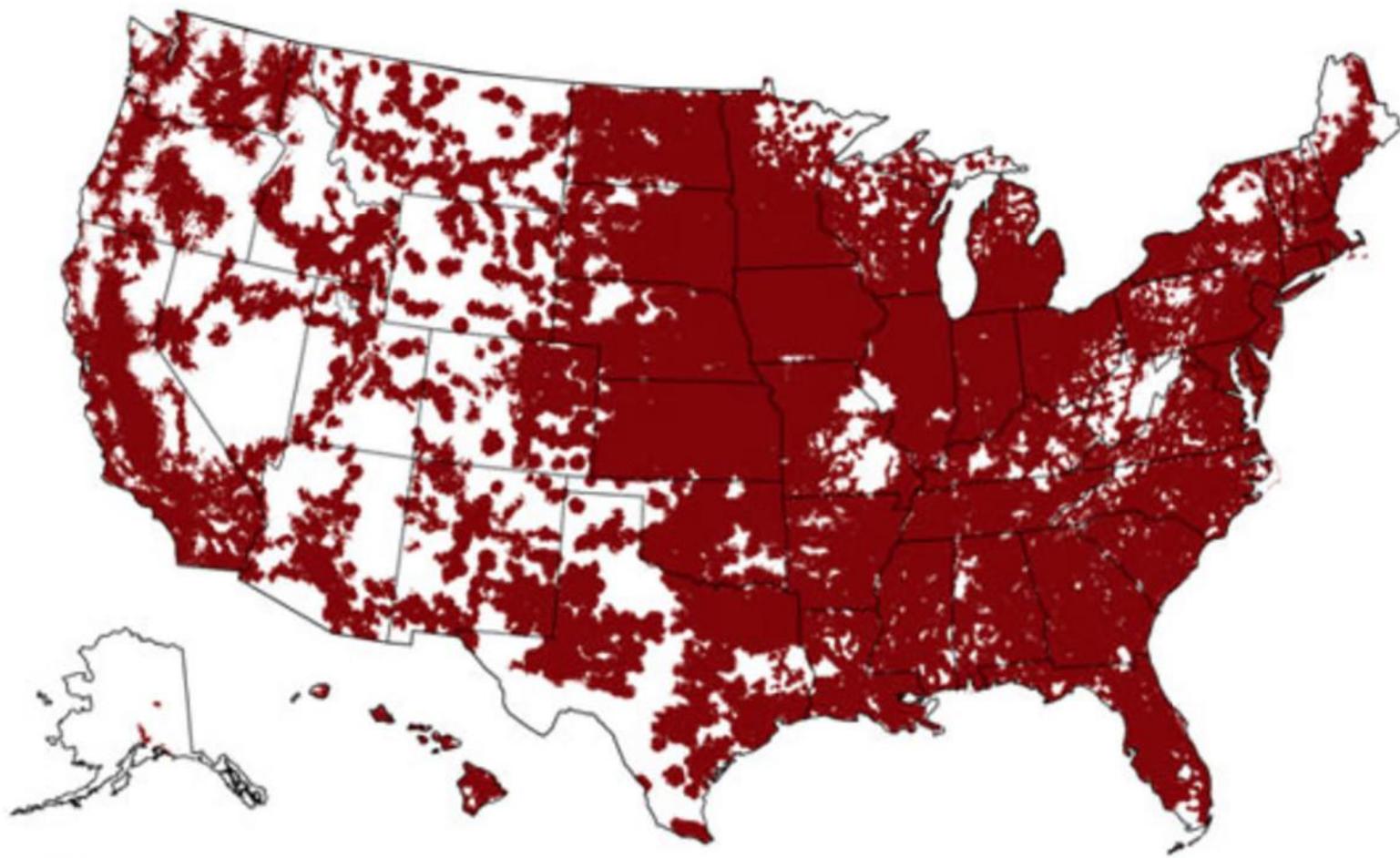
Developers consider the end-user's worst-case scenario and code for it, instead of their fast, optimized desktop environment.

Progressive Web Apps require service workers, which supply a rich content caching environment. Having a local copy of the web site causes it to load faster by eliminating most network requests.



