AGENDA

→ **Mobile native apps**
  - ◆ Pros
  - ◆ Cons
→ **Web apps**
  - ◆ Pros
  - ◆ Cons
→ **PWA: the best of both world?**

NATIVE APPS

NATIVE APPS

→ Pros
  ◆ Complete hardware access
    ● Even 3rd party hardware (NFC, Barcode scanners, etc…)
  ◆ Working offline (completely)
    ● Large (?) datasets
  ◆ App on stores (it's really a wanted feature?)
  ◆ They look(ed) cool (in 2010)
    ● The web was weak

NATIVE APPS

→ Cons
  ◆ Fat apps
  ◆ Regulars update are a nightmare
    ● I have ~ 10 updates/day (150-200MB!!)
  ◆ IMO performances are worse than the web apps counterpart
  ◆ They don't look so cool anymore (it's 2019)
  ◆ Very bad for 1-time use
   ● Transportation apps, museum apps, etc...

NATIVE APPS

→ Store problems
- ◆ High fees (15-30%)
- ◆ High rejection rates (mostly Apple)
  - ● 4.2.6: Apps created from a commercialized template or app generation service will be rejected https://love2dev.com/blog/apple-encouraging-progressive-web-apps-by-rejecting-apps/
- ◆ Problems with enterprise apps (mostly Apple)

NATIVE APPS

→ An adult installs an average of 0 apps/month (2015 survey)

→ Native apps lose ~15% at every step:
   - ◆ Load Store
   - ◆ Find in Store
   - ◆ Click Install
   - ◆ Accept permissions
   - ◆ Download
   - ◆ Using the app

Your Business

Your Offer Here

Start With 1000 Potential App Downloads
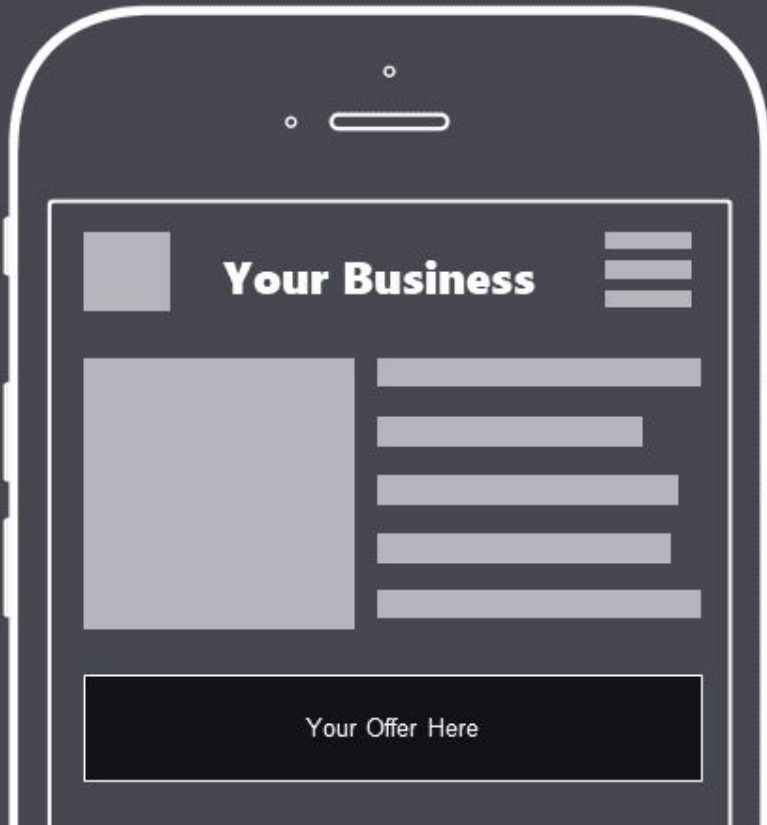
Load Store	**800**
Find In Store	**640**
Click Install	**512**
Accept Permissions	**410**
Download	**328**
Use App	**262**

