

**WEBSITES
AS
1ST CLASS APPS**



@jbmoelker

WEBSITES / WEB APPS?

anything we can
build with
web technology

WEB TECHNOLOGY

The Web platform: Browser technologies

Core platform

- HTML
- DOM
- ECMAScript
- URL
- Fetch (includes CORS)
- XMLHttpRequest
- Encoding

CSS features

- CSS roadmap
- Animations
- Background-image options
- Border images
- Border radius (rounded corners)
- Box shadows
- Box sizing
- Cascading and inheritance
- Colors
- Compositing and Blending
- Device Adaptation
- Downloadable fonts (@font-face)
- Exclusions
- Feature queries (@supports)
- Filter Effects
- Fixed positioning (position:fixed)
- Flexible box layout (Flexbox)
- Font-feature settings
- Font loading
- Gradients
- Grid layout
- Hyphenation
- Image Values and Replaced Content
- Logical properties
- Masking
- Media Queries
- Motion paths
- Multiple-column layout
- Multiple backgrounds
- Opacity
- Overflow
- Pointer events

Pseudo-elements

- Scroll Snap Points
- Selectors
- Shapes
- Sticky positioning (position:sticky)
- Style attributes
- Syntax
- Text decoration
- Text overflow
- Text shadows
- Transforms (2D)
- Transforms (3D)
- Transitions
- Values and Units
- Will Change
- Writing modes
- CSSOM (CSS Object Model)
- CSSOM View Module

UI Events (formerly DOM Events)

- Pointer Events
- Touch Events
- Pointer Lock
- Gamepad
- getUserMedia
- Battery Status
- Vibration
- Beacon
- HTML Media Capture (the capture attribute)
- Clipboard API and events

Storage and Files

- Storage (NavigatorStorage+StorageManager)
- Web Storage (localStorage)
- Indexed Database
- File API
- Blob URLs
- File Reader

Real-time communication

- WebRTC
- Object RTC (ORTC) API for WebRTC
- WebSocket protocol
- WebSocket API
- Server-Sent Events
- Push API

Web Components

- Custom Elements
- Shadow DOM
- Templates

HTML bonus features

- classList (DOMTokenList)
- dataset (data-* attributes)
- async for scripts
- defer for scripts
- Session-history management
- hashchange
- Sandboxed iframe
- Drag and drop
- contentEditable
- HTML Editing APIs

ARIA

Performance optimization and analysis

- Web Workers
- Shared Workers
- Timing control for script-based animations
- Navigation Timing
- Page Visibility
- User Timing
- Performance Timeline
- High Resolution Time
- SIMD (Single instruction, multiple data)

Security and privacy

- Content Security Policy (CSP)
- Upgrade Insecure Requests
- Web Cryptography API
- Referrer policy
- Tracking Preference Expression (DNT)

Other core-platform bonus features

- Structured cloning
- Transferable objects
- Mutation observers
- Streams
- DOM Parsing and Serialization
- DOM XPath
- Quirks Mode
- Internationalization API
- Promises
- JSON parsing
- Typed Array
- Service Workers
- querySelector() method
- matches() method
- matchMedia() method
- data URLs

Various other

- Web IDL
- Link header
- Content-Disposition header

A feature history of the modern Web Platform

1ST CLASS APPS?

always available

easily accessible

always up-to-date

adapts to screen

access device in-/outputs

communicate with other apps

can be fullscreen

discoverable

...

ROAD TO 1ST CLASS

- 
- Chrome Apps
 - IE Pinned Sites
 - Metro Apps
 - Firefox OS Apps
 - Hosted Web Apps
 - Hybrid Mobile Apps
 - Electron Apps
 - Progressive Web Apps

CHROME APPS





CHROME APPS (2010-2016)

chrome web store jasper@voorhoede.nl

Search the store

Apps **Games** **Extensions** **Themes**

TYPES
 Chrome Apps
 Websites

CATEGORIES
All

FEATURES
 Runs Offline
 By Google
 Free
 Available for Android
 Works with Google Drive

RATINGS
 ★★★★★ (8,471)
 ★★★★★ (8,471)

Featured

UberConference Have A Better Meeting

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Postman **FREE**

YOU.DJ app **FREE**

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Kami - PDF and Document Markup **FREE**

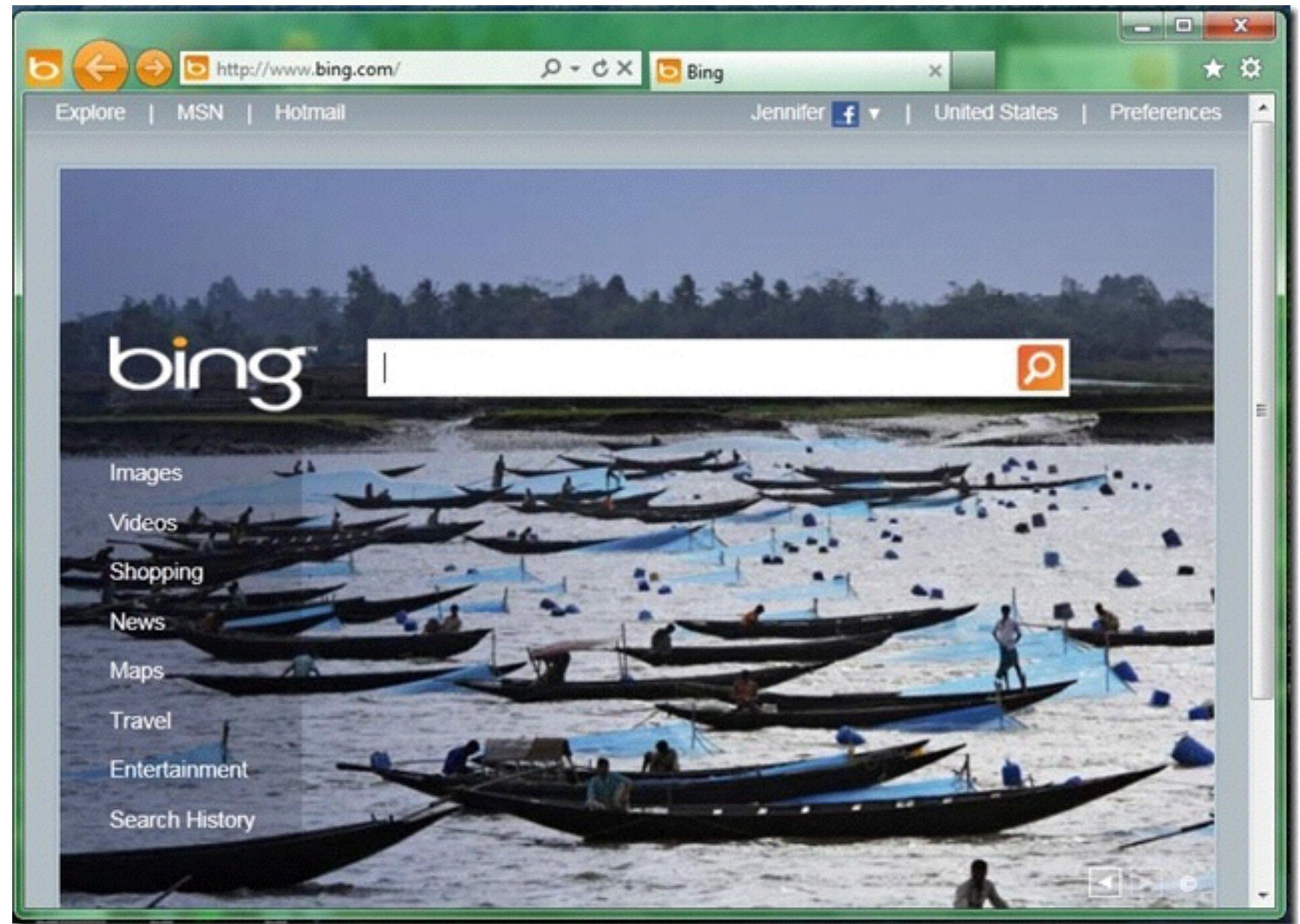
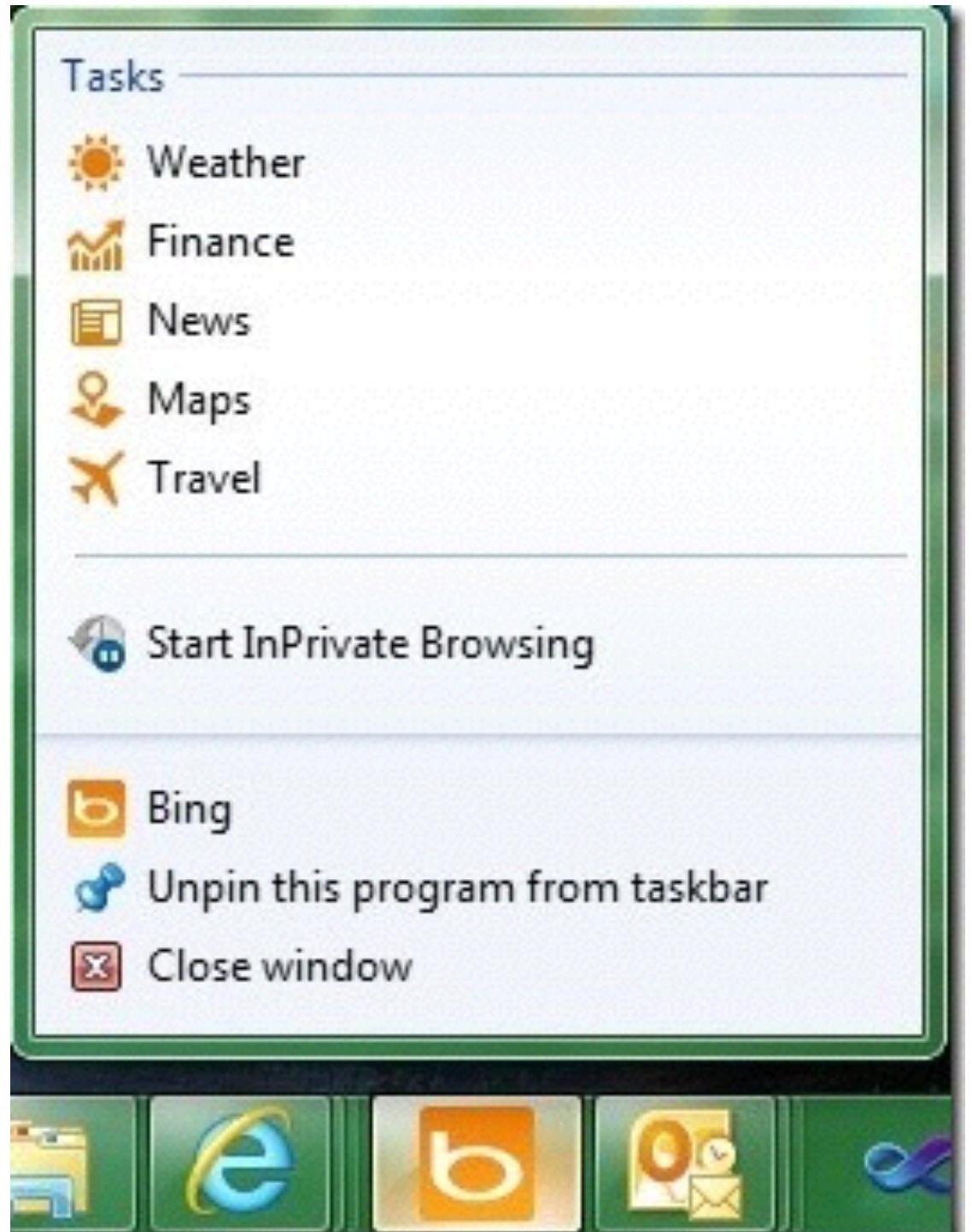
chrome.google.com/webstore/

Edit, Send

PINNED SITES

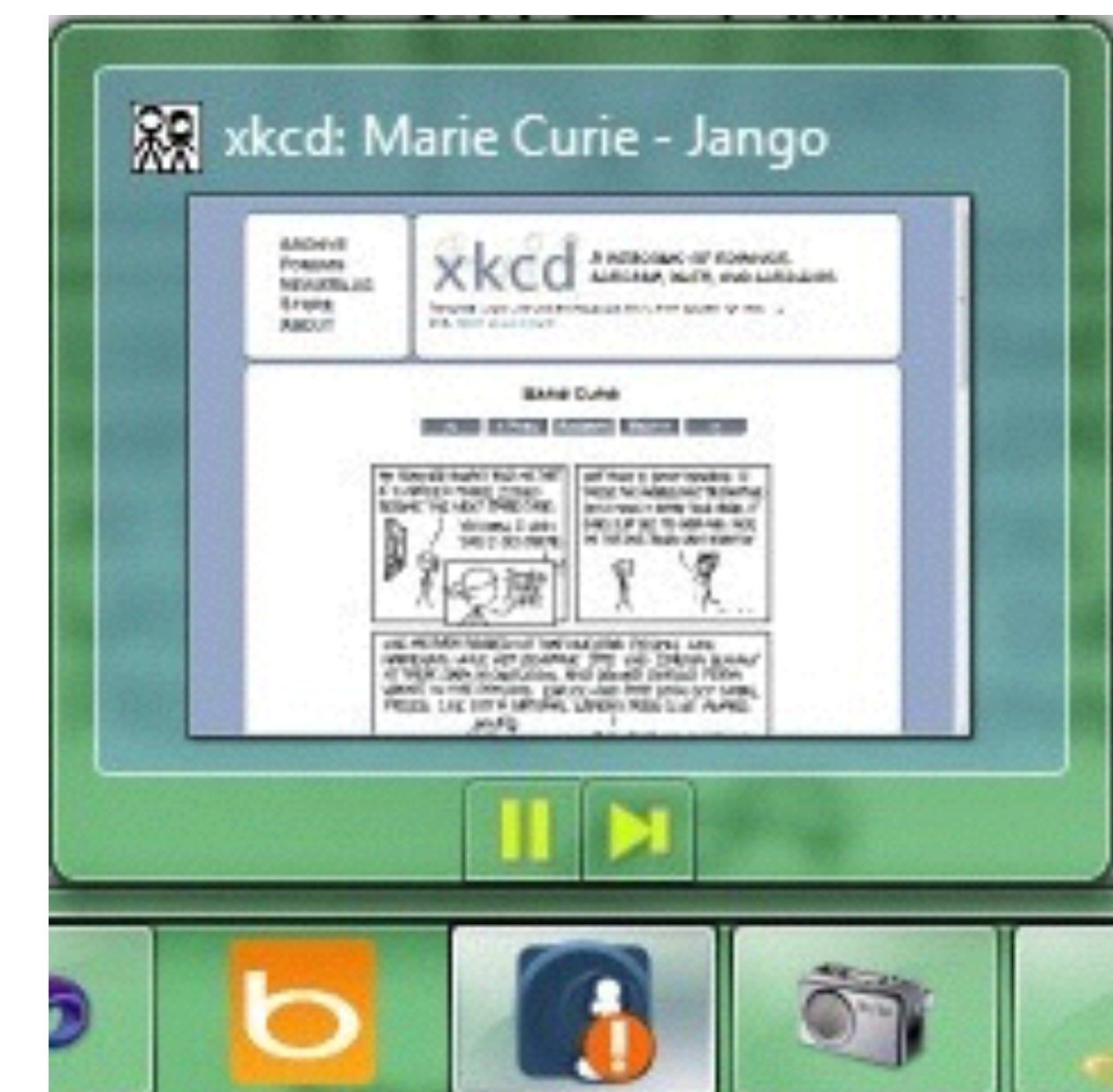


PINNED SITES, IE9 (2010)



[blogs.msdn.microsoft.com/jennifer/...](http://blogs.msdn.microsoft.com/jennifer/)

PINNED SITES, IE9 (2010)



[blogs.msdn.microsoft.com/jennifer/...](http://blogs.msdn.microsoft.com/jennifer/)

METRO APPS



METRO APPS, WIN8 (2012)



Tweetium

Timeline Connect Messages Trending Me Friends Seattle #Tweetium

Engadget now Sony's lucrative image sensor division is now a separate company engt.co/1FUu7sC



McAkins Online now Anyone else seeing 365 Activation issues with Office 2016? "Something went wrong..."

Tom Warren 28s Just bumped into @panos_panay. He's gonna be a busy man this morning

Brad Sams 3m Me walking to the Microsoft event: youtu.be/he67jW5sLBs

Stanislav Zhelyazkov 33m Microsoft® Azure Backup - microsoft.com/en-us/download... #MSOMS

Retweeted by MSFT Scripting Guys

Richard Hay 2m Bacon knocked out of the park Sheraton - thanks! #Breakfast



Maarten Goet 3m I really love #MSOMS. Lots of new features. Great use cases already! Have you tried it? oms.microsoft.com

Taylor Swift 3m Meredith is allergic to joy.



FIREFOX OS APPS





FIREFOX OS APPS (2013)



These applications can only be installed on devices running Firefox OS.
You may view the catalog but not be able to install or run these apps on your platform.

Great Games

2048
Maya Brick Breaker
Chocolate Jewels

Getting Around

SWOOOP
Fix-It Felix

Get Things Done

HERE Maps Online
traffc

Stopwatch
Productivity Utilities
★★★★★
Free

Firetext
Productivity Utilities
★★★★★
Free

Recorder
Music Utilities
★★★★★
Free

Calculator
Utilities
★★★★★
Free

FIREFOX OS APPS (2013)

"Built entirely using HTML5 and other open Web standards, Firefox OS is free from the rules and restrictions of existing proprietary platforms."

— Mozilla

HOSTED WEB APPS



HOSTED WEB APPS (2015)

Microsoft | Windows Dev Center

Home Explore < Docs < Downloads Samples Community Programs Dashboard

Code for one. Reach them all.

Get an early start building for Windows 10.

Learn how

STEP 1 OF 4
Where do you want to go?

Where do you want to go?
New York Chicago Seattle

Where do you want to go?
San Francisco New York Chicago Seattle

Where do you want to go?
Chicago New York Seattle

&&

TV icon

&&

Microchip icon

&&

Mobile phone icon

VR headset icon

&&

Game controller icon

developer.microsoft.com

HOSTED WEB APPS (2015)

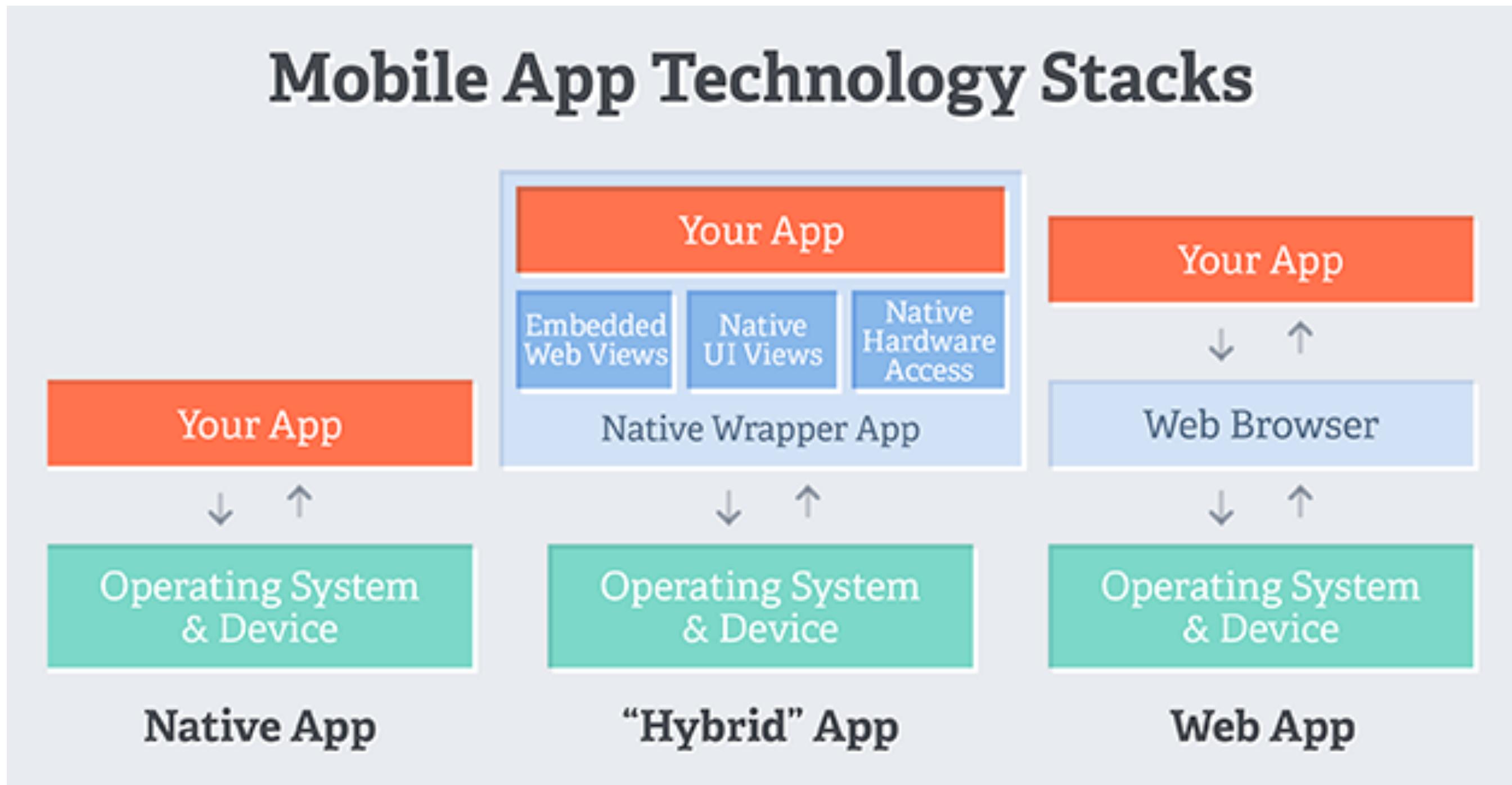
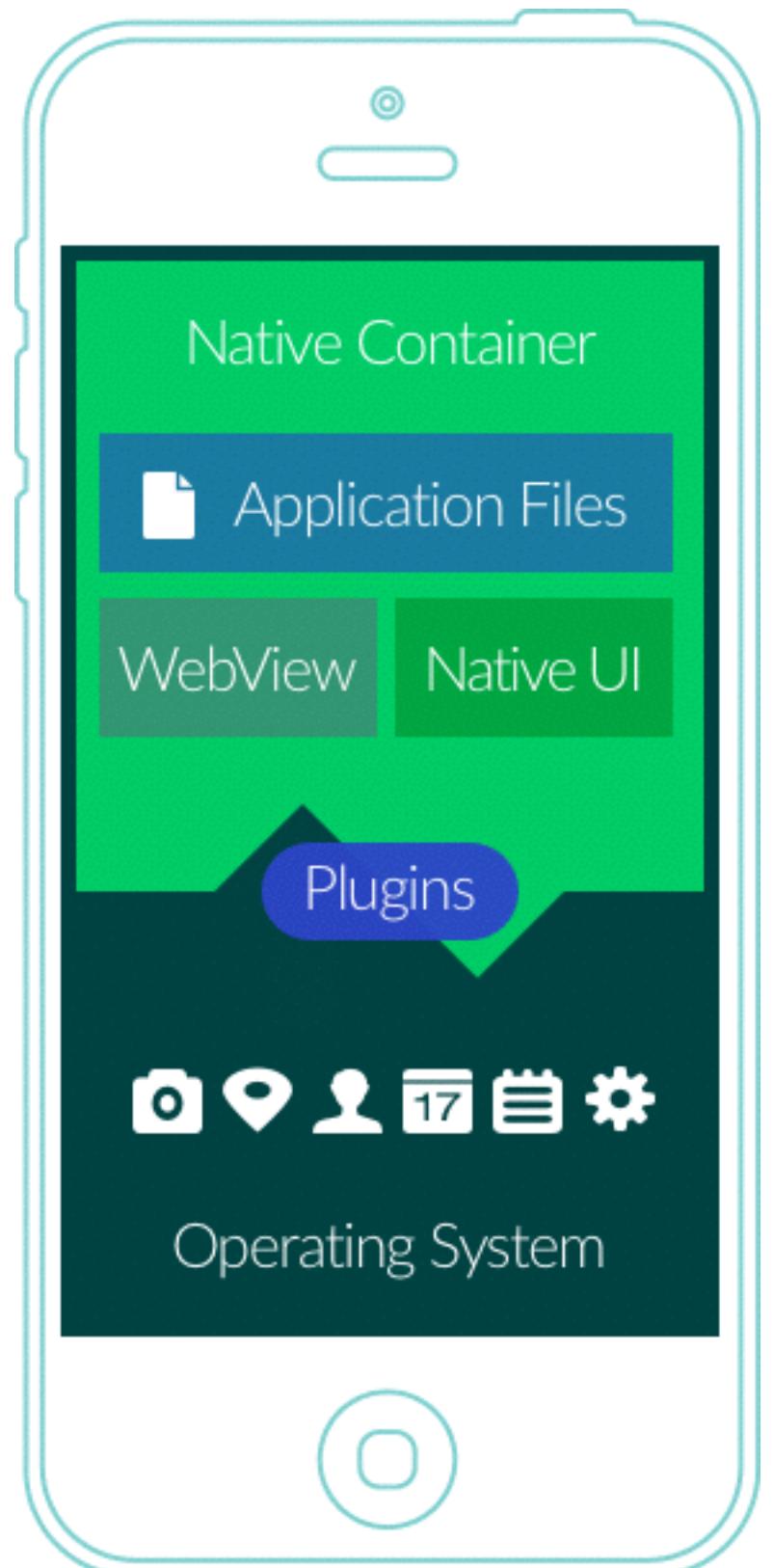