5 BARS!

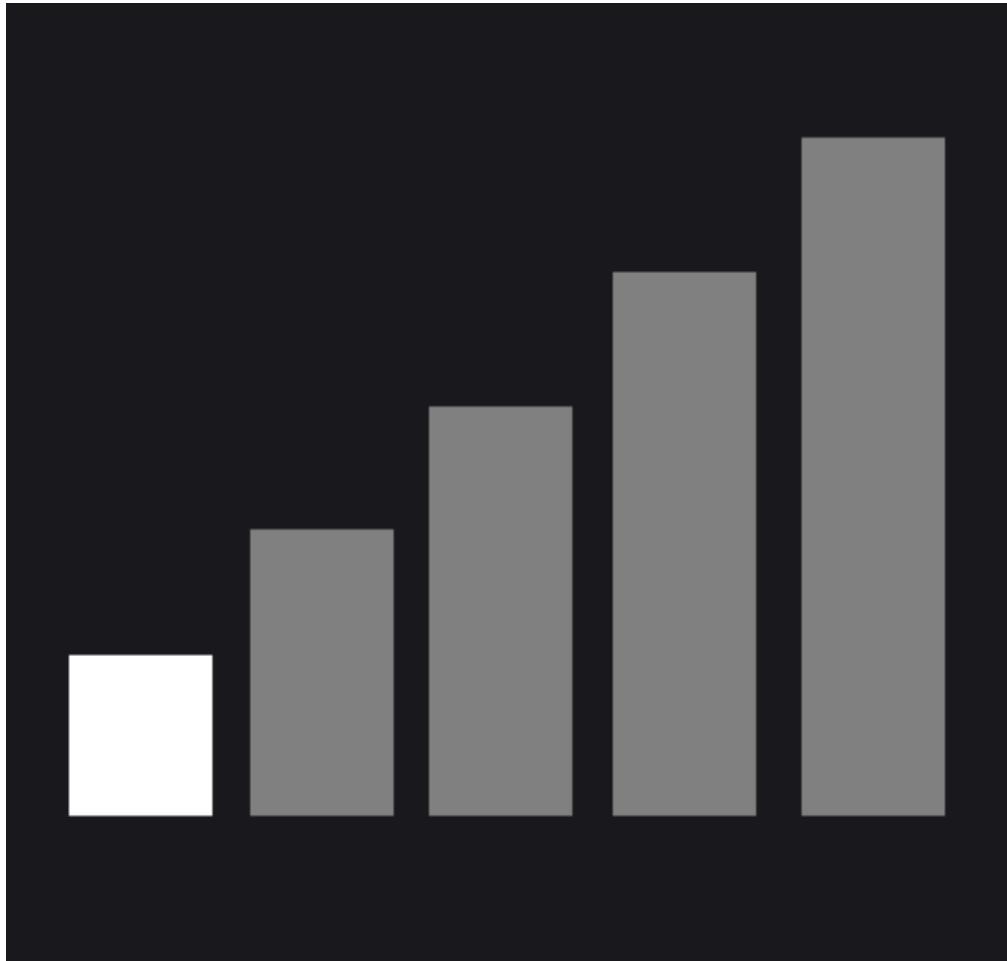
The majority of consumer devices are now mobile, often connecting to the Internet via cellular connectivity. High speed connectivity is ubiquitous in the developed world. However much of the world is still limited to 3G and lower speeds.