NATIVE APPS

→ New mobile OSes?
- ◆ Huawei affair
- ◆ The problem starts even at 1% market share
  - ● If you have the problem it's a 100%
- ◆ Embarcadero or Microsoft are not going to invest because of low ROIs
  - ● Your only choice is to embrace a new platform development toolchain

NATIVE APPS

→ Negative use cases
  ◆ Updates on "public" apps
  ◆ Updates on "private" apps

→

WEB APPS

WEB APPS

→ Pros
- ◆ For all users: no download, install...
- ◆ They work on every device! (every OS)
  - • And on every device kind (phones, tablets...)
- ◆ Easy updates
- ◆ Some hardware access (location, camera)
- ◆ Expanding support from Google, Apple, etc...
- ◆ Eventually they can be packed into a native app (Cordova, PhoneGap)

WEB APPS

→ Cons
  - ◆ JavaScript Skills
  - ◆ Limited hardware support
  - ◆ No (heavy) offline use ***

APP.DELPHIDAY.IT
PWA APP

https://app.delphiday.it

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PIACENZA
EDITION

2019 - XVIII Edizione

wintech
italia

PWA

PWA

➔ **PWA main features**
- ◆ Web App Manifest (home icon, etc...)
- ◆ Uses HTTPS - Secure by Default
- ◆ Push notification
- ◆ Works Offline/Reliable
- ◆ Fast By Design
- ◆ Integrated With Platform
- ◆ Not only mobile OSes
  - ● Windows, Linux (mostly through Chrome)

PWA FEATURES

→ Progressive
- ◆ Work for every user, regardless of browser choice

→ Responsive
- ◆ Fit any form factor: desktop, mobile, tablet, etc...

→ Connectivity independent
- ◆ Enhanced with service workers to work offline or on low-quality networks

PWA FEATURES

➔ App-like
  ◆ Feel like an app to the user with app-style interactions and navigation
➔ Fresh
  ◆ Always up-to-date (service worker update process)
➔ Safe
  ◆ Served via HTTPS to prevent tampering

PWA FEATURES

→ Discoverable
- ◆ Identifiable as "applications" thanks to W3C manifests and service worker registration scope allowing search engines to find them.

→ e-engageable
- ◆ make re-engagement easy through features like push notifications

PWA FEATURES

➔ Installable
  ◆ users keep apps they find most useful on their home screen without the NEED of an app store
➔ Linkable
  ◆ easily share via a URL

PWA²

→ **PWA² advanced features**
  - ◆ Speech synthesis & recognition API
  - ◆ Media capture API
  - ◆ Vibration API
  - ◆ Network Info API
  - ◆ Orientation API
  - ◆ Battery API
  - ◆ Web Share API
  - ◆ Bluetooth API

PWA: THE FUTURE

→ **The future**
- ◆ **Web Audio API**
- ◆ **Payment Request API**
- ◆ **Memory API**
- ◆ **WebUSB API**
- ◆ **Searchable on the stores**

PWA: ARTICLES

→ 2018: Year of PWA
  ◆ https://christianliebel.com/2018/12/year-of-pwa-a-summary
→ What Web Can Do Today
  ◆ https://whatwebcando.today/
→ Progressive Web App Checklist
  ◆ https://developers.google.com/web/progressive-web-apps/checklist
→ PWAs and Windows 10
  ◆ https://developer.microsoft.com/en-us/windows/pwa
→ PWA on Google Play Store
  ◆ https://blog.karumi.com/publish-a-pwa-in-google-play-store

GITHUB

SOURCE CODE
github.com/lminuti

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2019 - XVIII Edizione

wintech italia

ADD TO HOMESCREEN

COMPATIBILITY

→ **A2HS is supported by Mobile**
- ◆ **Chrome/Android Webview since version 31**
- ◆ **Opera for Android since version 32**
- ◆ **Firefox for Android since version 58**
- ◆ **iOS? It's a long story…**
  - https://medium.com/@firt/whats-new-on-ios-12-2-for-progressive-web-apps-75c348f8e945

A2HS READY?