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    "sizes": "64x64"  
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HYBRID MOBILE APPS



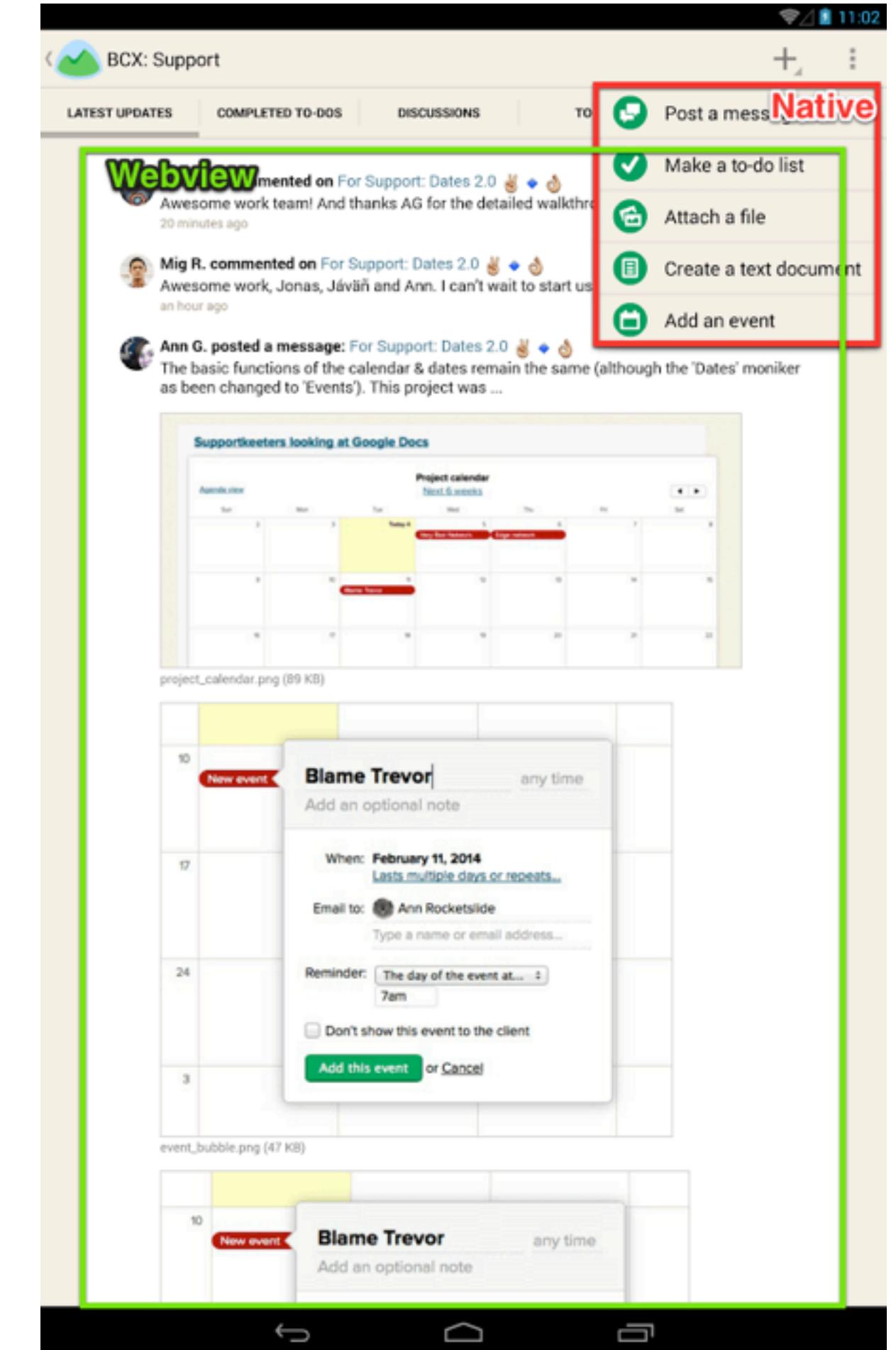
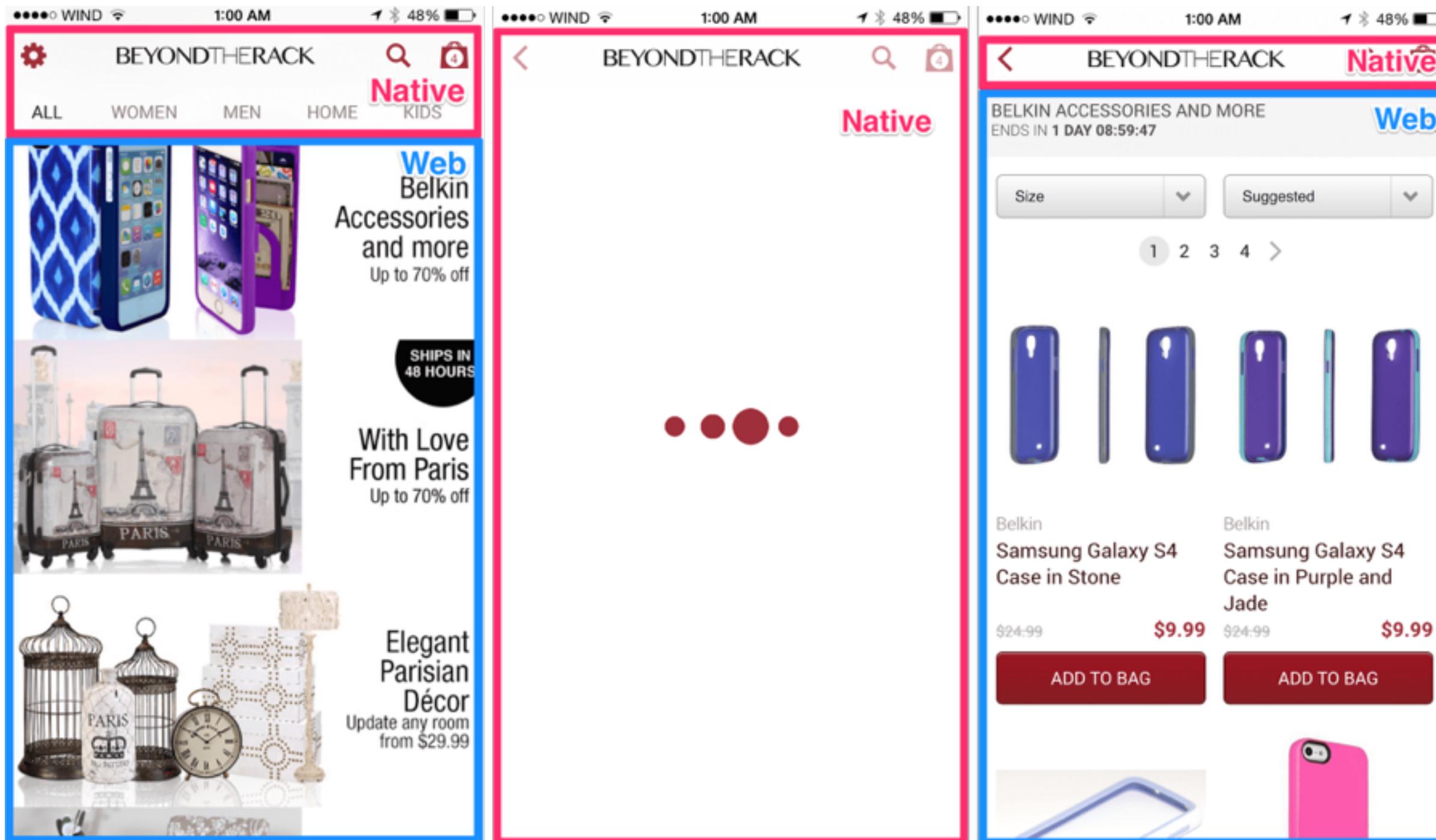
EMBEDDED WEB VIEWS



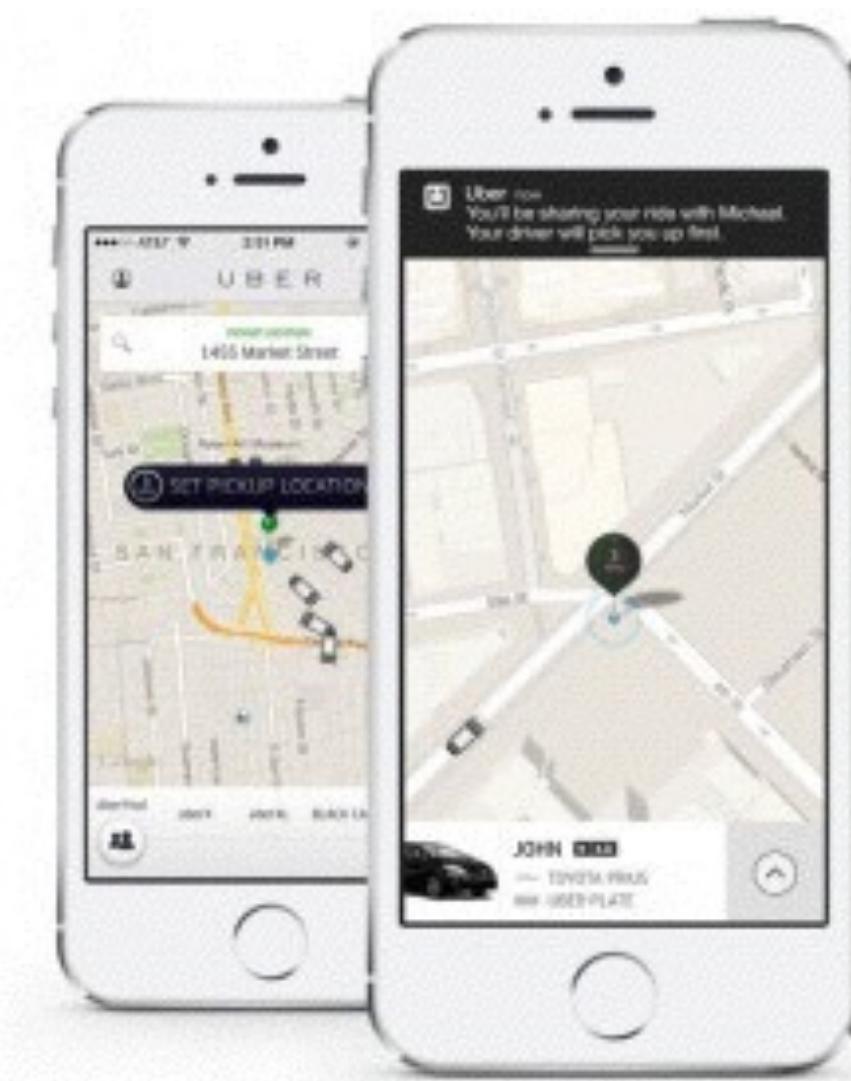
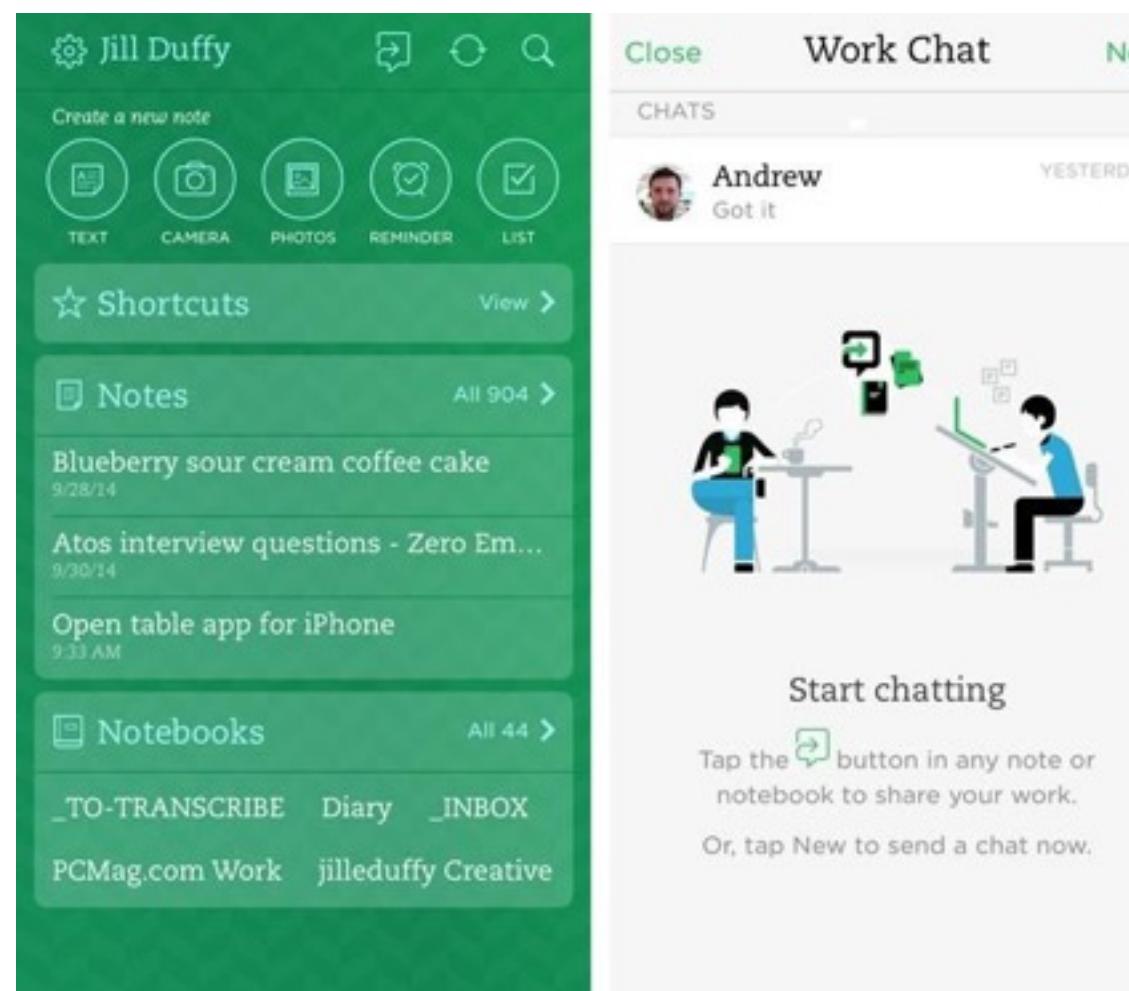
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telerik.com/featured/what-is-a-webview

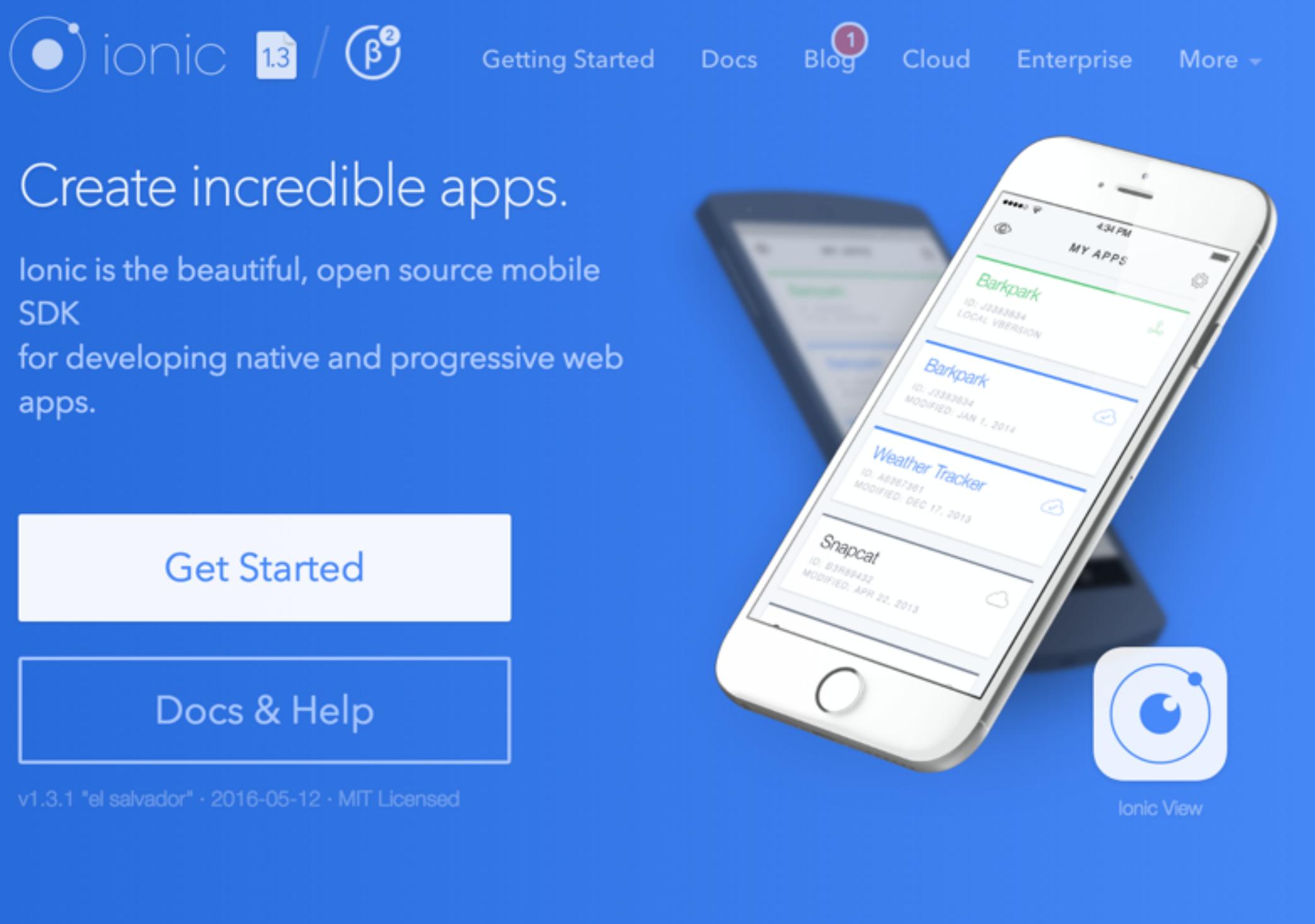
PART WEB, PART NATIVE



EXAMPLES

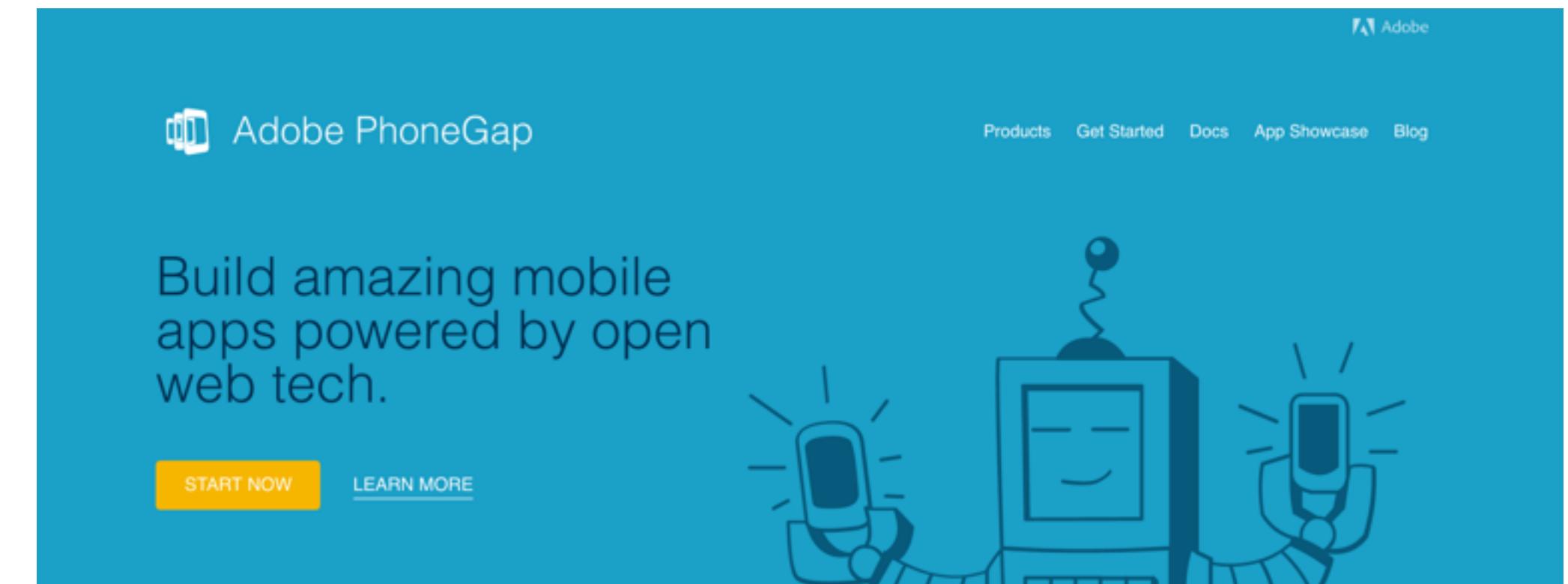


FRAMEWORKS

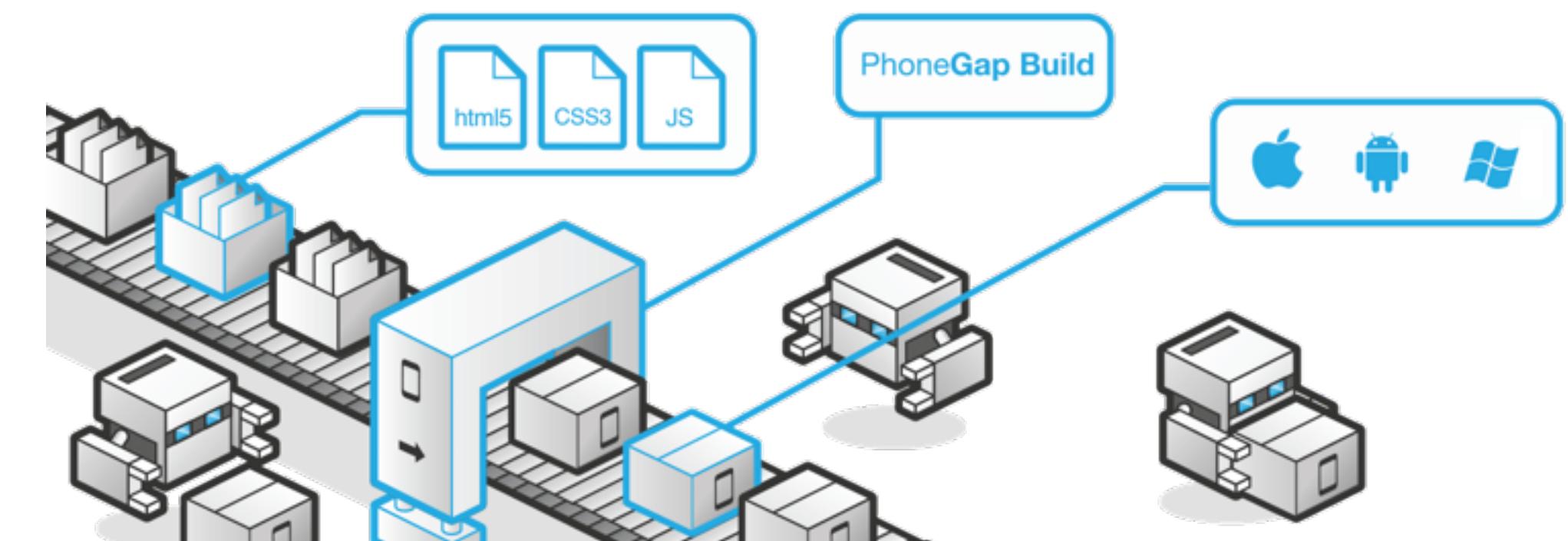


The Ionic Framework homepage features a blue header with the Ionic logo and version 1.3. A beta indicator shows 2 updates. The navigation bar includes links for Getting Started, Docs, Blog (with 1 update), Cloud, Enterprise, and More. Below the header, a large smartphone displays a mobile application interface with a list of apps like Barkpark, Weather Tracker, and Snapcat. To the left, a tablet shows a similar interface. A prominent call-to-action button says "Get Started". A "Docs & Help" button is also present. At the bottom, a footer note reads "v1.3.1 'el salvador' · 2016-05-12 · MIT Licensed".