■ VERIZON 4G LTE COVERAGE

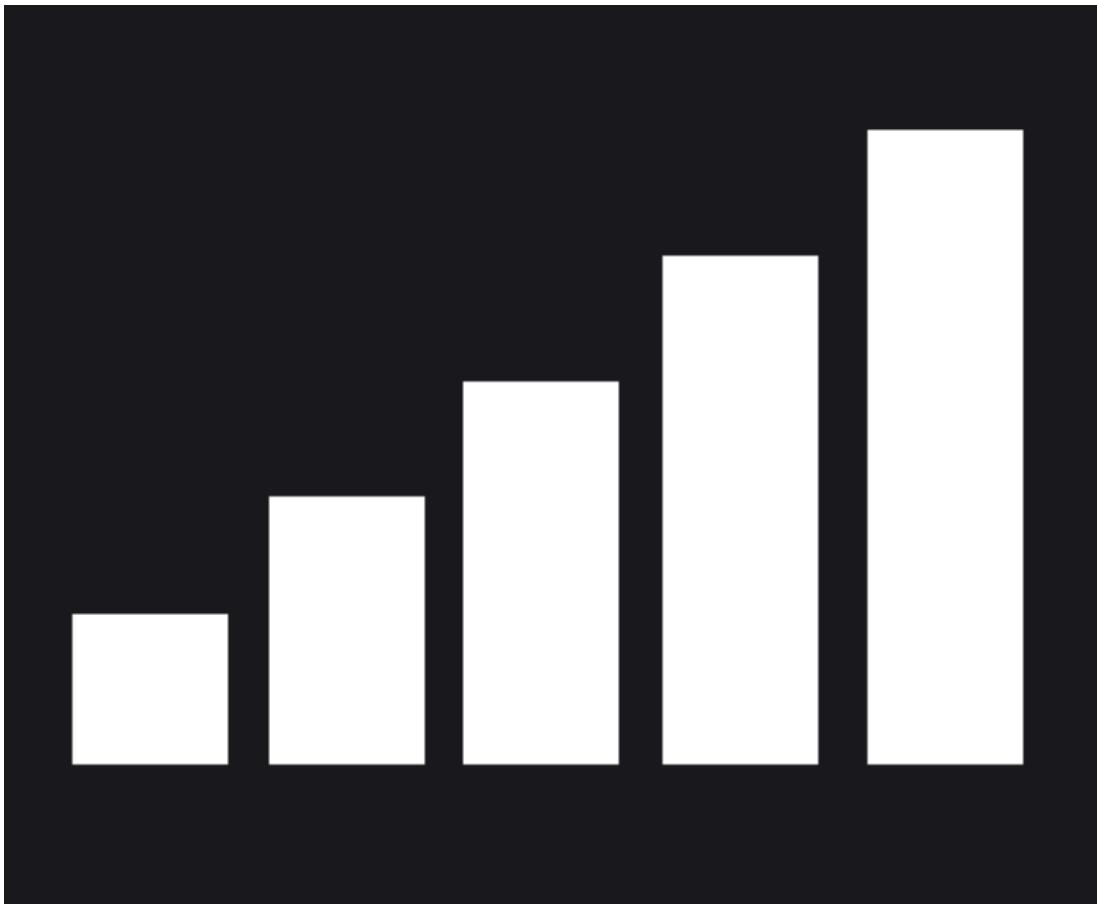
Despite broad, high speed coverage by major carriers in the developed world. There are many times where connectivity is weak or not available.

Think about your own experiences with limited or no connectivity. Approximately 25% of the United States **only** connects to the Internet via cellular. These connections are not as reliable as home or office broadband.