→ To be served over HTTPs
→ To have a manifest file with the correct fields filled in
→ To have an appropriate icon
→ Chrome additionally requires the app to have a service worker registered

MANIFEST

→ **A JSON-formatted file**

→ **The fields needed for A2HS are:**

◆ **short_name or name**

◆ **icons (192px e 512px)**

◆ **start_url**

◆ **display**

`theme_color`

`icon`

`background_color`

EMBIGGEN

`name`

https://developer.mozilla.org/en-US/docs/Web/Manifest
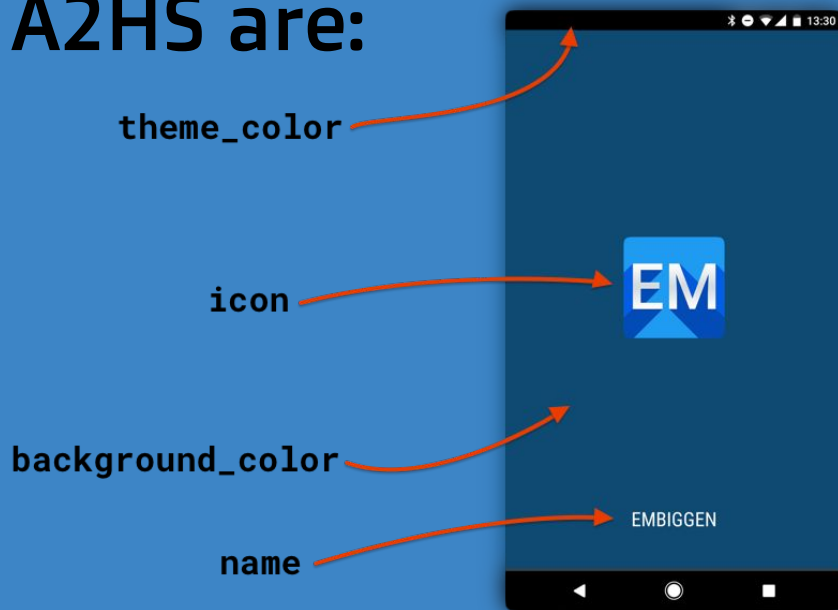
SERVICE WORKER

➔   A service worker is an event-driven worker registered against an origin and a path
➔   Act as proxy between app and the network
➔   Enable the creation of effective offline experiences
➔   It has no DOM access, and runs on a different thread
➔   They will also allow access to push notifications and background sync APIs

https://developer.mozilla.org/en-US/docs/Web/API/Service_Worker_API

BATTERY API

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
BatteryManager 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
charging 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
chargingTime 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
dischargingTime 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
level 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
onchargingchange 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
onchargingtimechange 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
ondischargingtimechang 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes
onlevelchange 👎	38	No	16 — 52 ▾	No	25	No	40	38 ★ ▾	No	10 — 16 -x- ▾	25	? — ?	Yes

Battery API

```javascript
navigator.getBattery().then(function(battery) {

  battery.addEventListener('chargingchange', function(){
    console.log("Battery charging? " +
        (battery.charging ? "Yes" : "No"));
  });

  battery.addEventListener('levelchange', function(){
    console.log("Battery level: "
        + battery.level * 100 + "%");
  });
});
```