ionicframework.com



The Adobe PhoneGap homepage has a teal header with the Adobe logo and a PhoneGap icon. The main title is "Adobe PhoneGap". Below it, a sub-headline says "Build amazing mobile apps powered by open web tech." Two buttons are visible: "START NOW" and "LEARN MORE". To the right, there's a cartoon illustration of three characters interacting with mobile devices. The navigation bar at the top includes links for Products, Get Started, Docs, App Showcase, and Blog.



phonegap.com

APACHE CORDOVA (2016-09)

Supported platforms [edit]

Apache Cordova currently supports development for the operating systems Apple iOS, Bada, BlackBerry, Firefox OS,^[30] Google Android,^[31] LG webOS, Microsoft Windows Phone (7 and 8), Nokia Symbian OS, Tizen (SDK 2.x), and Ubuntu Touch. The table below is a list of supported features for each operating system.^{[32][33]}

Feature	Android ^[34]	Apple iPhone /iPhone 3G	Apple iPhone 3GS and newer	Bada	BlackBerry 10 and PlayBook OS	BlackBerry OS 4.6–4.7	BlackBerry OS 5.0-6.0+	Firefox OS	Symbian	Tizen	webOS	Ubuntu Touch	Windows Phone
Accelerometer	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Camera	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compass	Yes	N/A	Yes	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes	Yes	Yes
Contacts	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	N/A	N/A	Yes
File	Yes	Yes	Yes	N/A	Yes	N/A	Yes	N/A	N/A	Yes	N/A	Yes	Yes
Geolocation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Media	Yes	Yes	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Yes	N/A	Yes	Yes
Network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Notification (alert, sound, vibration)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storage	Yes	Yes	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

ELECTRON APPS

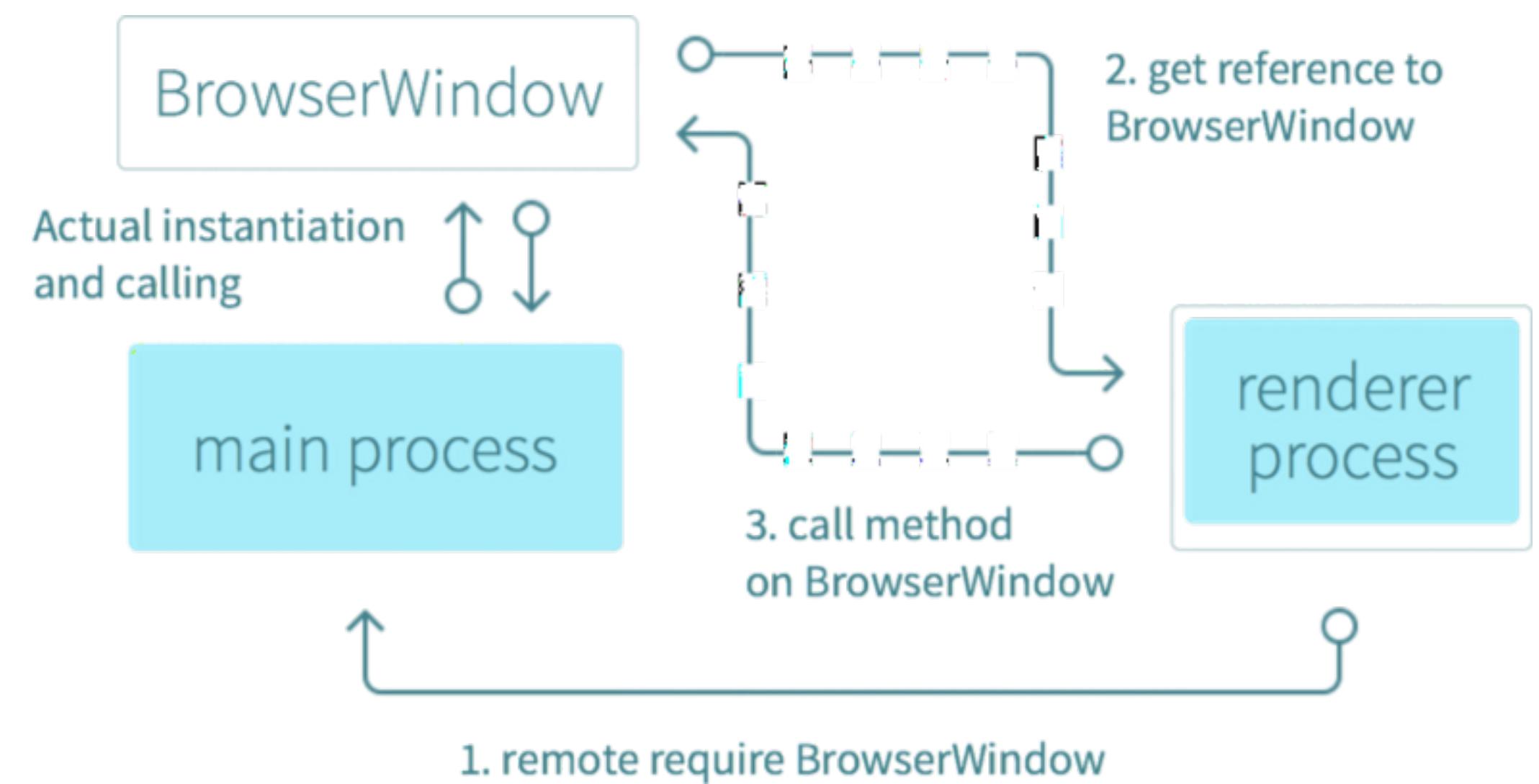
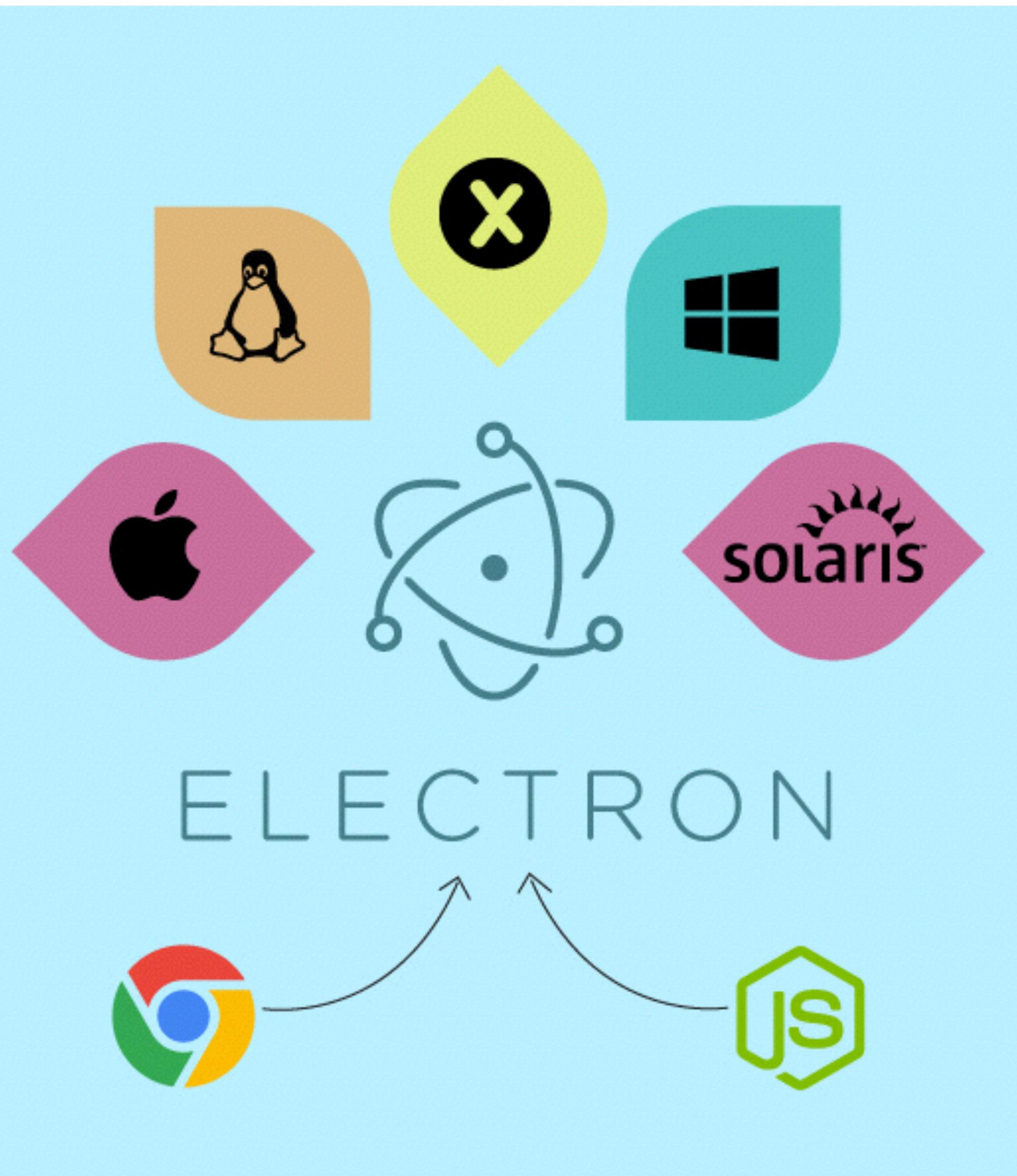




Build cross platform desktop apps
with JavaScript, HTML, and CSS

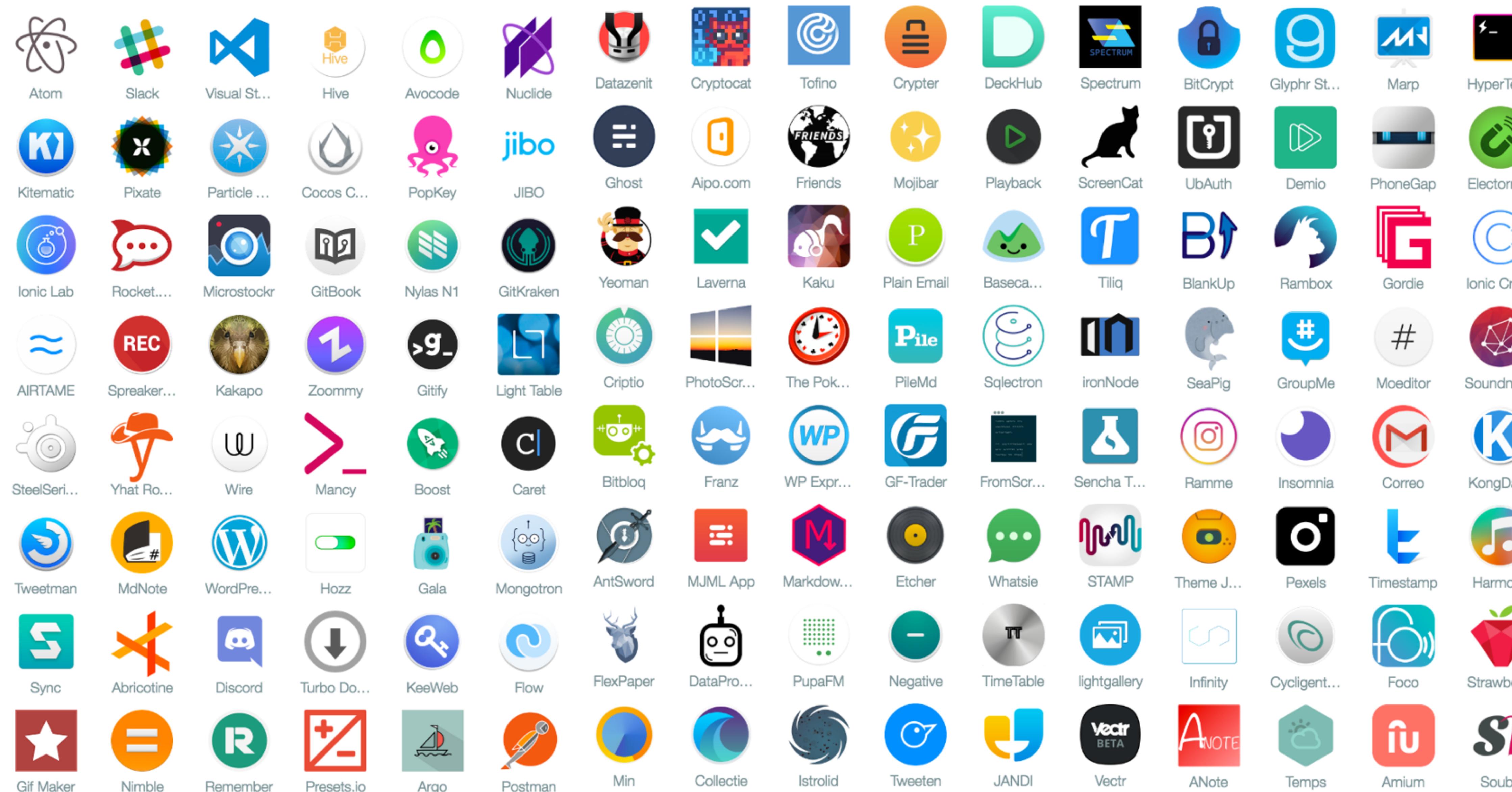
electron.atom.io

NODE JS + CHROMIUM

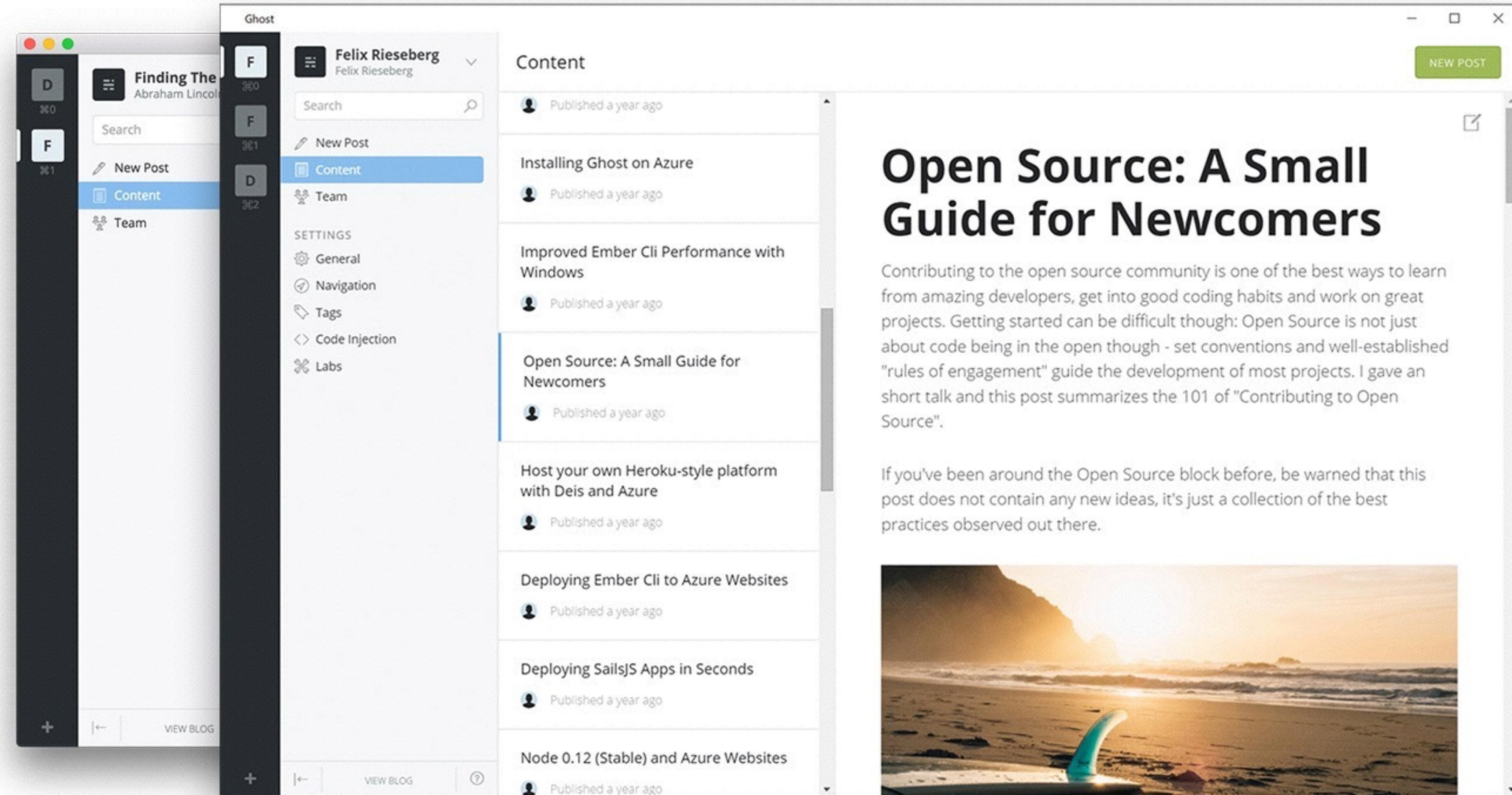


medium.com/developers-writing
medium.com/front-end-hacking

EXAMPLES



EXAMPLE: GHOST



github.com/tryghost/ghost-desktop

EXAMPLE: MOJIBAR

The screenshot shows the Mojibar application window. At the top, there's a toolbar with various icons: a document, a circle, a triangle, a double arrow, a square, a cloud, a star, a circle with a dot, a speaker, a Wi-Fi signal, a bold A, and a battery level. To the right of the icons, it says "Tue 11:29 PM". Below the toolbar is a header bar with three colored dots (red, yellow, green) on the left and a "+" icon on the right. The main area has tabs for "Write" (selected), "Preview", and "Styling with Markdown is supported". The "Write" tab contains several text snippets with keyboard shortcuts highlighted in blue:

- `ctrl + shift + space` to open the app (customisable).
- `cmd + ,` to open preference.
- `/` to focus on the search field, arrow keys to select emoji.
- `enter` to copy unicode:
- `shift + enter` to copy text:
- `cmd + q` to quit app.