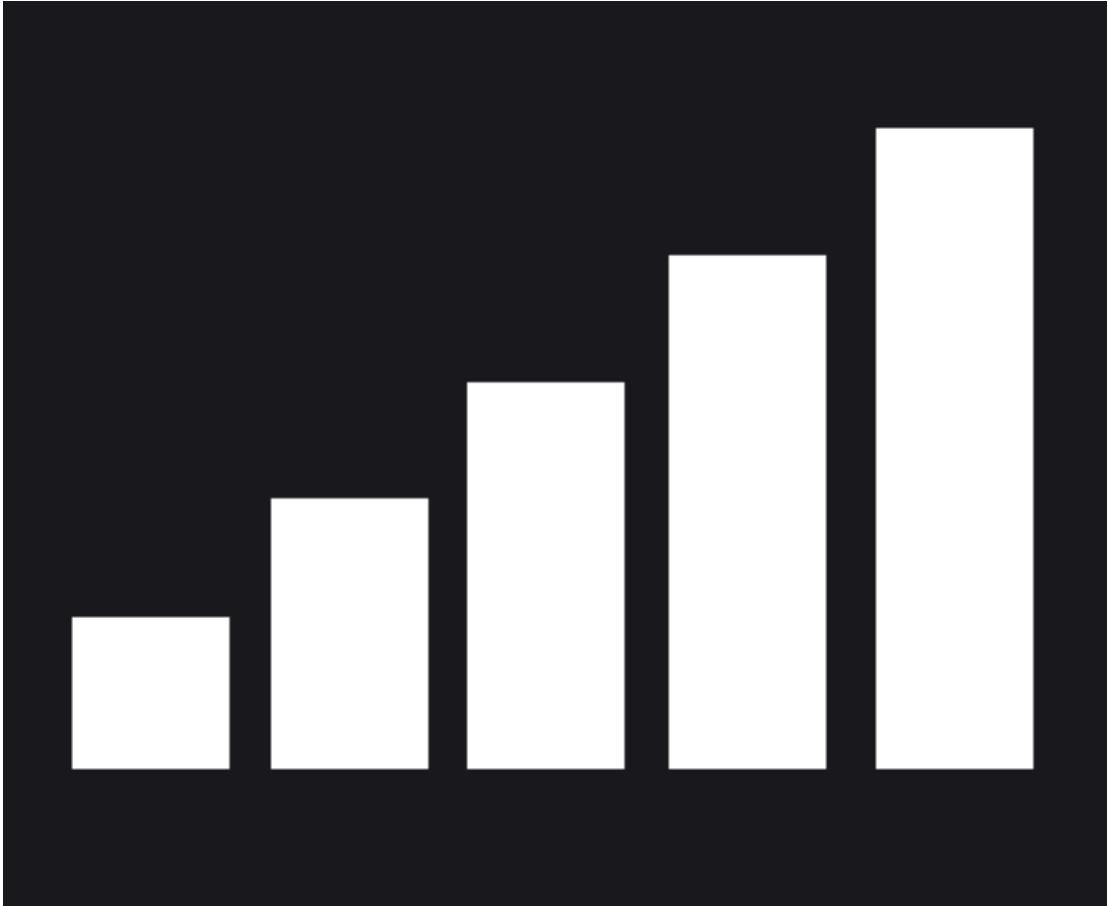
1 BAR ☹

Often these weak connections are represented with fewer connectivity bars, or slower service connections like 4G and Edge networks.



NO BARS ☹

Sometimes your phone cannot connect at all- representing the sad news with no bars.



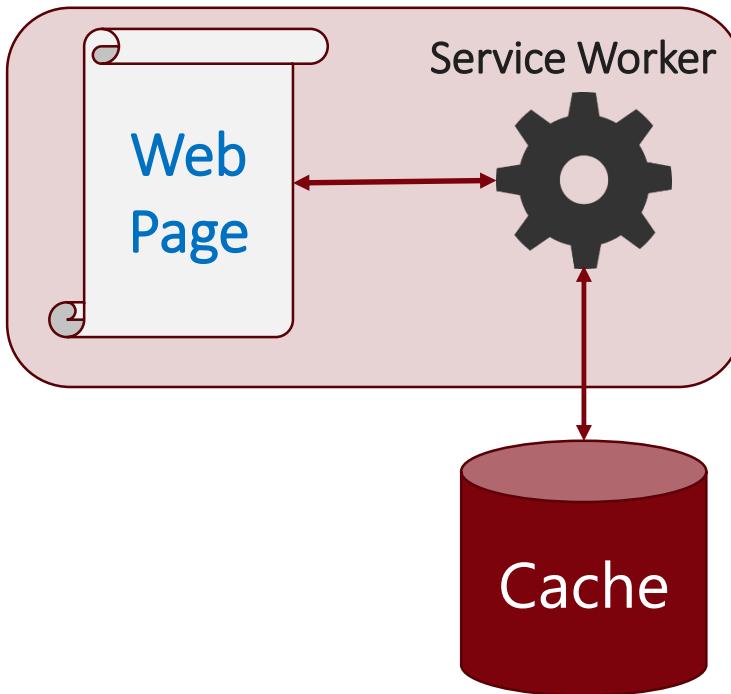
LiFi :/

Worst is when the phone appears to be connected, but it isn't. This state, called "LiFi," leads customers to assume they are online, but they really are not. Instead they are connected to a cell tower that has not completed the connection to the outside world. This frustrates customers, who often blame the web site, not the cellular technology.

SERVICE WORKERS ENABLE RELIABLE OFFLINE

Service Workers are a new HTML5 technology enabling a manageable offline experience. Unlike previous attempts with appCache and browser cache, developers and architects are in control of what is cached and how long it is cached.

Web site performance benefits because web assets can now be loaded locally, rather than across the network. This enables “instant” page loads once the web site is “installed.”



PWA LEGACY TECH UPGRADES



➤ appCache -> Service Worker

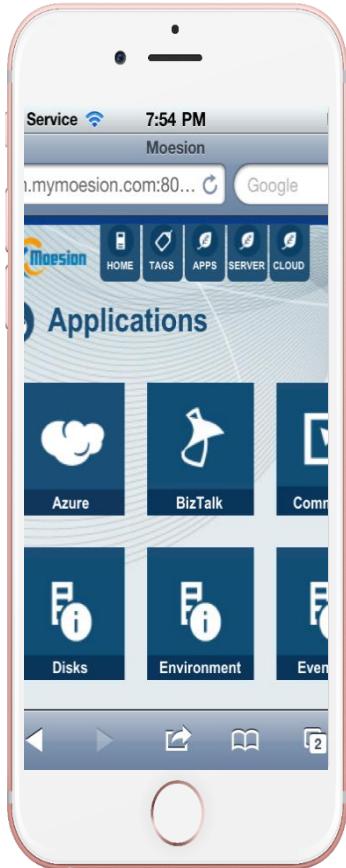
appCache is a web standard, which allowed web sites to work offline, but it's frustrating to debug. Service Worker, a script the browser runs in the background, replaces appCache & enables offline. Service workers include a rich caching capability that provides granular control.