WHAT WEB CAN DO TODAY



CHROME, ANDROID (2016-09)

Native Behaviors	Seamless Experience	Camera & Microphone	Location & Position
<ul style="list-style-type: none">LOCAL NOTIFICATIONS ✓PUSH MESSAGES ✓FOREGROUND DETECTION ✓PERMISSIONS ✓	<ul style="list-style-type: none">OFFLINE MODE ✓HOME SCREEN INSTALLATIONBACKGROUND SYNC ✓INTER-APP COMMUNICATION ✘	<ul style="list-style-type: none">AUDIO & VIDEO CAPTURE ✓ADVANCED CAMERA CONTROLS ✘RECORDING MEDIA ✓REAL-TIME COMMUNICATION ✓	<ul style="list-style-type: none">GEOLOCATION ✓GEOFENCING ✘DEVICE ORIENTATION ✓DEVICE MOTIONS ✓
Input	Surroundings	Device Features	Screen & Output
<ul style="list-style-type: none">TOUCH GESTURES ✓SPEECH RECOGNITION ✓CLIPBOARD (COPY & PASTE) ✓POINTING DEVICE ADAPTATION ✓	<ul style="list-style-type: none">BLUETOOTH ✓NFC ✘PROXIMITY SENSORS ✘AMBIENT LIGHT ✘	<ul style="list-style-type: none">NETWORK TYPE & SPEED ✓ONLINE STATE ✓VIBRATION ✓BATTERY STATUS ✓	<ul style="list-style-type: none">FULLSCREEN ✓SCREEN ORIENTATION & LOCK ✓WAKE LOCK ✘PRESENTATION FEATURES ✓
 What Web Can Do Today Can I rely on the Web Platform features to build my app? An overview of the device integration HTML5 APIs	Operating System		
<p>✓ Feature available in your current browser ✘ Feature not available in your current browser</p>	<ul style="list-style-type: none">OFFLINE STORAGE ✓FILE ACCESS ✓CONTACTS ✘STORAGE QUOTAS ✓		

SAFARI, IOS (2016-09)

Native Behaviors	Seamless Experience	Camera & Microphone	Location & Position
LOCAL NOTIFICATIONS ✗ » PUSH MESSAGES ✗ » FOREGROUND DETECTION ✓ » PERMISSIONS ✗ »	OFFLINE MODE ✗ » HOME SCREEN INSTALLATION » BACKGROUND SYNC ✗ » INTER-APP COMMUNICATION ✗ »	AUDIO & VIDEO CAPTURE ✗ » ADVANCED CAMERA CONTROLS ✗ » RECORDING MEDIA ✗ » REAL-TIME COMMUNICATION ✗ »	GEOLOCATION ✓ » GEOFENCING ✗ » DEVICE ORIENTATION ✓ » ACCELEROMETER ✓ »

Input	Surroundings	Device Features	Screen & Output
TOUCH GESTURES ✓ » SPEECH RECOGNITION ✗ » CLIPBOARD (COPY & PASTE) ✓ » POINTING DEVICE ADAPTATION ✗ »	BLUETOOTH ✗ » NFC ✗ » PROXIMITY SENSORS ✗ » AMBIENT LIGHT ✗ »	NETWORK TYPE & SPEED ✗ » ONLINE STATE ✓ » VIBRATION ✗ » BATTERY STATUS ✗ »	FULLSCREEN ✗ » SCREEN ORIENTATION & LOCK ✗ » WAKE LOCK ✗ » PRESENTATION FEATURES ✗ »



What Web Can Do Today

Can I rely on the Web Platform features to build my app?
An overview of the device integration HTML5 APIs

✓ Feature available in your current browser

✗ Feature not available in your current browser

Operating System
OFFLINE STORAGE ✓ » FILE ACCESS ✓ » CONTACTS ✗ » STORAGE QUOTAS ✗ »

PROGRESSIVE WEB APPS



PROGRESSIVE WEB APPS?

use the

latest web technologies

to create a

1st class app experience

THE PWA PROMISE

Progressive

Discoverable

Linkable

Responsive

Connectivity independent

Re-engageable

Installable

Fresh

Safe

STARTS AS WEBSITE

https://en.wikipedia.org/wiki/Progressive_web_app

WIKIPEDIA
The Free Encyclopedia

Article Talk

Read Edit View history Search

Not logged in Talk Contributions Create account Log in

Progressive web app

From Wikipedia, the free encyclopedia

Progressive Web App (PWA) is a term used to denote a new software development methodology. Unlike traditional applications, Progressive Web App can be seen as an evolving hybrid of regular web pages (or websites) and a mobile application. This new application life-cycle model combines features offered by most modern browsers with benefits of mobile experience.

Contents [hide]

- 1 Overview
 - 1.1 Dynamic and Responsive Web
 - 1.2 Internet browsers
 - 1.3 Mobile devices
 - 1.4 Raising Mobile UX Aspirations
- 2 Progressive Web Apps
- 3 Characteristics
- 4 Technologies
- 5 Manifest
- 6 Service Workers
- 7 Application Shell Architecture
- 8 References

Overview [edit]

Ever since 2005 the Internet has been rapidly evolving: from static websites to dynamic web pages through Ajax [1] and responsive web design [2] at its stack.

Dynamic and Responsive Web [edit]

The web development technologies shifted, from static HTML documents to dynamic PHP, ASP.NET, Ajax, and various server side and client device-based languages and scripts. Eventually, RWD (Responsive Web Design) evolved due to game-changing features introduced in HTML5, CSS3, and JavaScript. This powerful combination of markup, styling sheets, and scripts enabled custom interactions with page elements, rendering videos without Macromedia Flash, playing games - all these on client-device (not server) side. Newly released CSS3 and JavaScript frameworks changed design patterns and philosophy; with box model followed by grids and flex, accompanied by translations, transformations, animations - new approach to styles still defines the visual layer of the Internet.

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia
Wikipedia store

Interaction
Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools
What links here
Related changes
Upload file
Special pages
Permanent link
Wikidata item
Cite this page

Print/export
Create a book
Download as PDF
Printable version

Languages
Deutsch

Edit links

<https://www.pokedex.org>

Pokédex.org

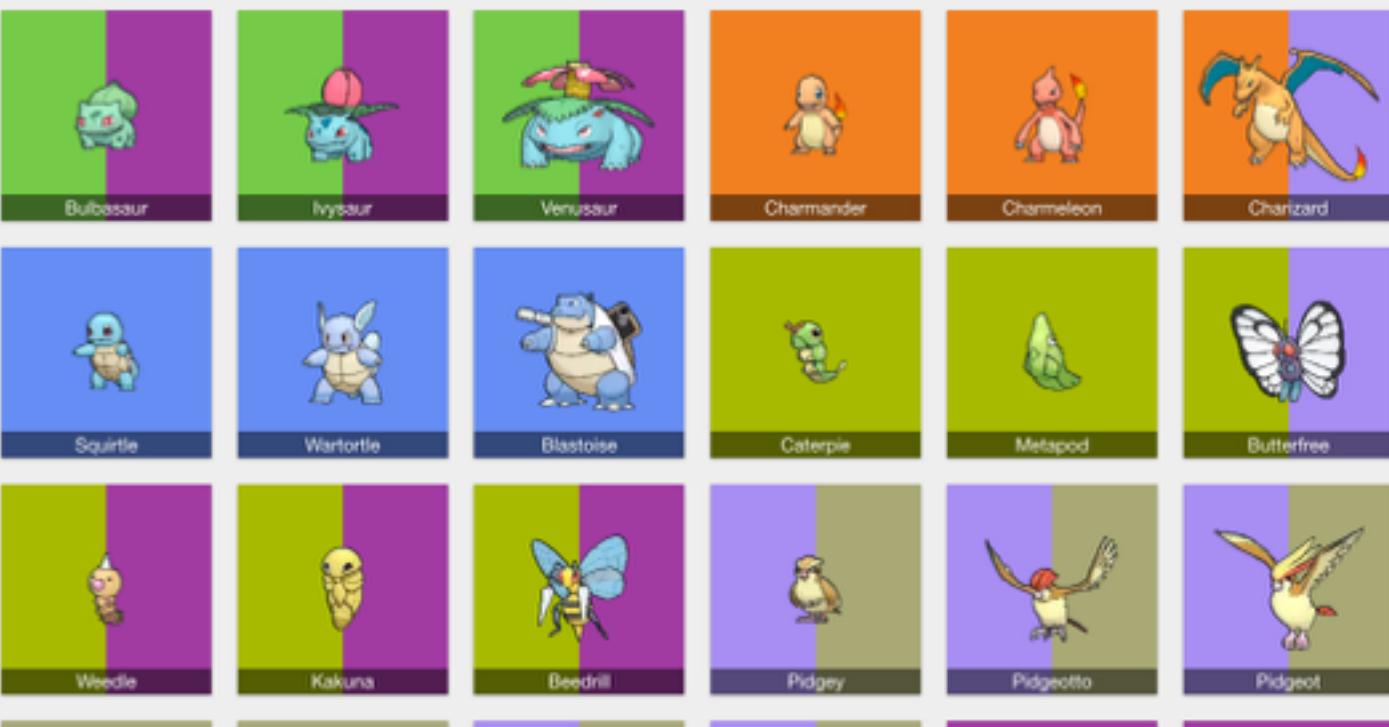
Pokémon About

Search for Pokémons

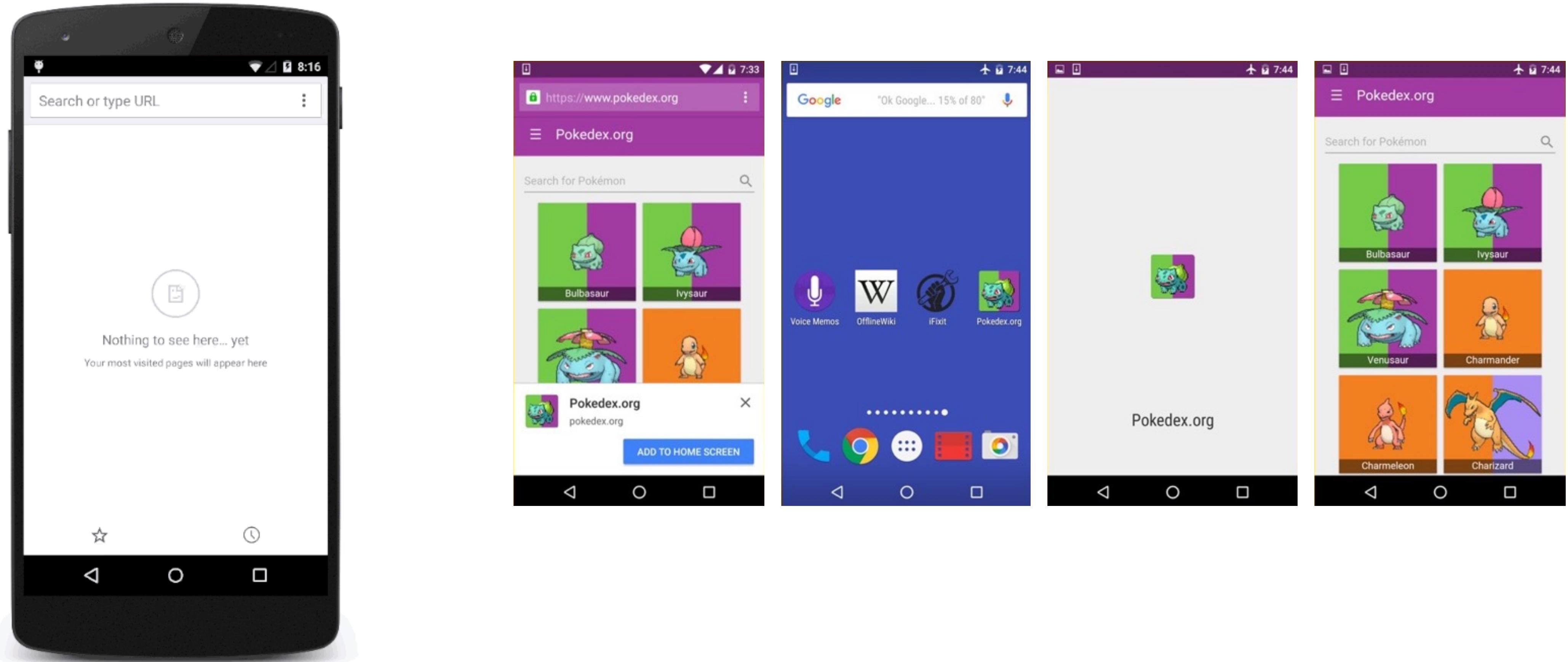
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Squirtle Wartortle Blastoise Caterpie Metapod Butterfree

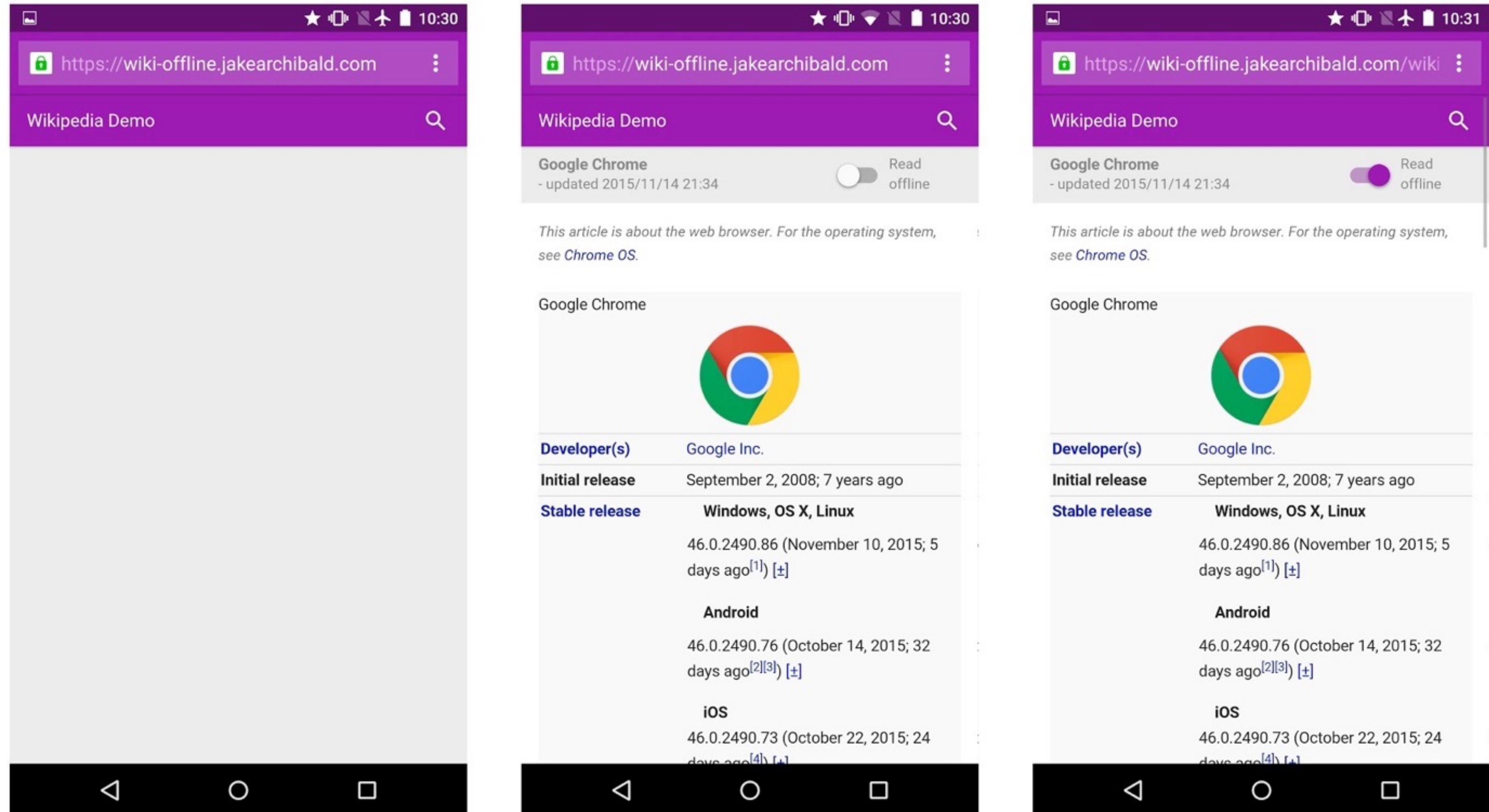
Weedle Kakuna Beedrill Pidgey Pidgeotto Pidgeot



ADD TO HOMESCREEN

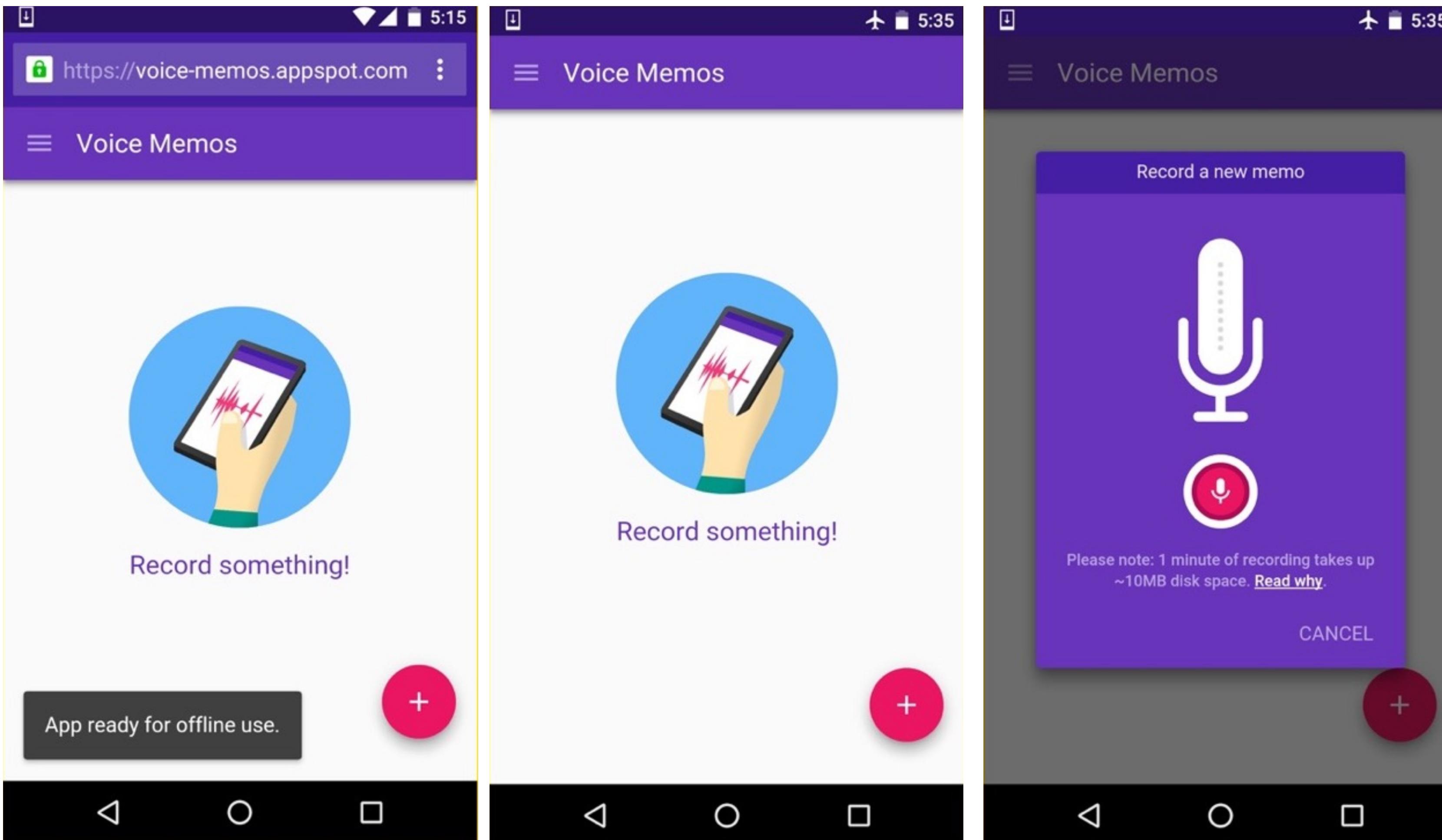


OFFLINE SUPPORT

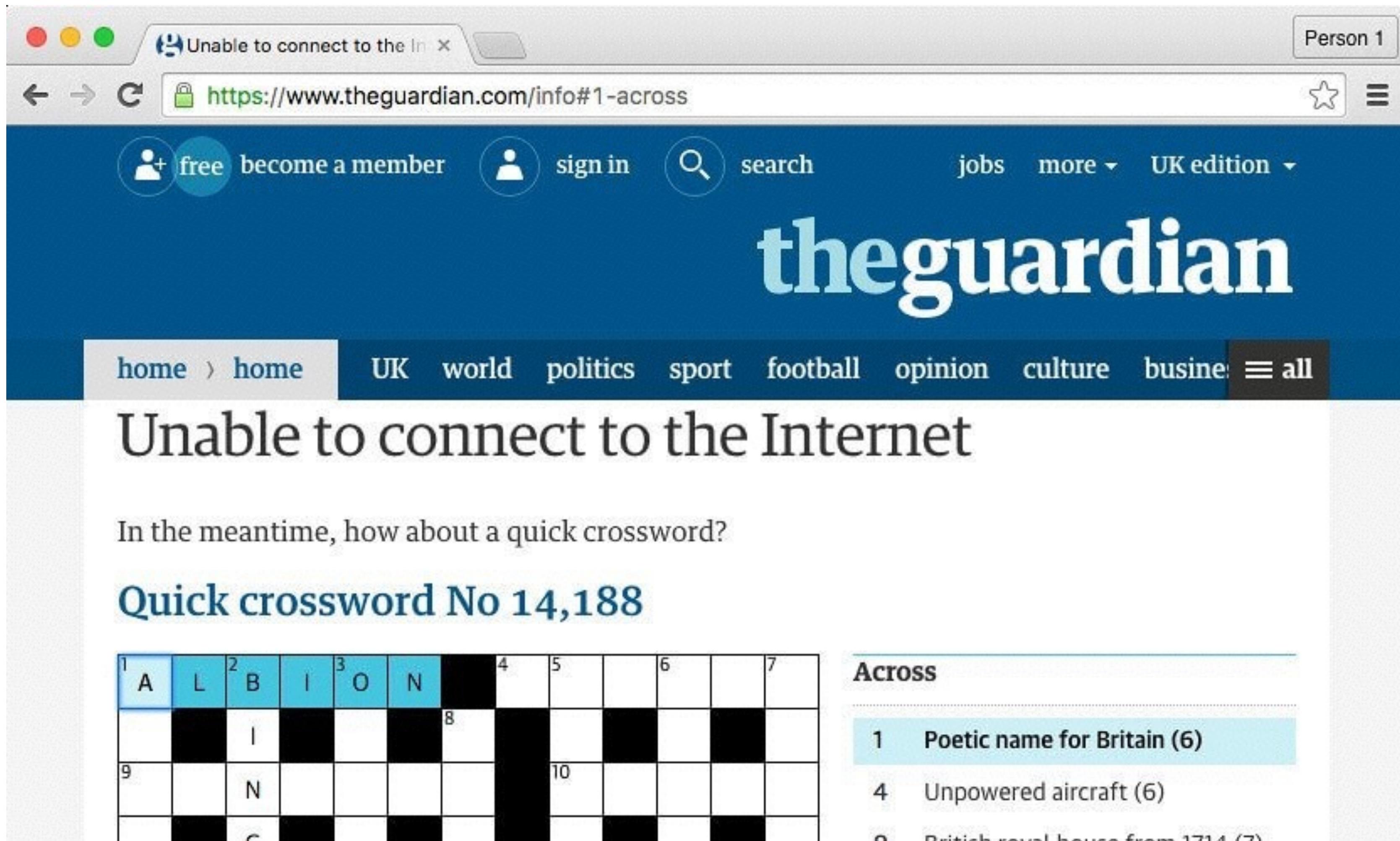


developers.google.com/web

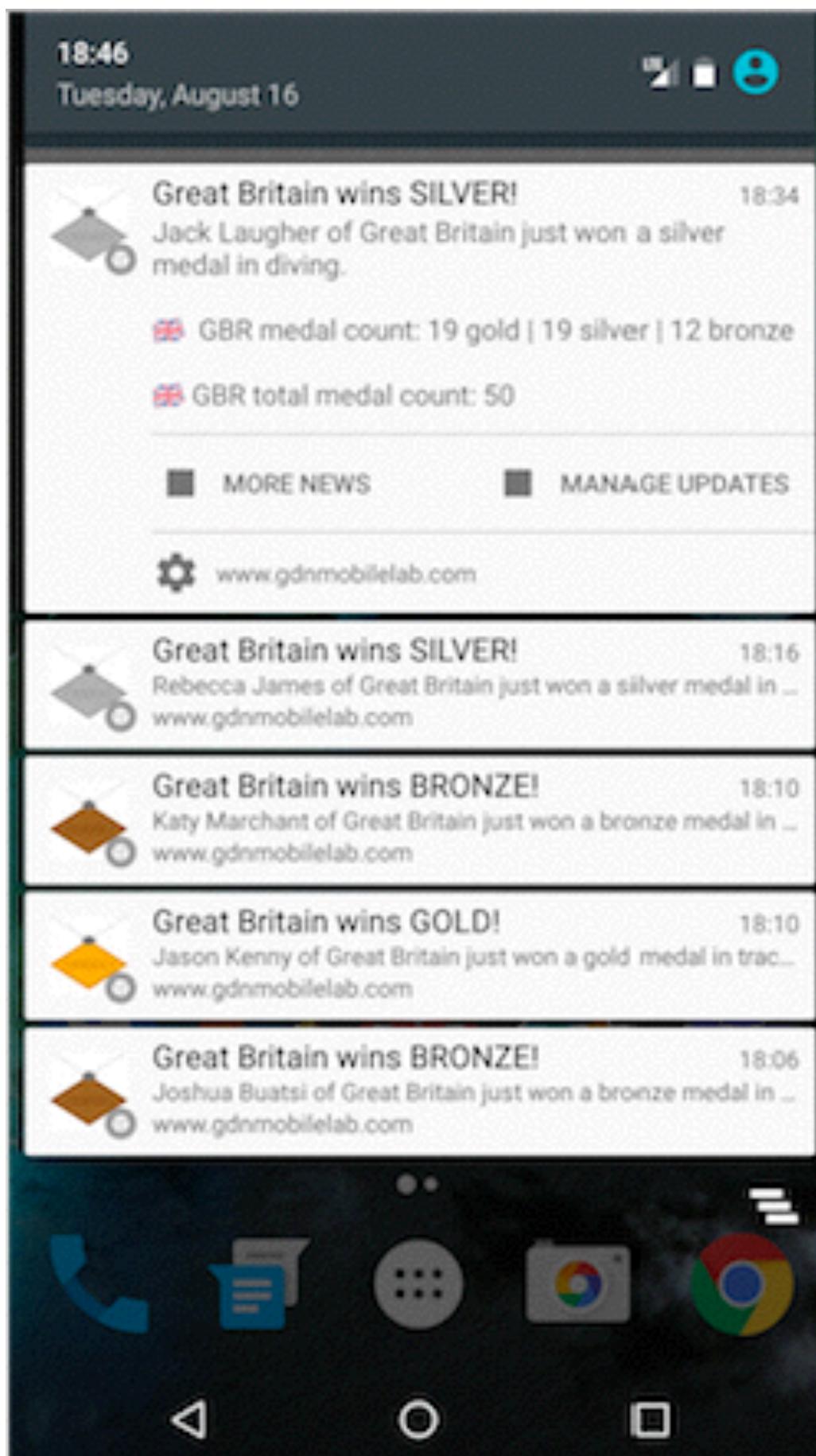
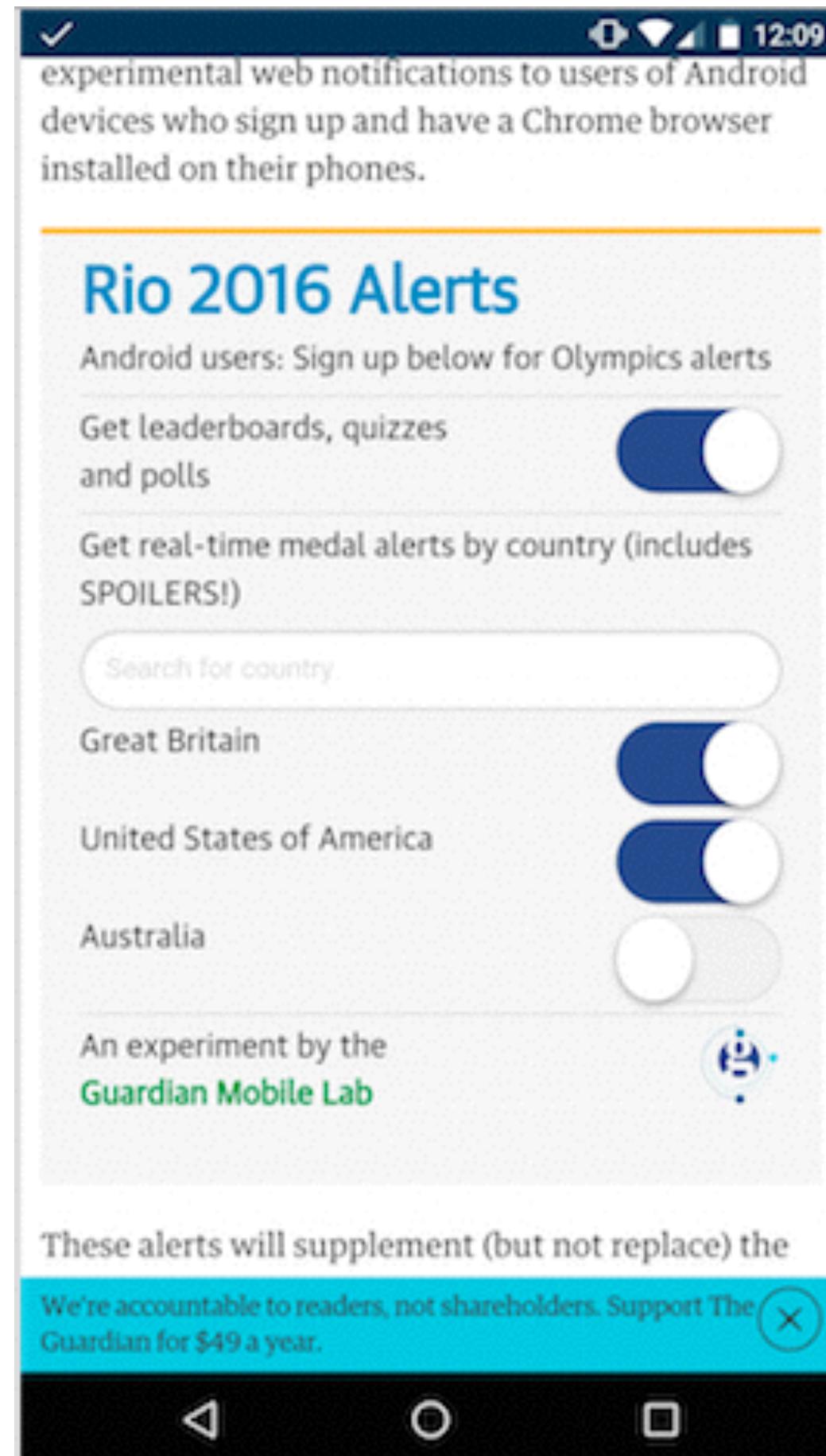
OFFLINE SUPPORT



OFFLINE SUPPORT



PUSH NOTIFICATIONS



Users tapped the action button to start the quiz

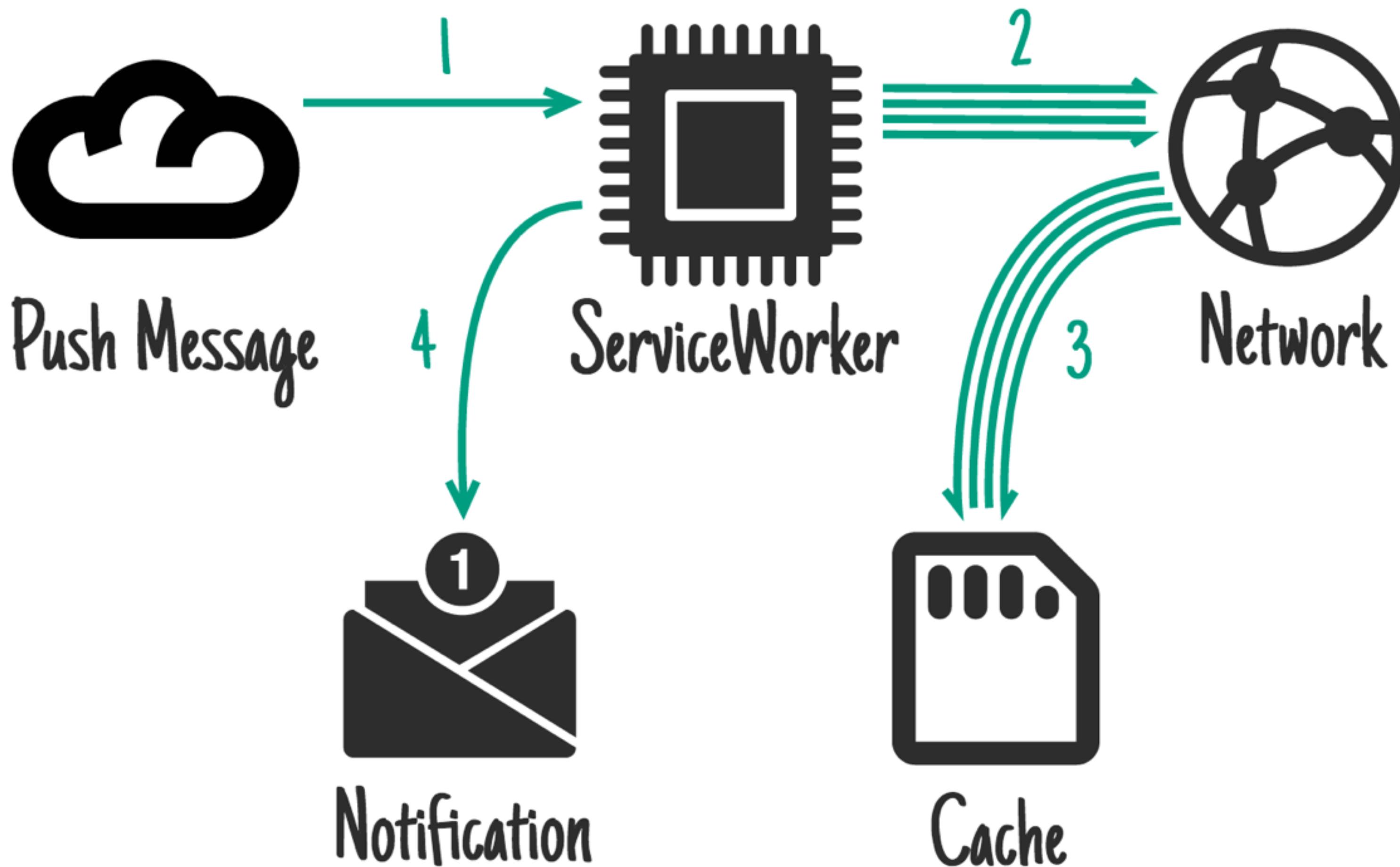


Users tapped on the action button with their answer



The answer was revealed before going to the next question

PUSH NOTIFICATIONS



BACKGROUND SYNC

You are currently offline. Any requests made will be queued and synced as soon as you go online again.

Click on the button below to make an HTTP request.

HTTP Request is queued

Make an HTTP request - do it!

The Network tab of the developer tools shows a single request for "doge.png" from "deanhume.github.io". The status is "304 Not Mod.". The "Status Text" column shows "304 Not Mod.". The "Domain" column shows "deanhume.github.io". The "Type" column shows "p...". The "Initi..." column shows "Oth...". The "Size Content" column shows "334 B" and "342 KB". The "Time Latency" column shows "250 ms" and "234 ms".

You are currently online!

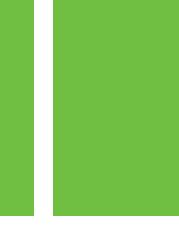
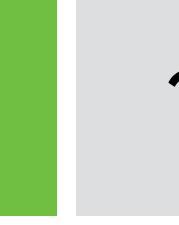
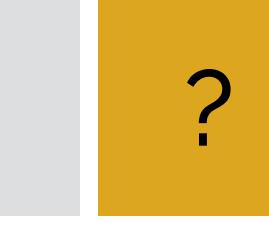
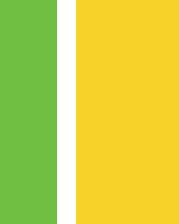
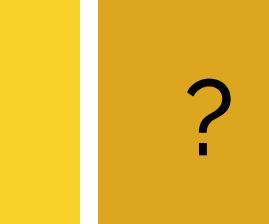
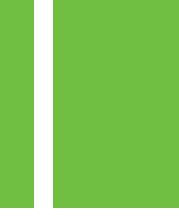
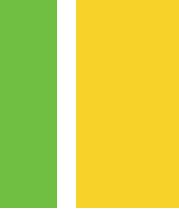
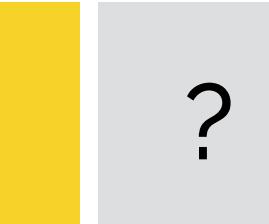
Click on the button below to make an HTTP request.

HTTP Request is made

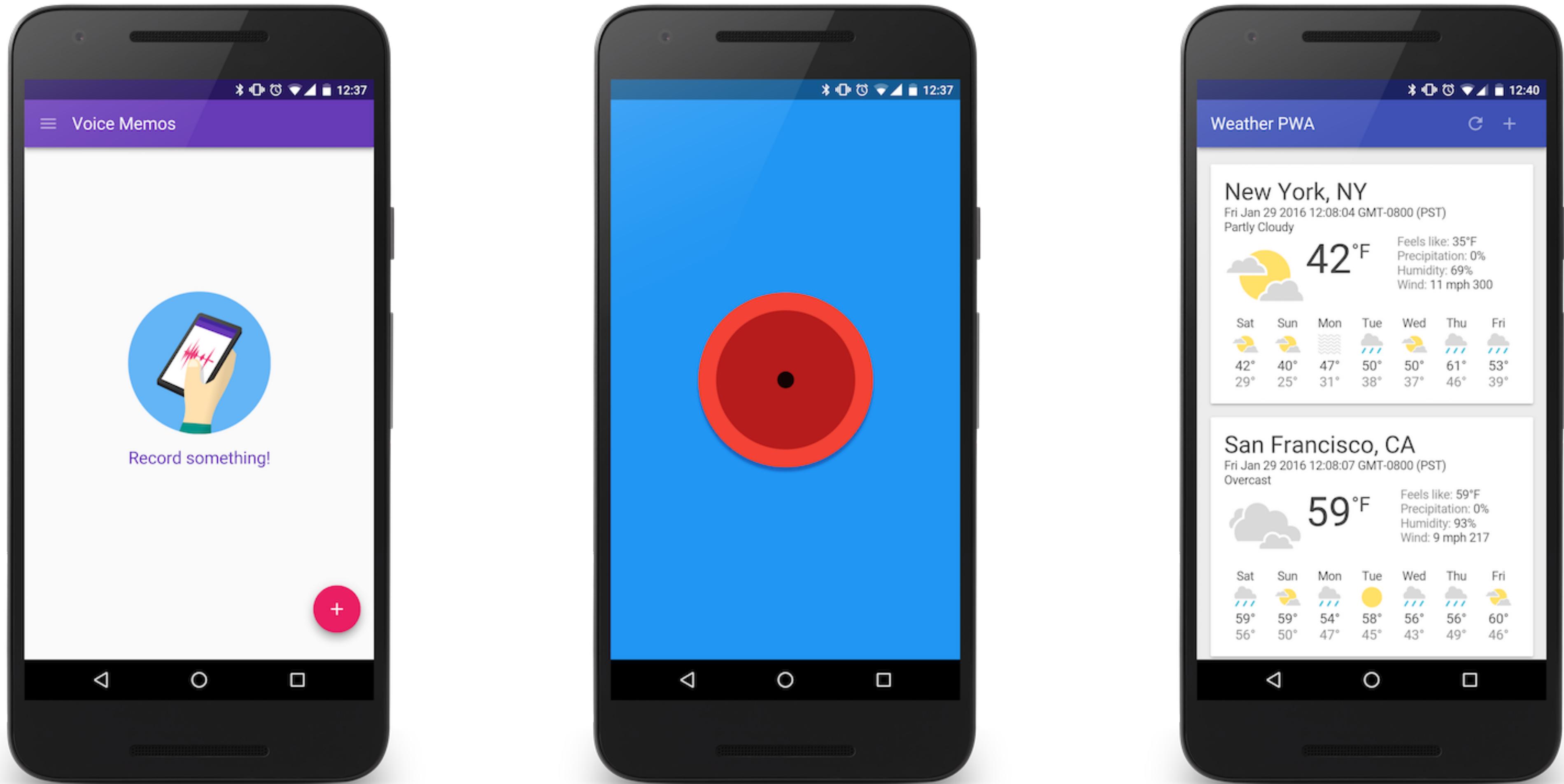
Make an HTTP request - do it!

The Network tab of the developer tools shows the same request for "doge.png" from "deanhume.github.io". The status is "304 Not Mod.". The "Status Text" column shows "304 Not Mod.". The "Domain" column shows "deanhume.github.io". The "Type" column shows "p...". The "Initi..." column shows "Oth...". The "Size Content" column shows "334 B" and "342 KB". The "Time Latency" column shows "250 ms" and "234 ms".

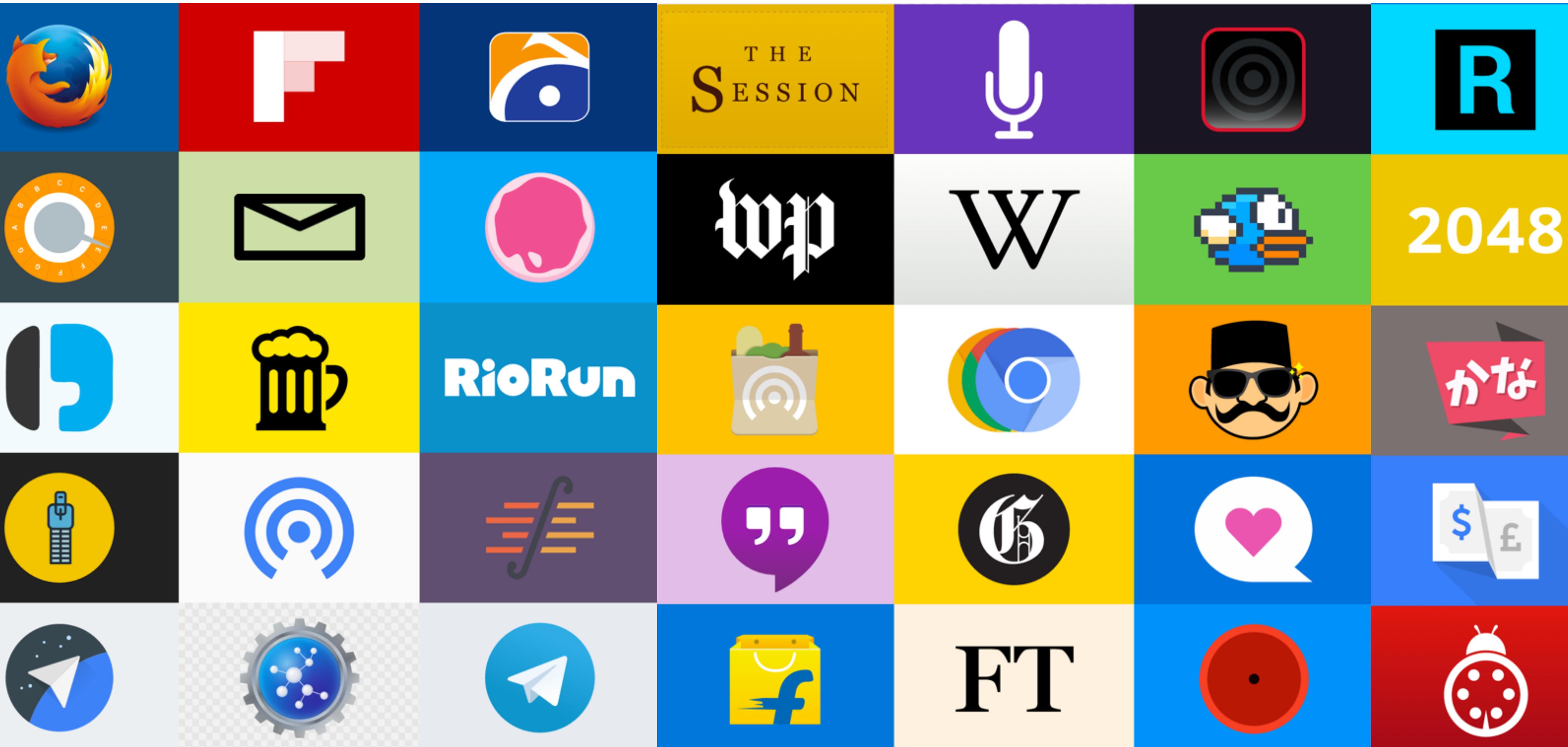
BROWSER SUPPORT (2016-09)

	mobile			desktop		
						
homescreen & standalone						
offline						
push notifications						
background sync						
store						