➤ localStorage -> IndexDB

localStorage is a browser storage option made available in the IE 8 era. It provides simple key value, synchronous storage.

IndexDB is a richer browser database based on No-SQL technology. It is event driven, making it asynchronous. All modern browsers support IndexDB, making it a great choice to persist web site data.

PWA LEGACY TECH UPGRADES



➤ Touch Icons -> Manifest

When Apple introduced the iPhone they also introduced touch icons. Touch icons are defined in META tags. They extend to also allow minimal control over the home screen experience.

A web manifest is a JSON document describing a web site to the browser. The browser uses this information to drive the home screen experience.

➤ Save to Homescreen -> Install Banner

In the past you needed to maintain code to prompt the user to add your site to the home screen.

When a browser identifies a progressive web application it will automatically prompt the user to add the site to the home screen based on non-intrusive heuristics.

TECHNICAL REQUIREMENTS

SECURE

Site is served over secure connection (HTTPS) & no mixed content



WORK OFFLINE

The start URL (at least) loads while offline

WEB MANIFEST

Metadata provided for Add to Home screen



BE FAST

First load should be fast; time to interactive <10s for first visit on a simulated 3G network.

SERVICE WORKER

Script the browser runs in the background, separate from a web page; allows for features including push notifications and background sync



UX REQUIREMENTS

PROGRESSIVE



Works for every user, regardless of browser choice because it's built with progressive enhancement as a core tenet

APP-LIKE



Feels like an app to the user with app-style interactions and navigation because it's built on the app shell model

RESPONSIVE



Fits any form factor: desktop, mobile, tablet, or whatever is next



FRESH

Always up-to-date thanks to the service worker update process

CONNECTIVITY AGNOSTIC



Enhanced with service workers to work offline or on low-quality networks



LINKABLE

Easily share via URL, does not require complex installation

SERVICE WORKERS

"A service worker is a script that stands between your website and the network, giving you, among other things, the ability to intercept network requests and respond to them in different ways."

Smashing Magazine: <http://bit.ly/2phZM8v>

- ⚙️ A service worker is a script that your browser runs in the background
- ⚙️ Manages Tasks & Features That Don't Require User Interaction
- ⚙️ Frees Up the UI Thread for...UI Stuff
- ⚙️ An Extensible Platform For the Web

- ⚙️ Includes Rich Cache API
- ⚙️ Enables Native Push Notifications
- ⚙️ Background Synch & Additional Features being created



WEB MANIFEST



JSON Document

Creating a manifest and linking it to your page are straightforward processes



Describes Your App

Control what the user sees when launching from the home screen



Reference in HEAD

Progressive Enhancement. Ignored by legacy browsers and only downloaded when needed.

```
{  
  "name": "Fast Furniture",  
  "short_name": "Fast Furniture",  
  "icons": [...],  
  "start_url": "/",  
  "display": "standalone",  
  "background_color": "#F99D36",  
  "theme_color": "#55B4F6"  
}
```

Include a reference to the web manifest file in the HTML HEAD element. The browser will read the file to design the home screen experience.

```
<head>  
  <link rel="manifest" href="/manifest.json">  
</head>
```

HTTPS

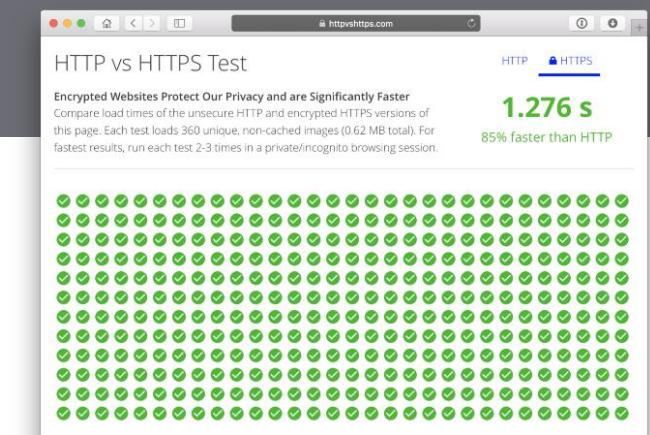
- 🔒 Performance Improvements
- 🔒 Browsers Gating Features Behind HTTPS