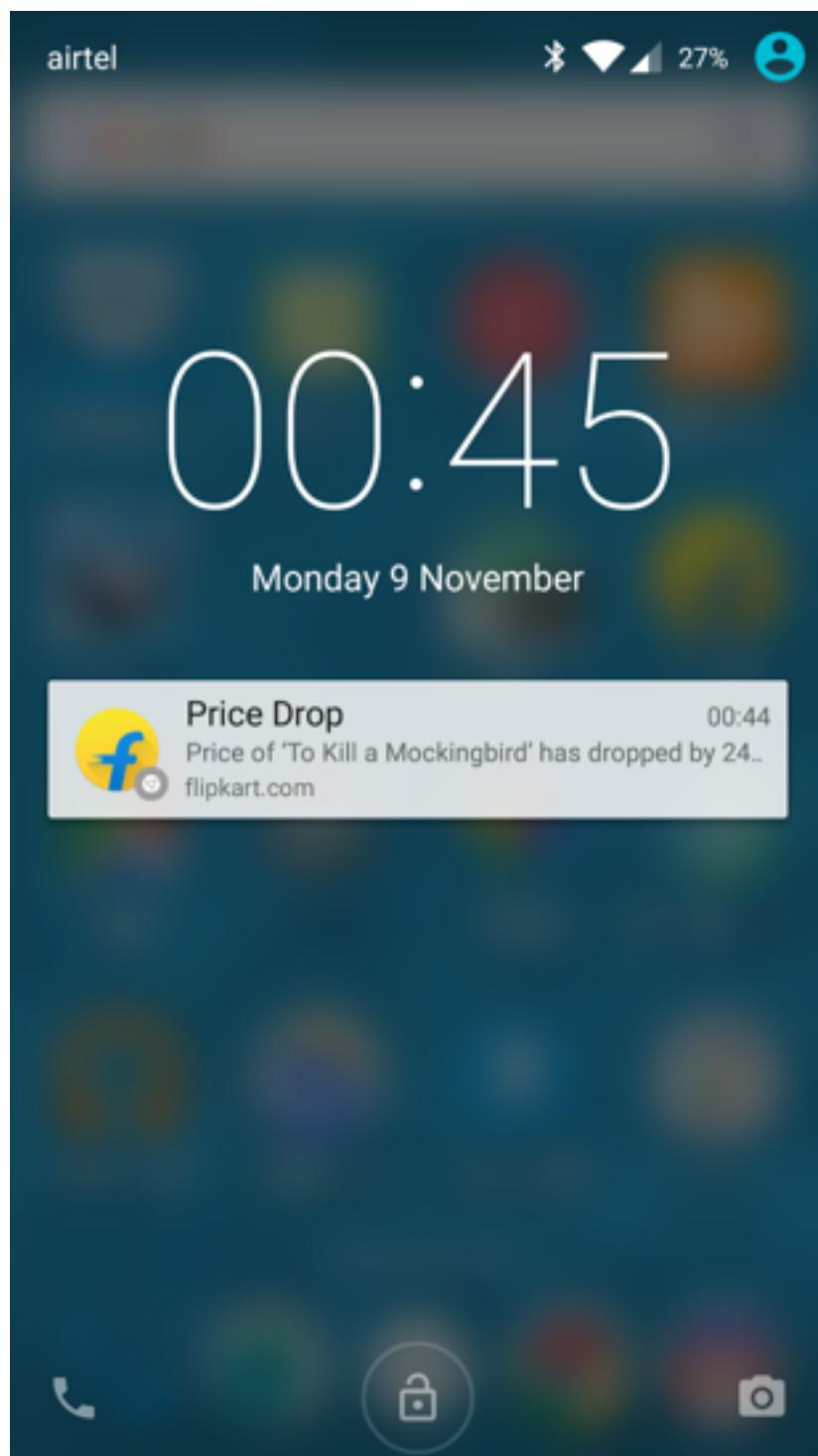
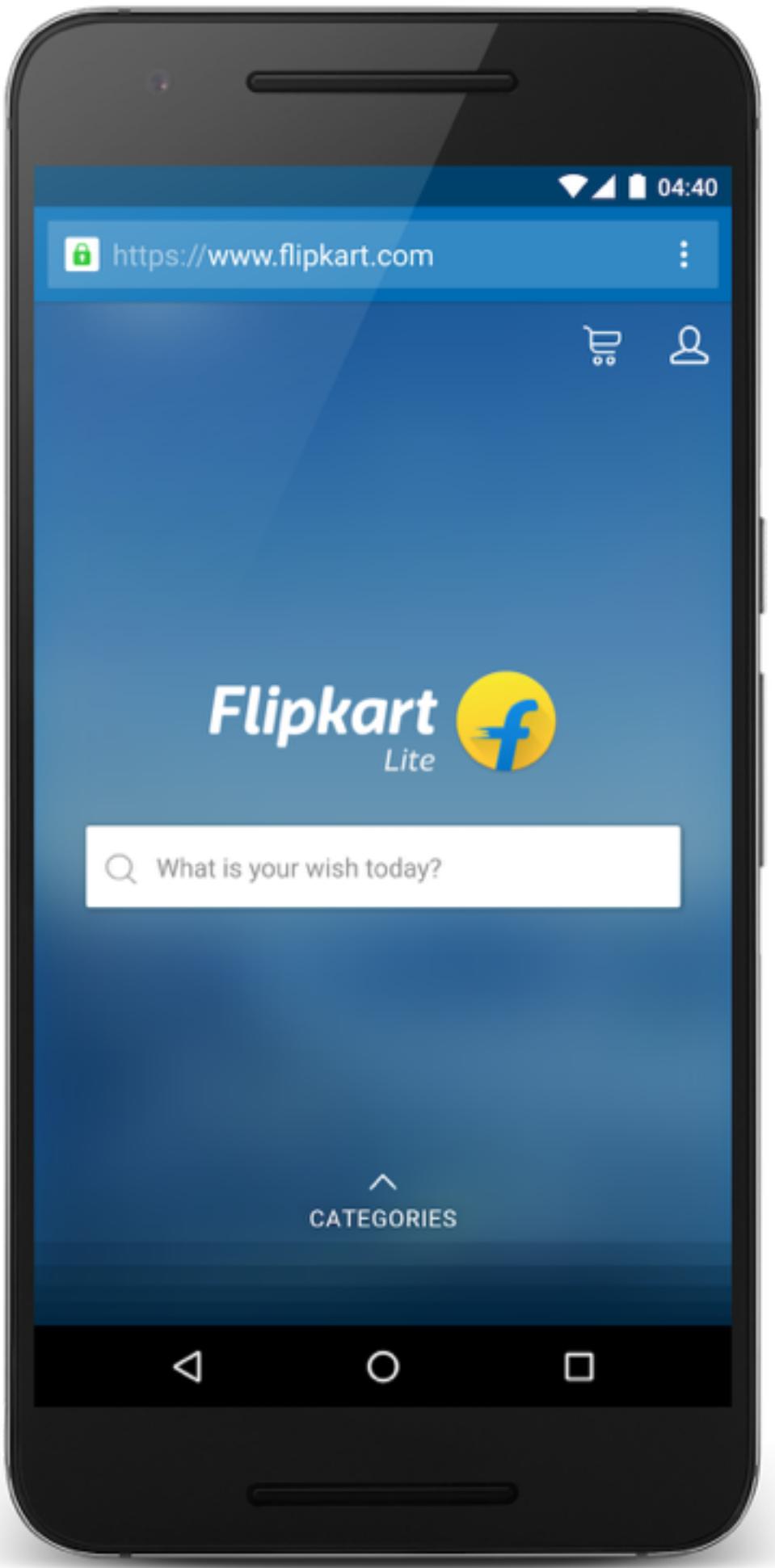
PWA DEMOS



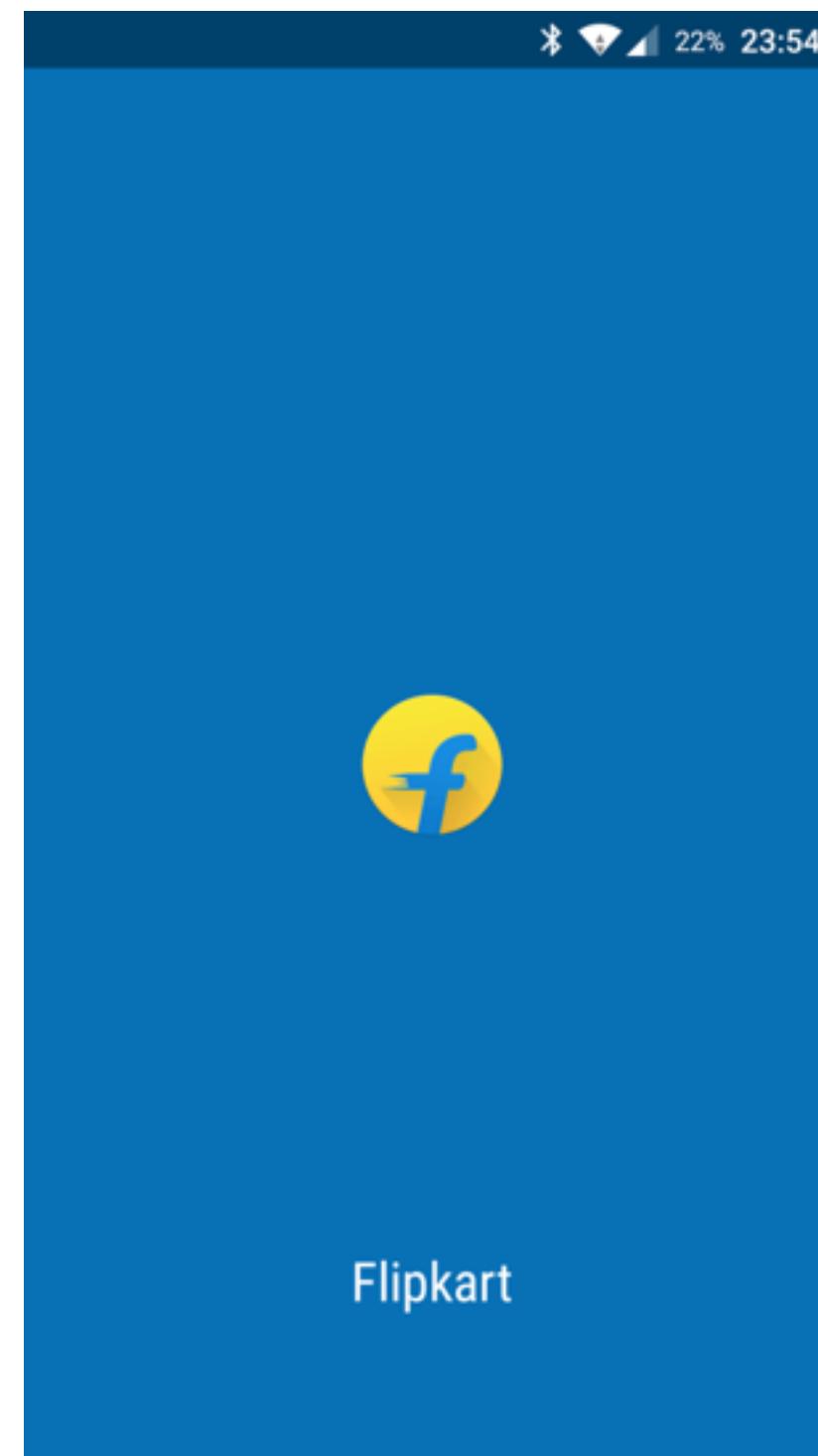
MORE EXAMPLES



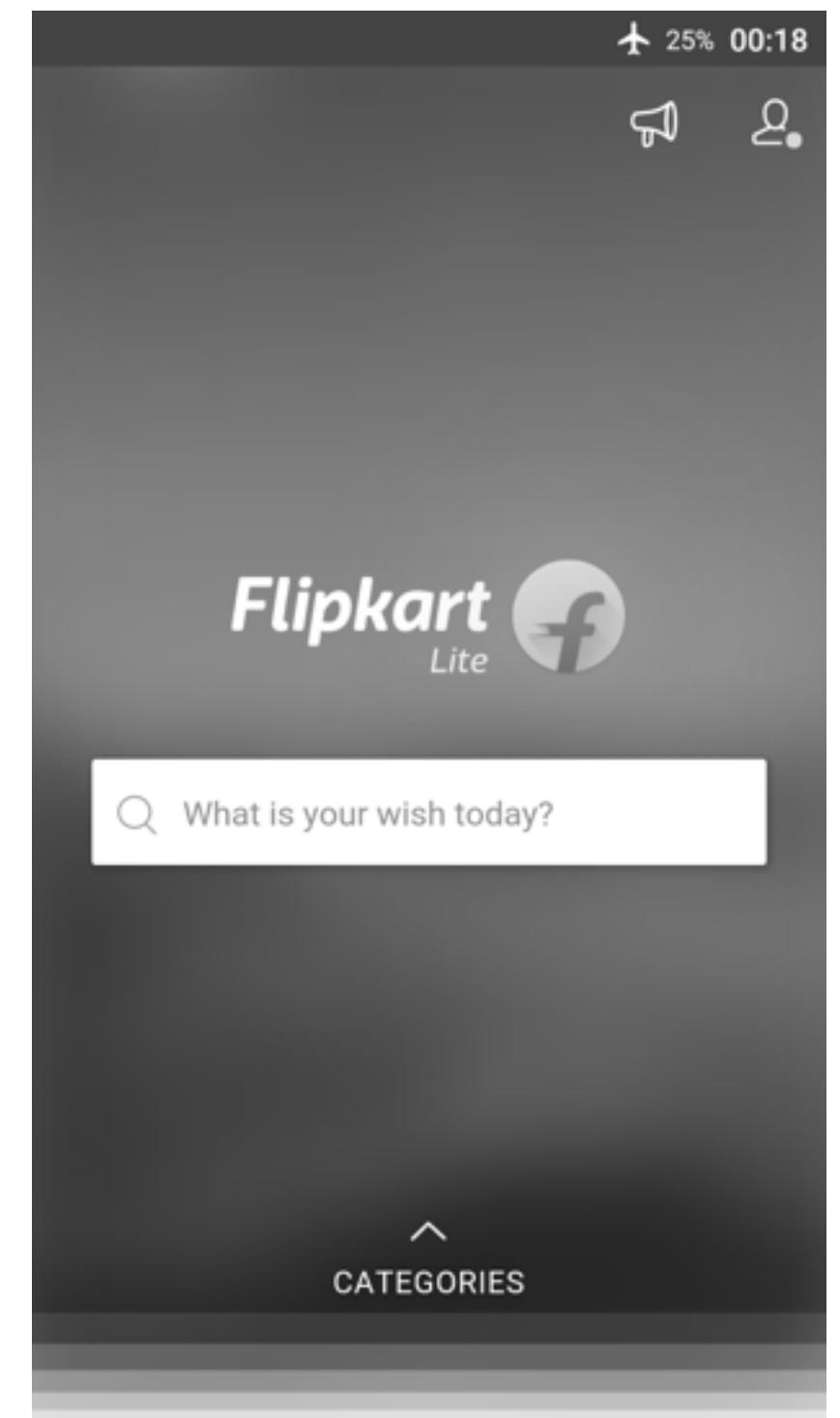
EXAMPLE: FLIPKART LITE



notifications



splash



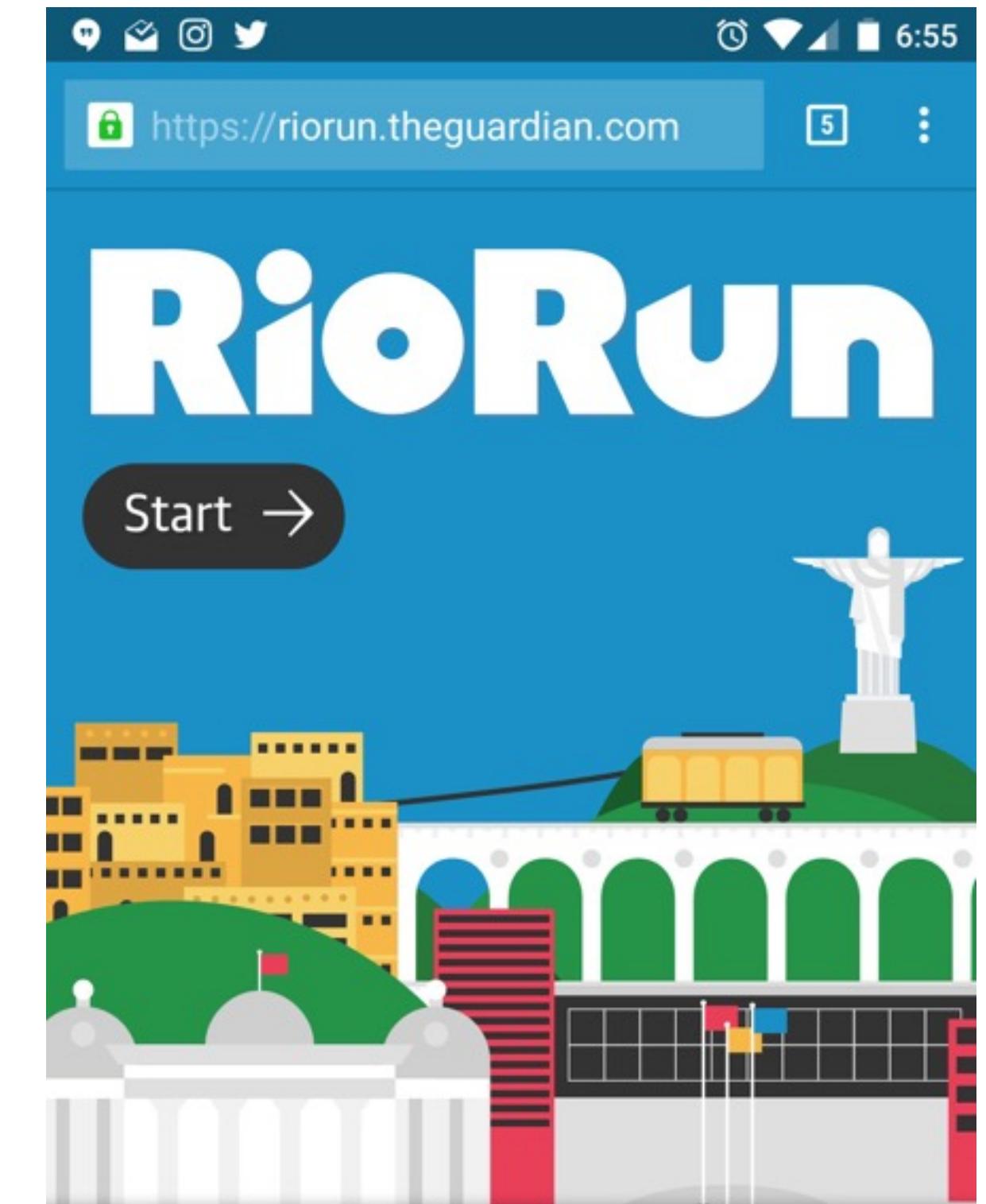
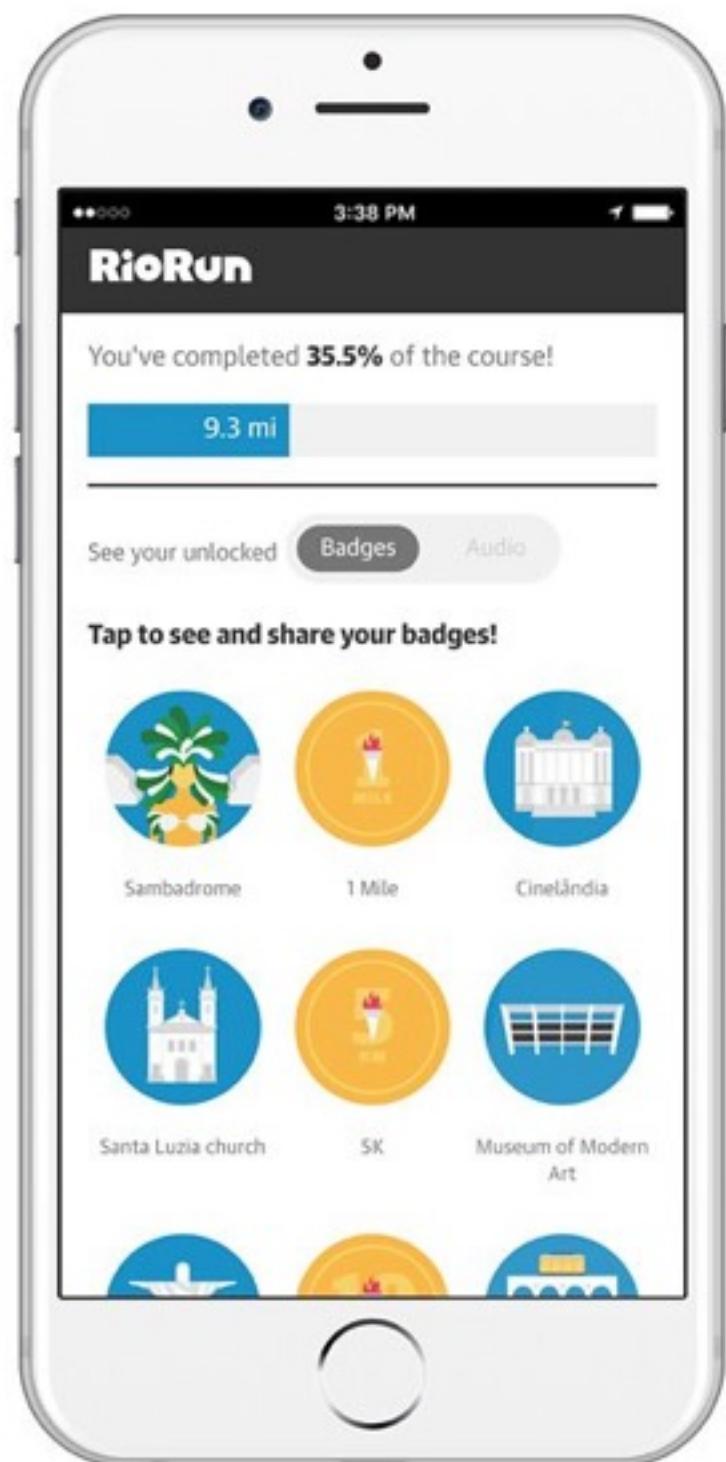
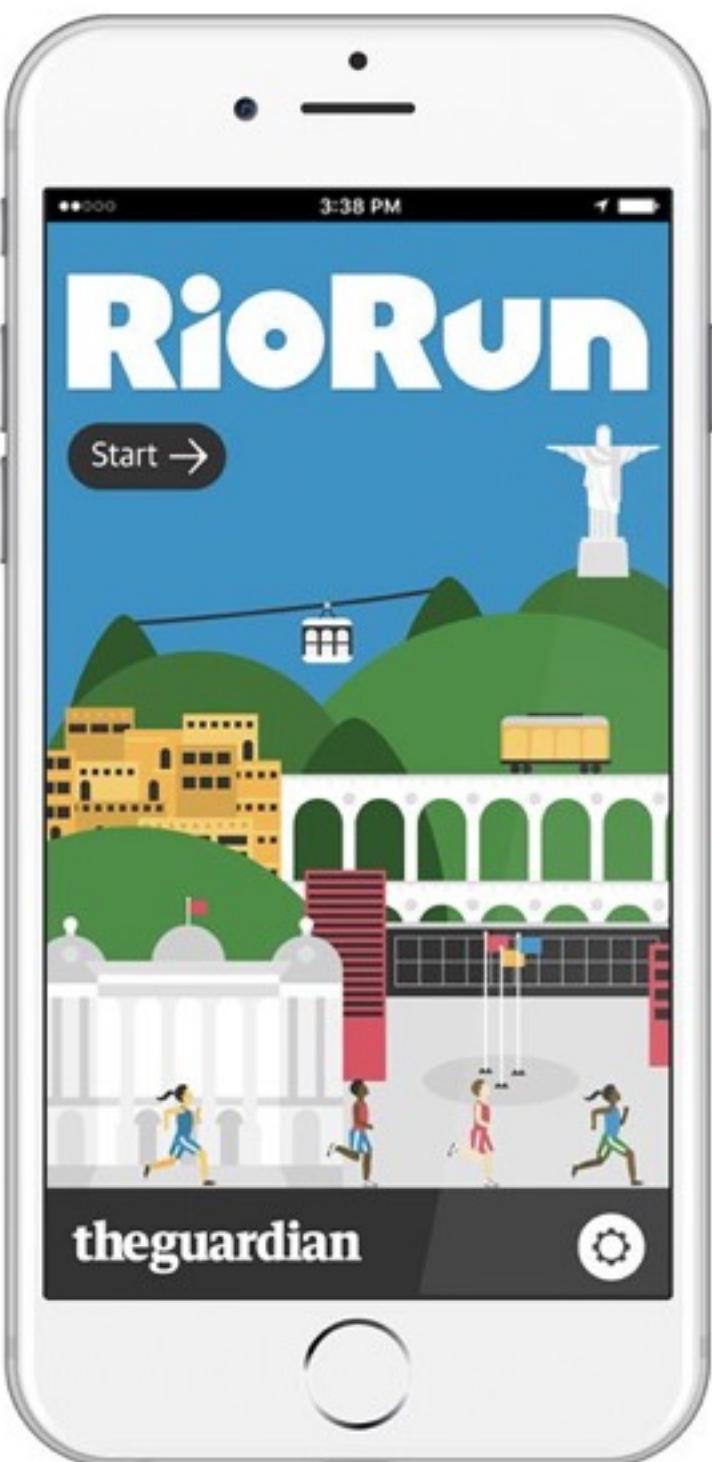
offline

EXAMPLE: AIR BERLIN

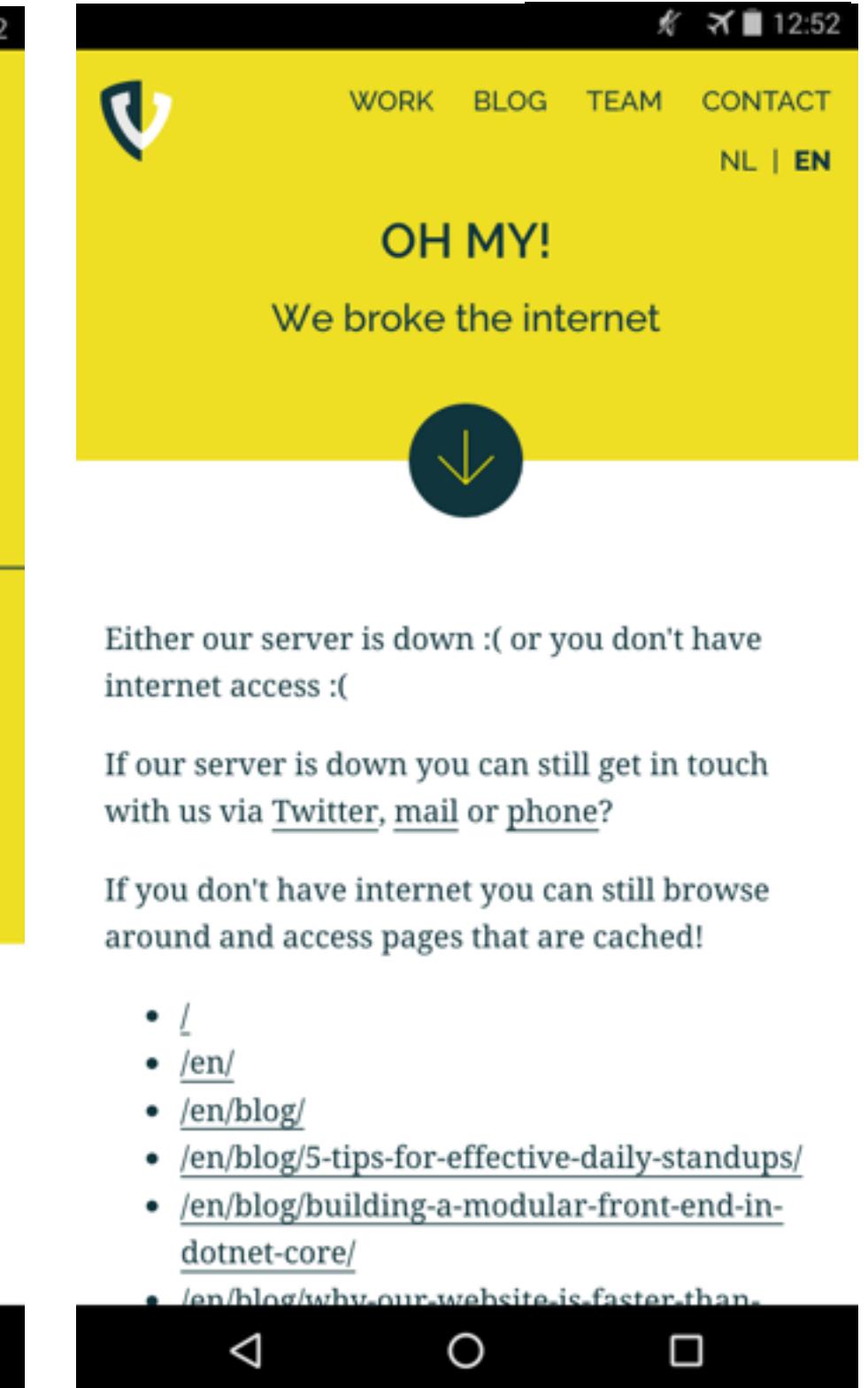
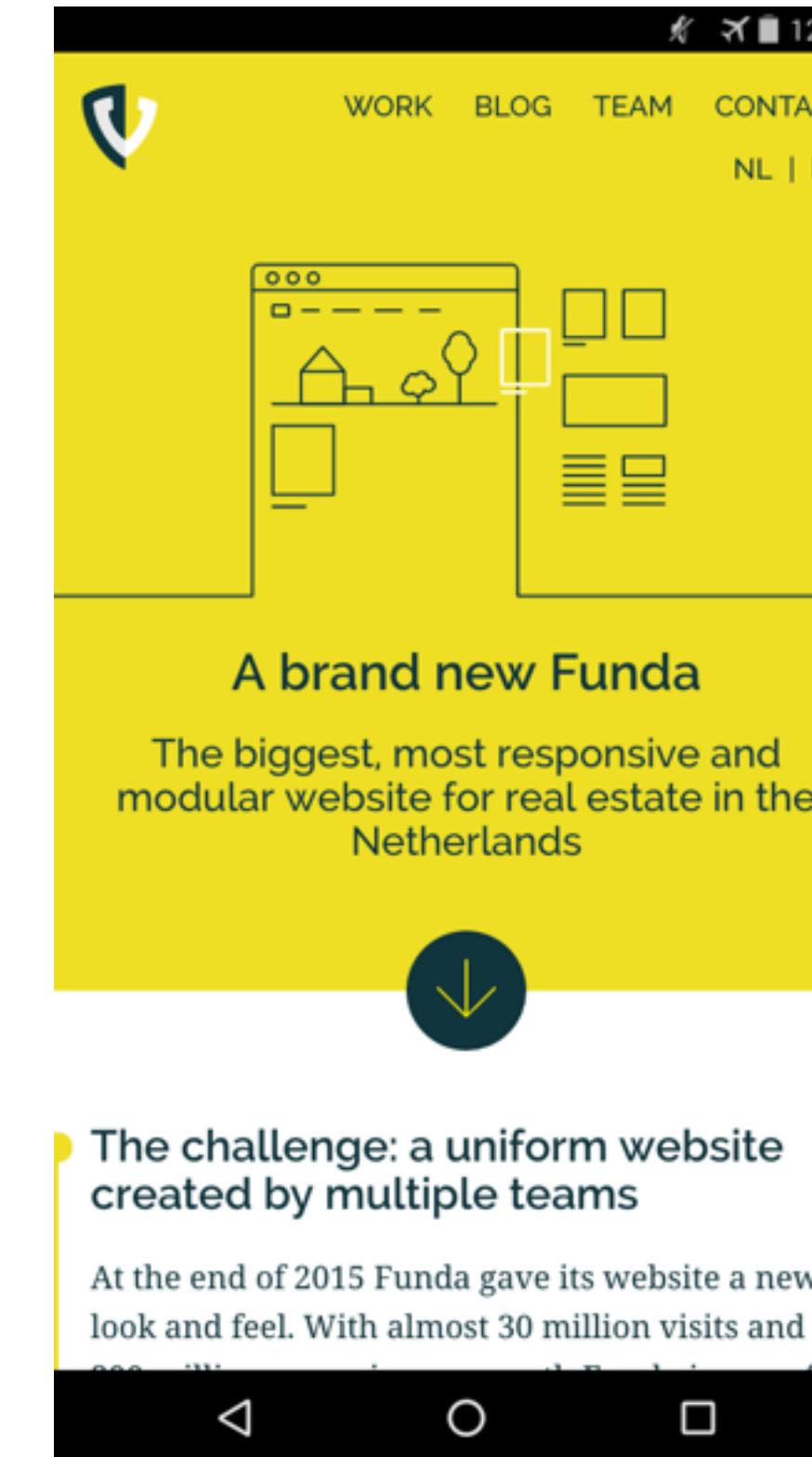
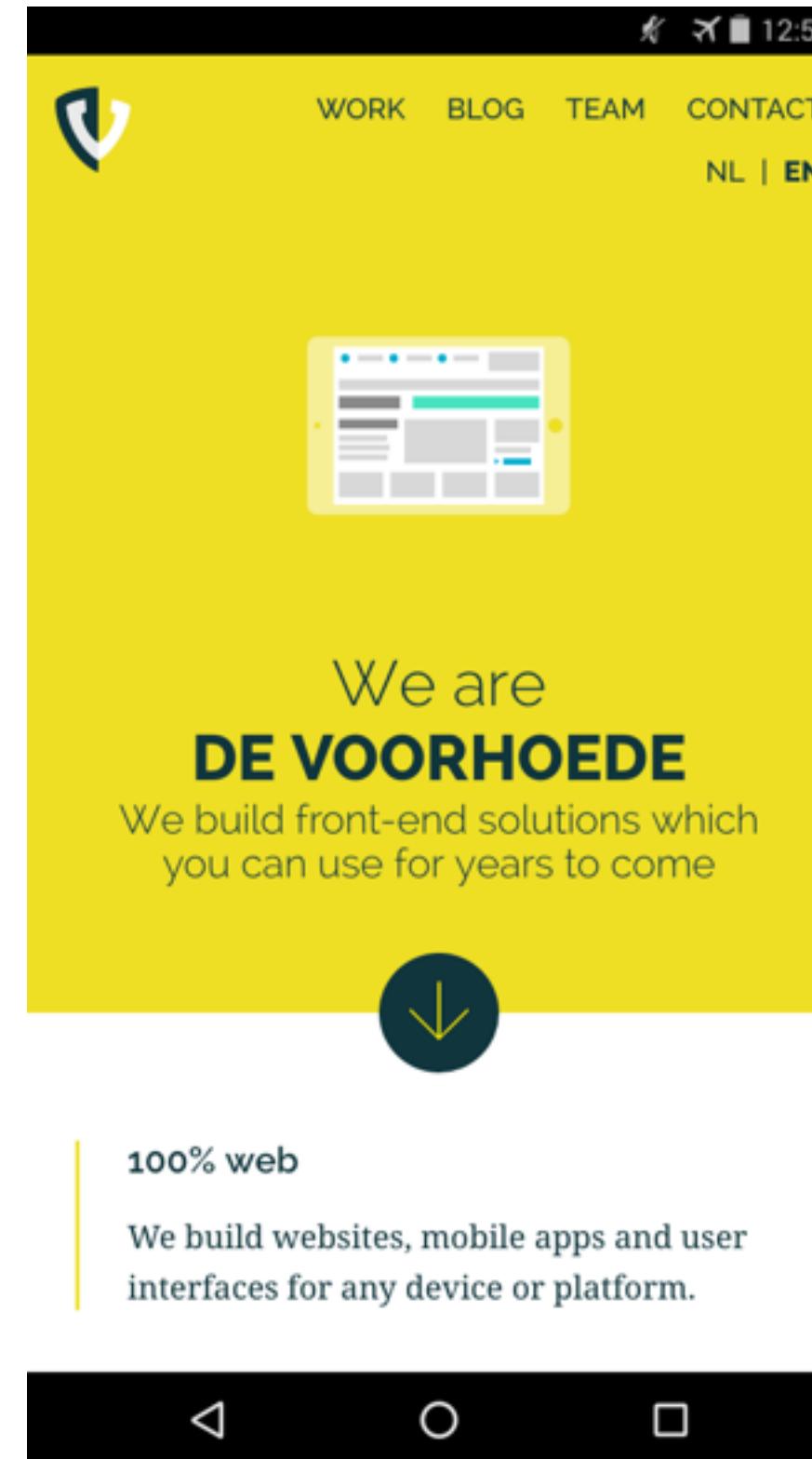
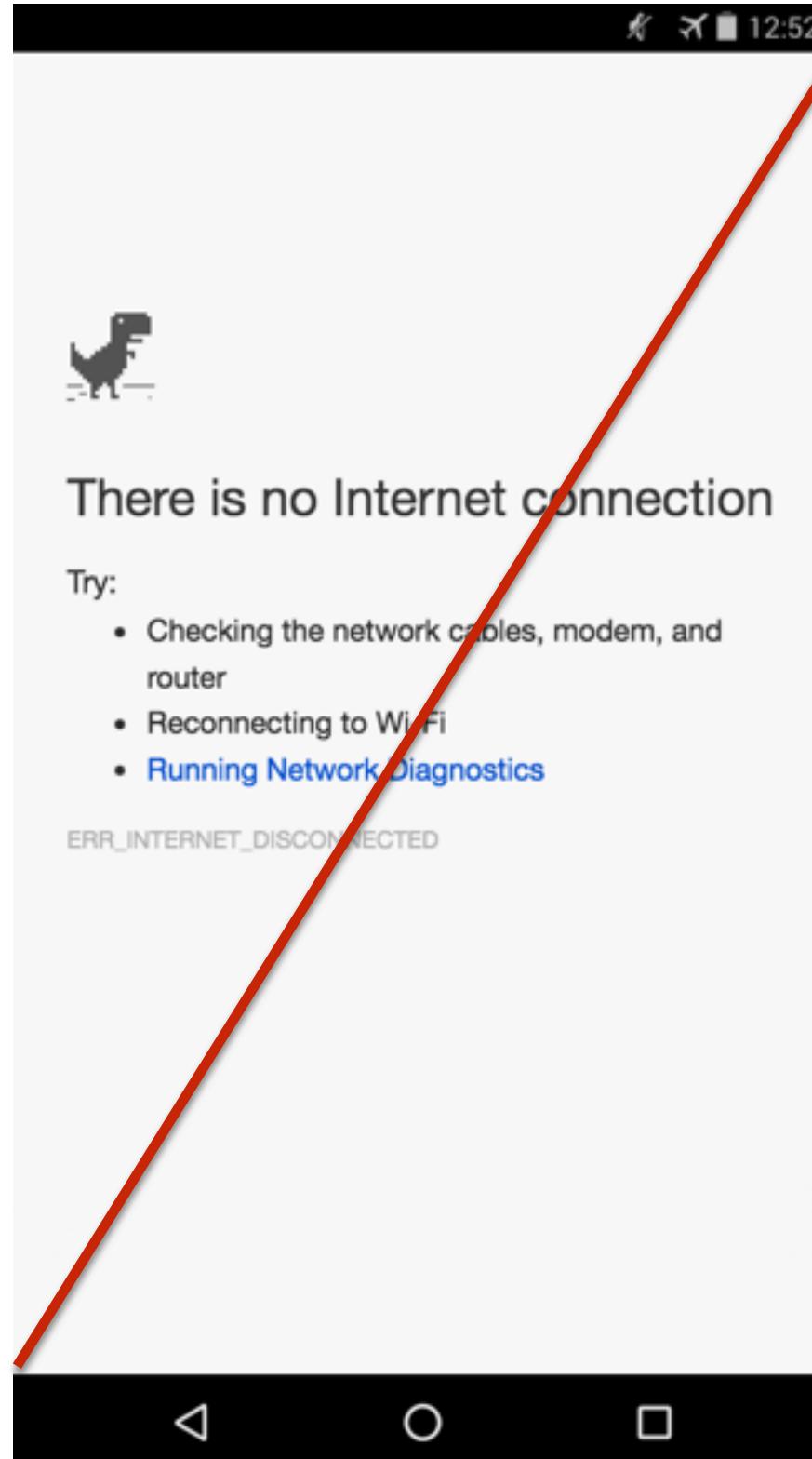


flights.airberlin.com/en-DE/progressive-web-app

EXAMPLE: RIO RUN



EXAMPLE: VOORHOEDE.NL



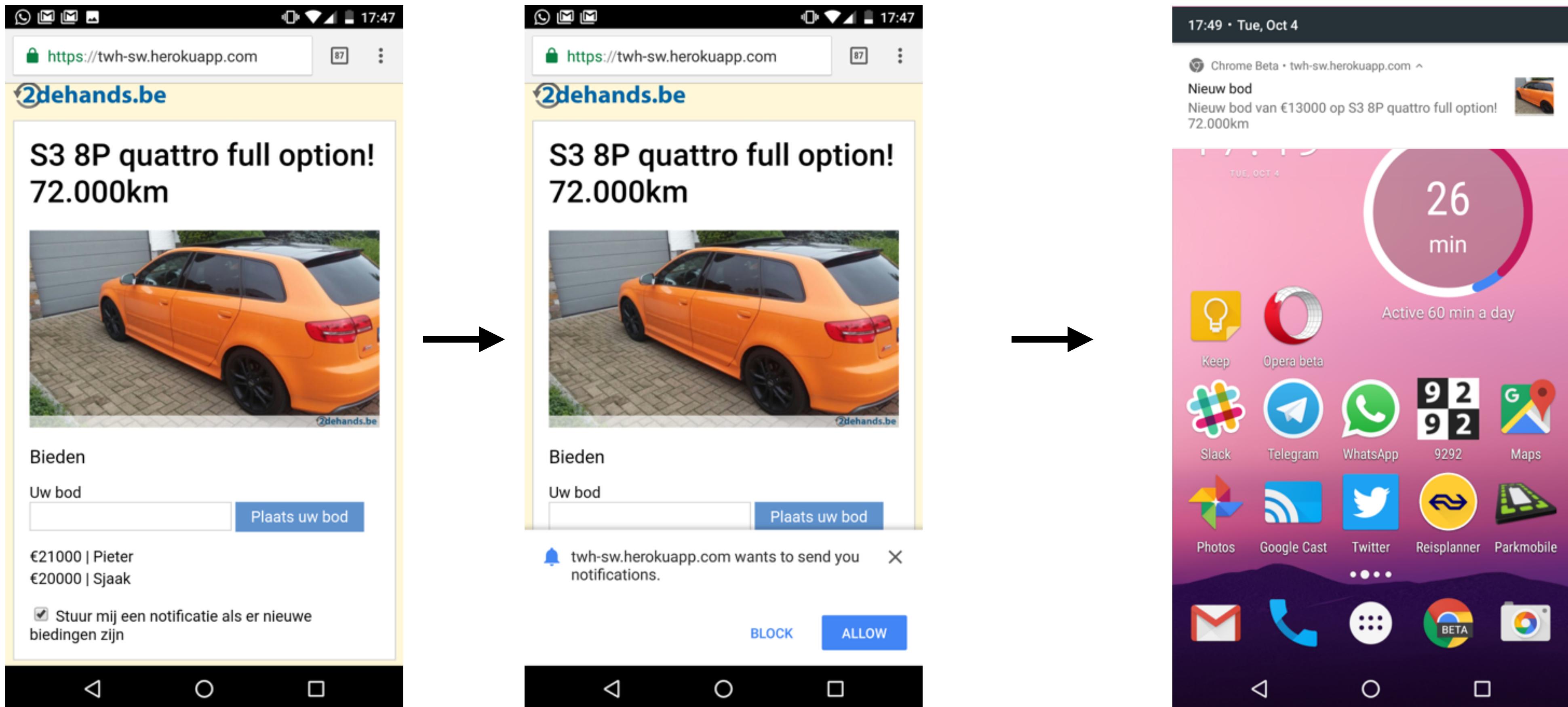
Either our server is down :(or you don't have internet access :(

If our server is down you can still get in touch with us via [Twitter](#), [mail](#) or [phone](#)?

If you don't have internet you can still browse around and access pages that are cached!

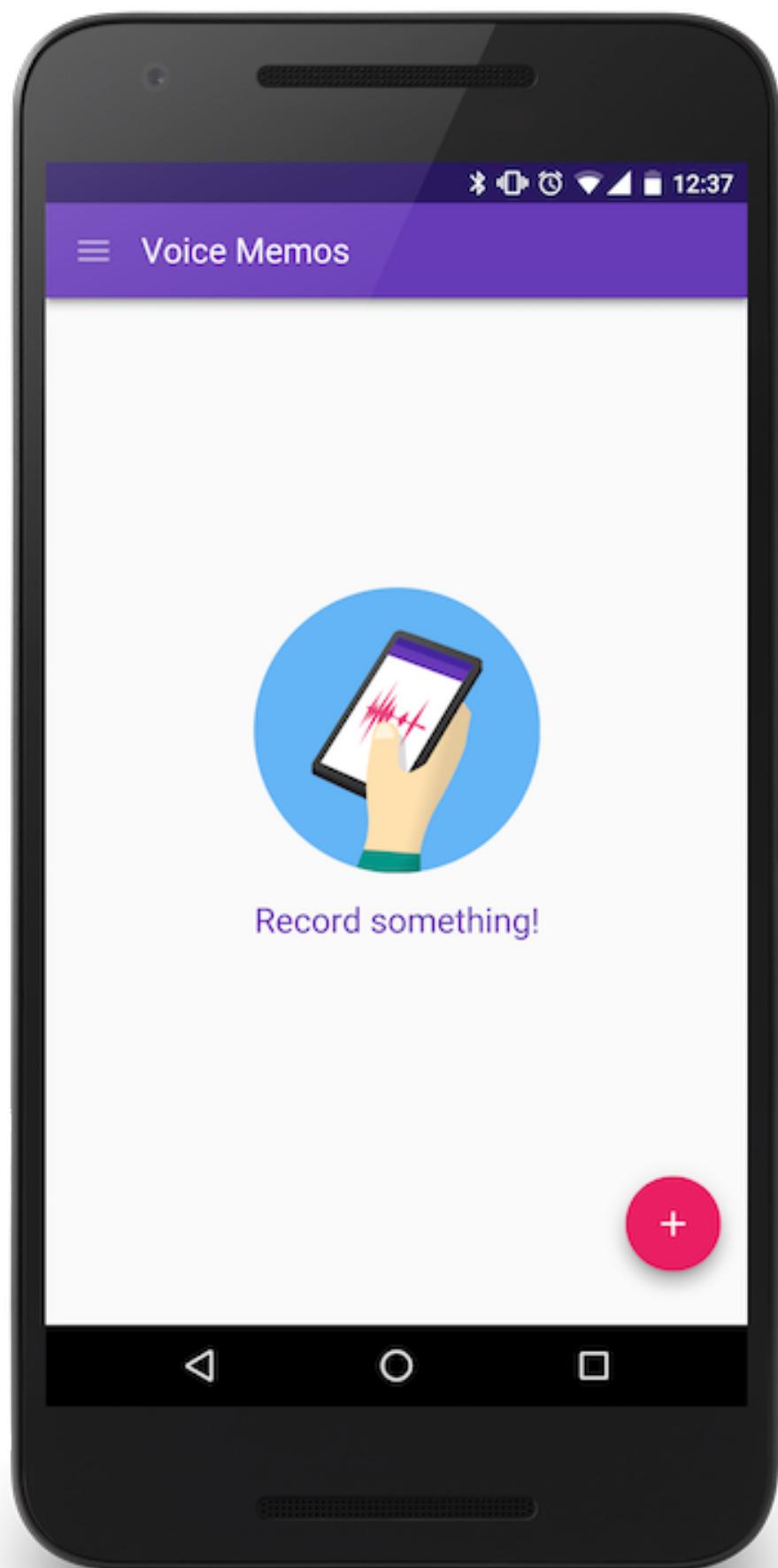
- [/](#)
- [/en/](#)
- [/en/blog/](#)
- [/en/blog/5-tips-for-effective-daily-standups/](#)
- [/en/blog/building-a-modular-front-end-in-dotnet-core/](#)
- [/en/blog/why-our-website-is-faster-than-](#)