- 🔒 Google & Bing Use HTTPS as a Positive Search Signal
- 🔒 Certificates have become a Commodity
- 🔒 Let's Encrypt and others Offer Certificates for Free or \$10/year
- 🔒 Amazon AWS Offers free Certificates for CloudFront and their Network Load Balancer Services

"When we launched [HTTPS], we saw an average of a 50ms hit for negotiation... it was more than offset when we activated HTTP/2... a month later we saw a 250ms drop per pageview"

Weather.com



Let Love2Dev Upgrade Your Website

01

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

02

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

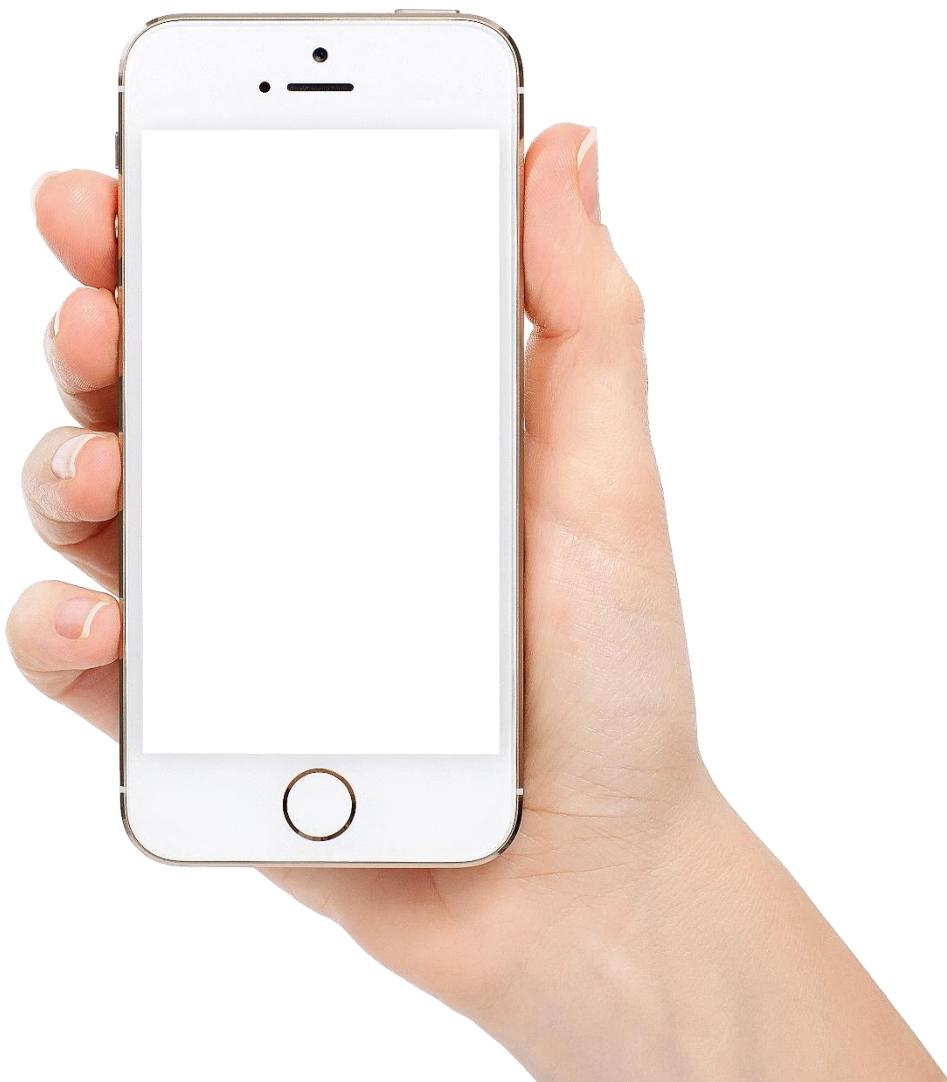
03

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

04

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

[GO TO WEBSITE DEMO](#)



Progressive Web Application Development by Example

Develop fast, reliable, and engaging user experiences for the web



Packt

www.packt.com

By Chris Love



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The Source to Learn How to Build Home Screen
Worthy Progressive Web Applications

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start your PWA Journey!

PWA



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