EXAMPLE: 2DEHANDS.BE POC

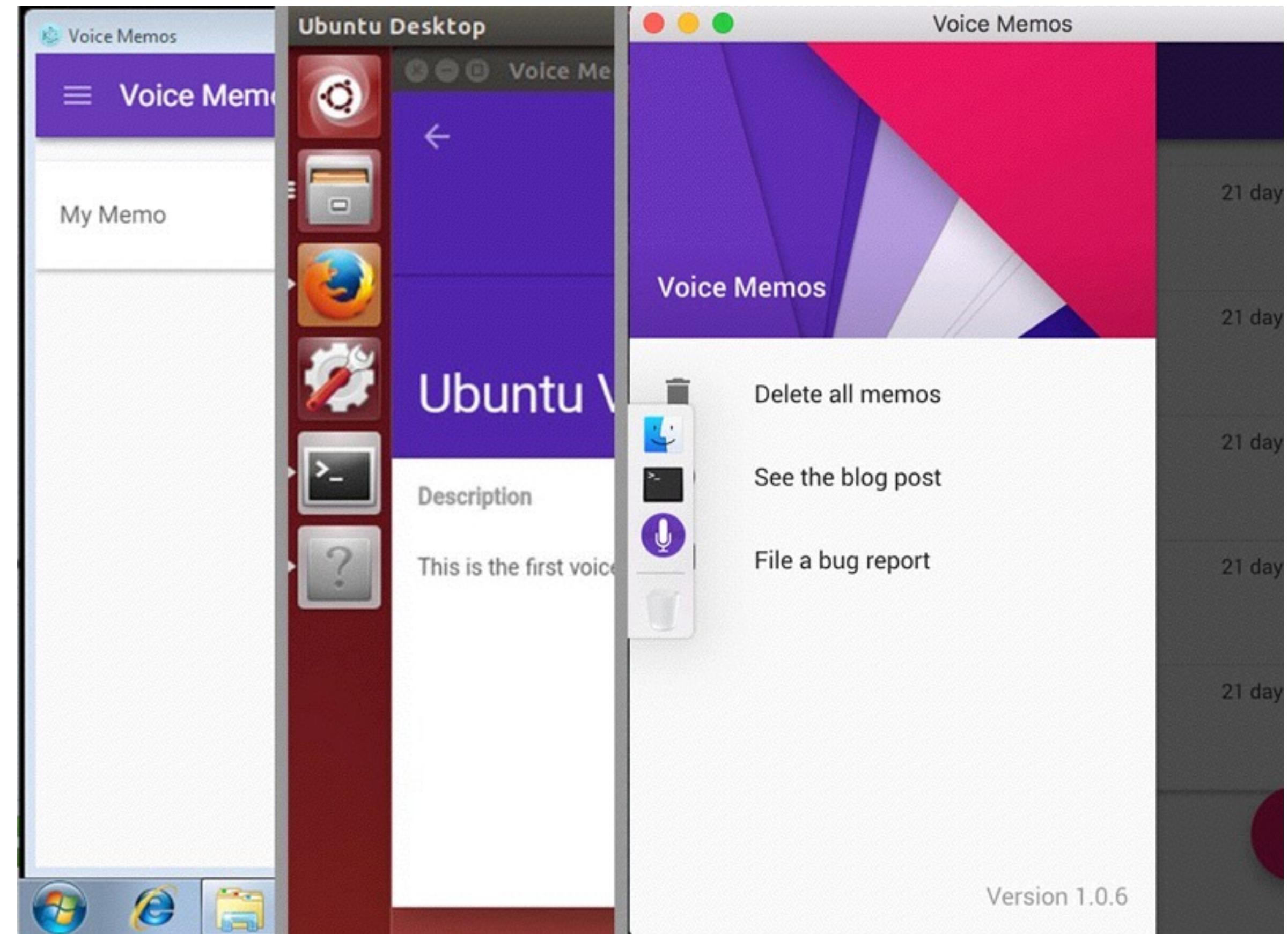


twh-sw.herokuapp.com

DESKTOP: PWA + ELECTRON?



pwaify
→

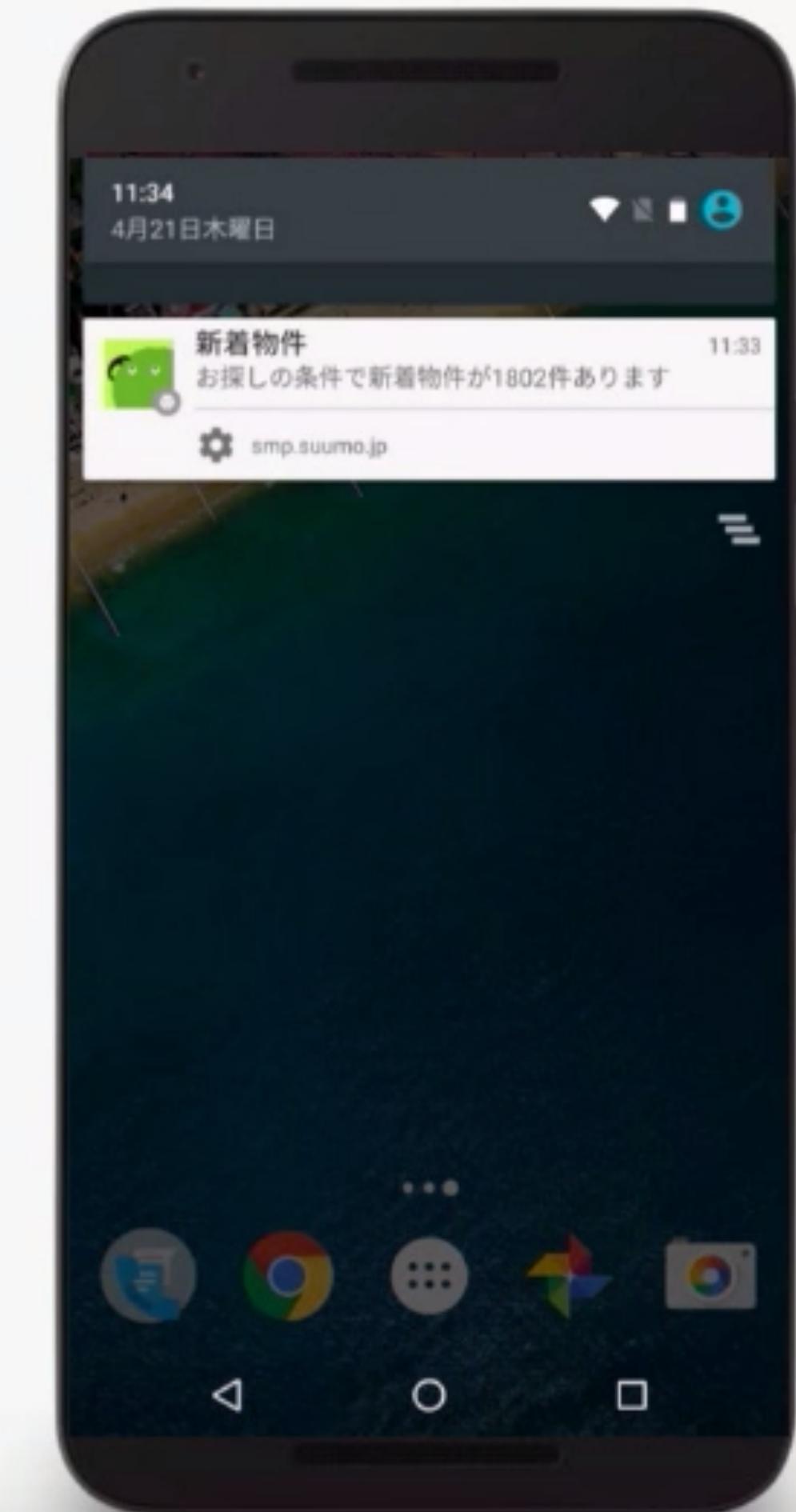


RE-ENGAGEMENT ↑

Suumo delivering
faster speed and
better re-engagement

75% decrease
in loading times on landing pages

31% open rate
from Web Push Notifications



youtube.com/watch?v=oSSl8liELJU&t=32m41s

RETENTION ↑

selioapp.com

AVERAGE SESSION

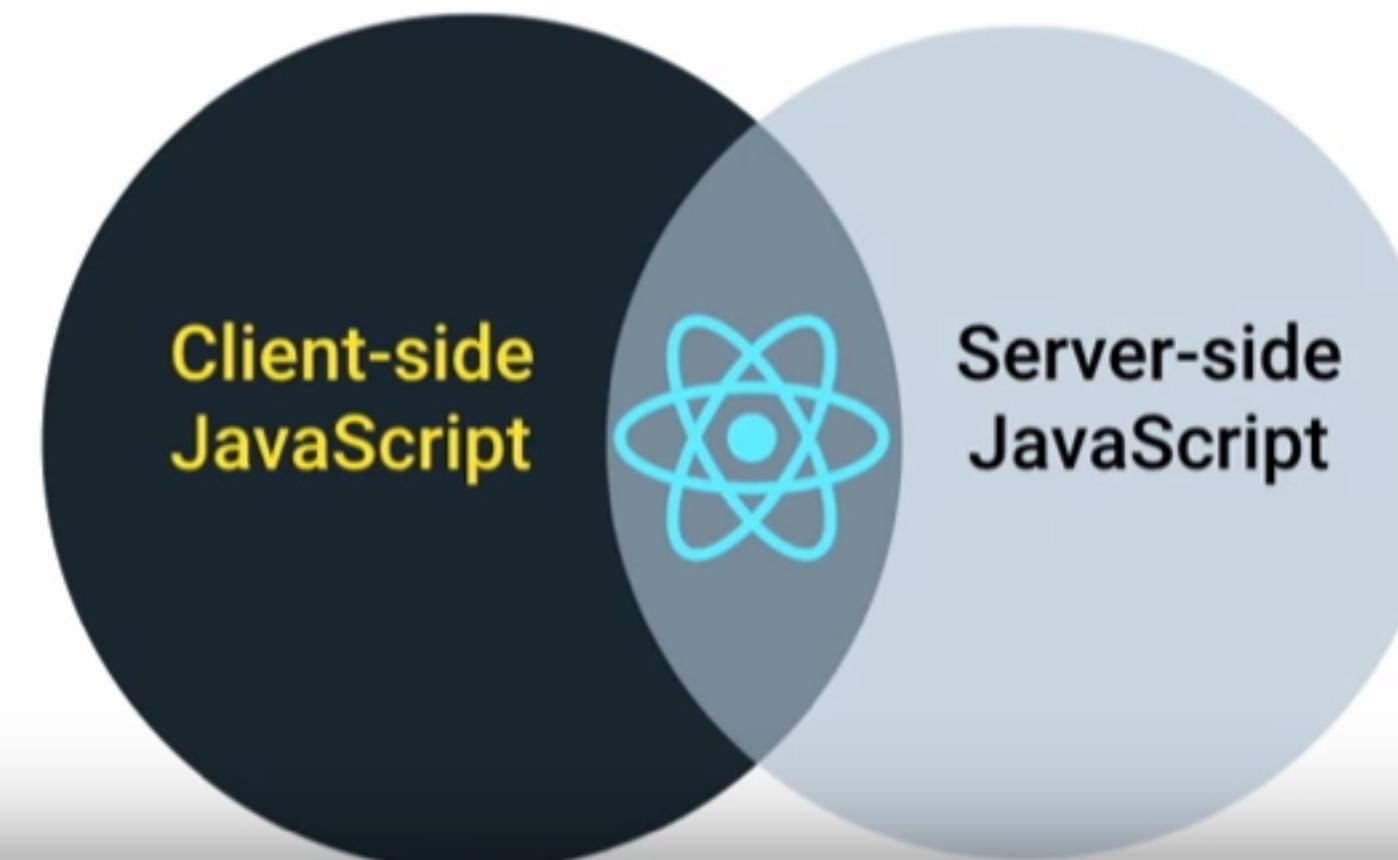
6+

minutes

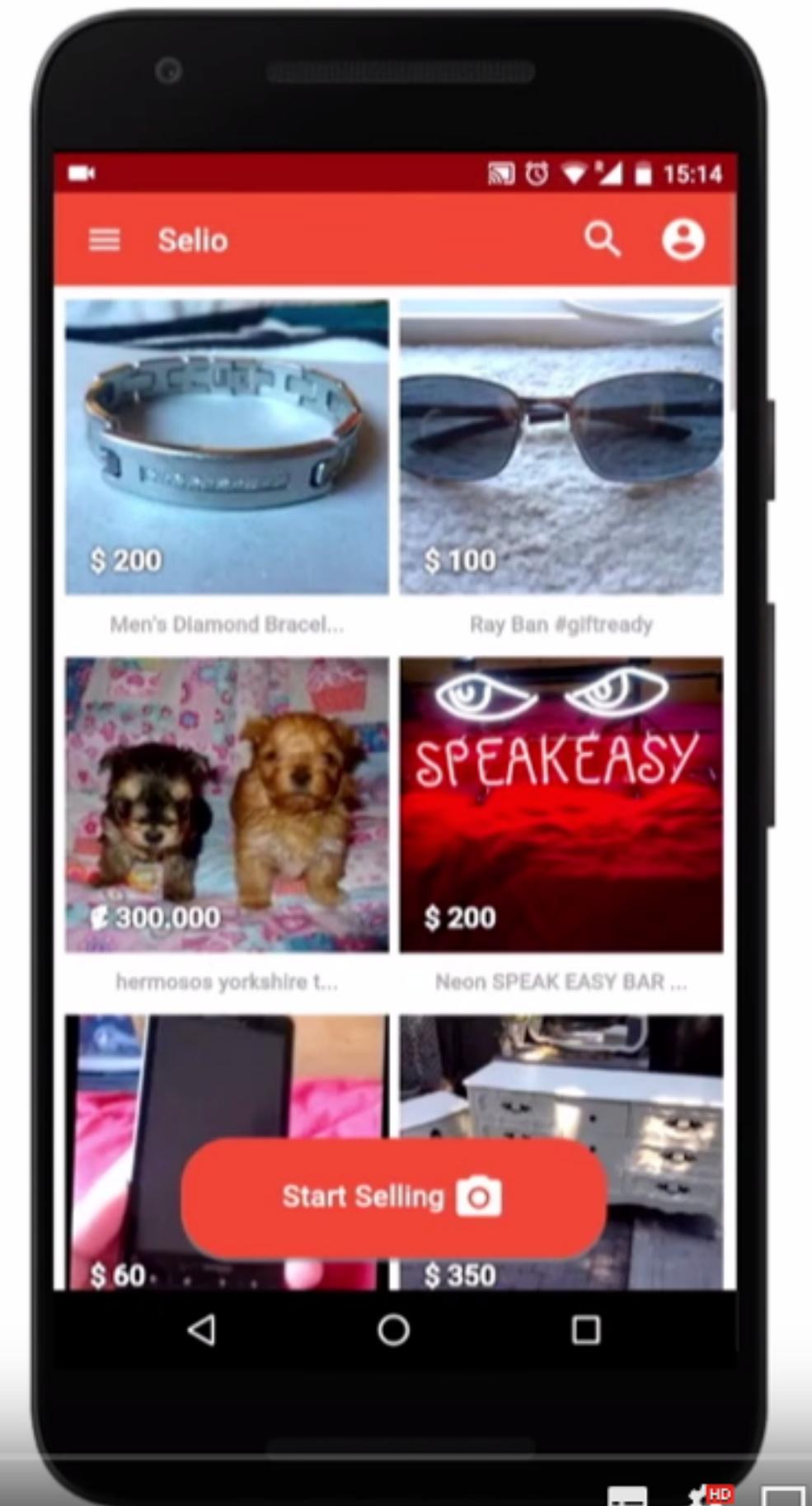
USER ACQUISITION

10X

cheaper than native



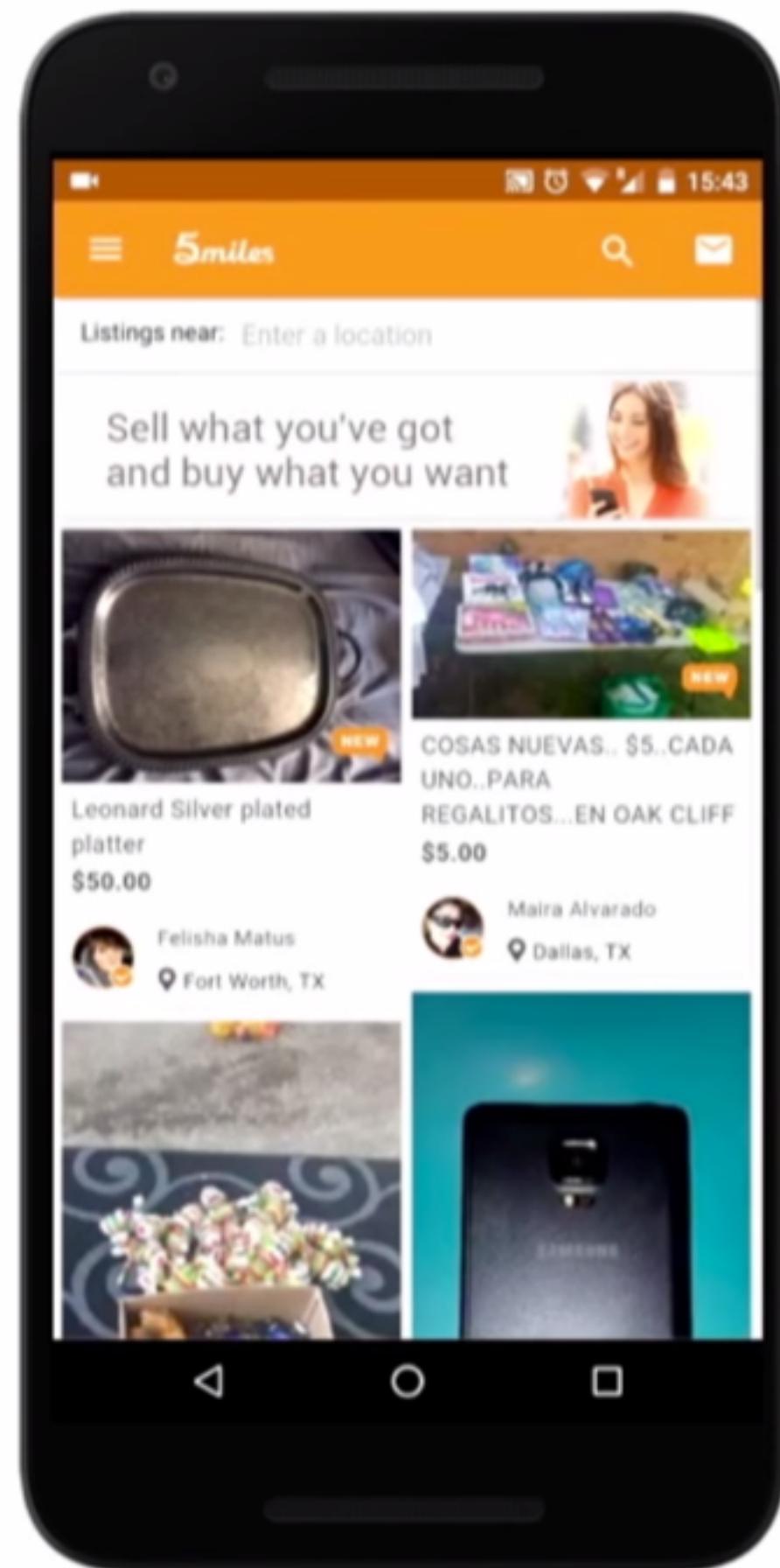
3:46 / 43:08



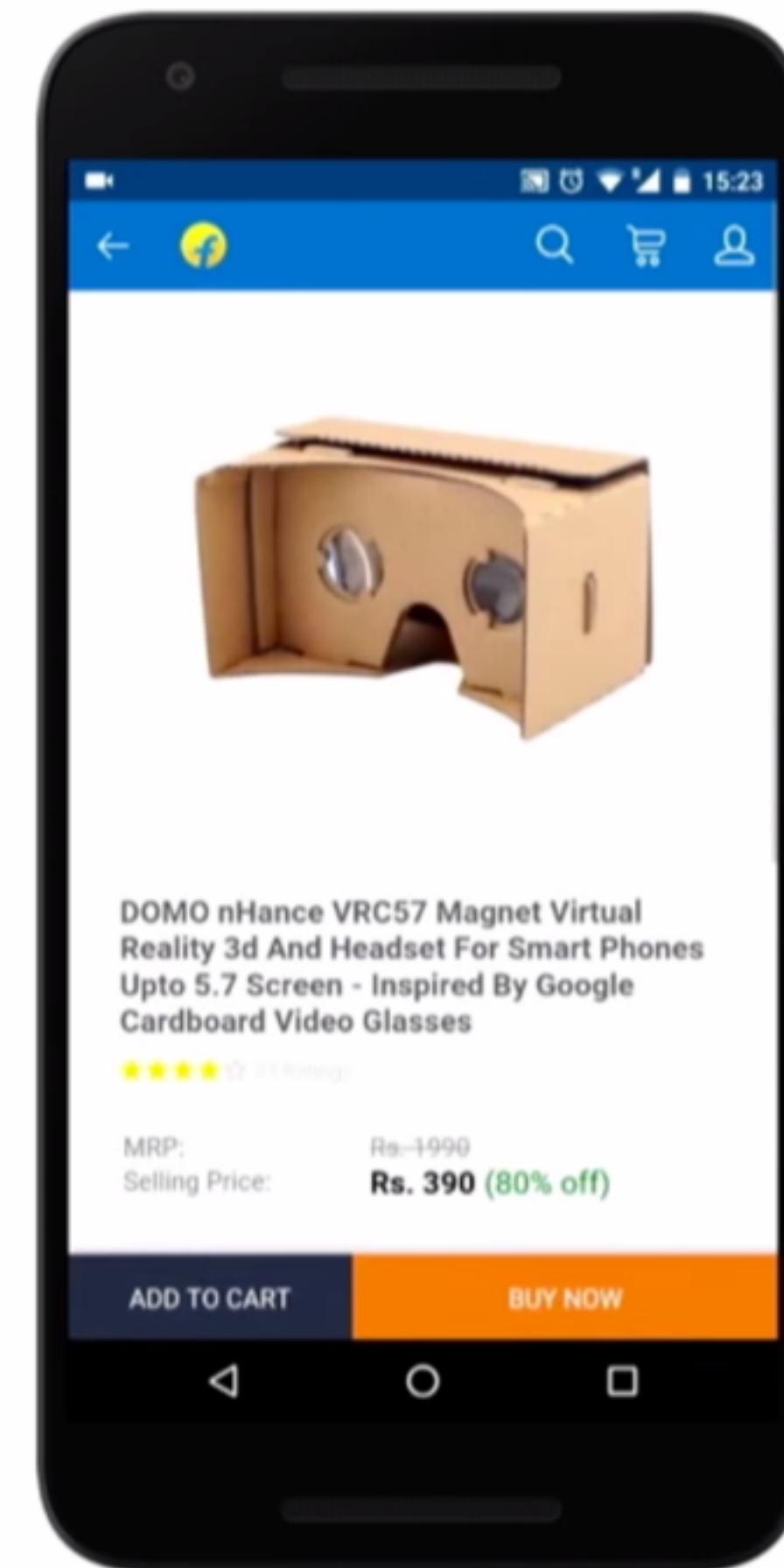
www.youtube.com/watch?v=srdKqoDckXQ&t=3m40s

CONVERSION ↑

A2HS USERS HAD
30%
BETTER CONVERSIONS

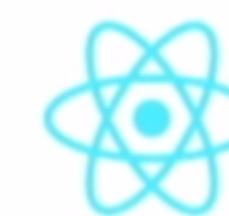


5miles



FlipKart

A2HS USERS HAD
70%
BETTER CONVERSIONS



React



youtube.com/watch?v=srdKqoDckXQ&t=3m

in short:
“Let’s start selling,
designing & building
1st class web apps”



@jbmoelker



DE VOORHOEDE

front-end developers