https://developer.mozilla.org/en-US/docs/Web/API/Battery_Status_API

NETWORK INFO API

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
NetworkInformation 🧪	61	No	No	No	48	No	50	38	?	31	45	No	?
Available in workers 🧪	61	No	No	No	48	No	50	38	?	53	45	No	?
downlink 🧪	61	No	No	No	48	No	50	38	?	?	45	No	?
downlinkMax 🧪	61 ★	No	No	No	No	No	50	38	?	No	37	No	?
effectiveType 🧪	61	No	No	No	48	No	50	38	?	Yes	45	No	?
onchange 🧪	61	No	No	No	48	No	50	38	?	No ★	45	No	?
ontypechange 🧪	No	No	No	No	?	No	No	No	?	?	?	No	?
rtt 🧪	61	No	No	No	48	No	50	38	?	No	45	No	?
saveData 🧪	65	No	No	No	Yes	No	65	65	?	?	Yes	No	?
type 🧪	61 ★	No	No	No	No	No	50	38	?	No	37	No	?

Network information API

```
var connection = navigator.connection || navigator.mozConnection ||
navigator.webkitConnection;
var type = connection.effectiveType;

function updateConnectionStatus() {
  console.log("Connection type changed from " + type + " to " +
    connection.effectiveType);
}

connection.addEventListener('change', updateConnectionStatus);
```

https://developer.mozilla.org/en-US/docs/Web/API/Network_Information_API

ORIENTATION

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
DeviceOrientationEvent 🧪	7 ★	Yes	6 ★	?	Yes	?	Yes ★	Yes ★	Yes	6 ★	No	4.2	Yes
DeviceOrientationEvent constructor 🧪 ⚠	59	?	?	?	?	?	59	59	?	?	No	?	?
absolute 🧪	7	12	6	?	Yes	?	Yes	Yes	Yes	6	No	4.2	Yes
alpha 🧪	7	12	6	?	Yes	?	Yes	Yes	Yes	6	No	4.2	Yes
beta 🧪	7	12	6	?	Yes	?	Yes	Yes	Yes	6	No	4.2	Yes
gamma 🧪	7	12	6	?	Yes	?	Yes	Yes	Yes	6	No	4.2	Yes

Device Orientation Event

```javascript
function handleOrientation(event) {
  var alpha     = event.alpha;
  var beta      = event.beta;
  var gamma     = event.gamma;

  // Do stuff with the new orientation data
}


window.addEventListener('deviceorientation', handleOrientation);
```

https://developer.mozilla.org/en-US/docs/Web/API/Detecting_device_orientation

MEDIA DEVICES

COMPATIBILITY

	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
MediaDevices	47	Yes	33	No	30	11	47	47	Yes	36	30	11	Yes
ondevicechange	57	12	52 ▾	No	34	No	No	No	?	Yes	34	No	?
devicechange event	57	12	52	No	34	No	No	No	?	?	43	No	?
enumerateDevices	47	12	63 ★ ▾	No	34	11	47	47	Yes	39	34	11	Yes
getSupportedConstraint	53	12	44	No	40	11	53	52	?	50	41	11	Yes
getDisplayMedia()	72 ▾	17 ★ ▾	66	No	?	No	No ★ ▾	No	Yes	No ★ ▾	Yes	No	?
getUserMedia	52 ▾	12	36 ★ ▾	No	40	11	53	52 ▾	Yes	36 ★ ▾	41	11	Yes
Stereo audio capture	?	?	55	No	?	No	?	?	?	No	?	No	?

Media devices interface

```javascript
var video = document.querySelector('video');
var constraints = window.constraints = {
  audio: false,
  video: true
};


navigator.mediaDevices.getUserMedia(constraints)
    .then(function(stream) {
      video.srcObject = stream;
    })
    .catch(function(error) {
        console.log(error);
    });
```

https://developer.mozilla.org/en-US/docs/Web/API/MediaDevices

SHARE API

COMPATIBILITY

		Desktop						Mobile						
		Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
share		No	?	No	No	No	12.1	No	61	?	No	48	12.2	?

Share API

```
navigator.share({
  title: document.title,
  text: 'Hello World',
  url: 'https://developer.mozilla.org',
}); // share the URL of MDN
```

https://developer.mozilla.org/en-US/docs/Web/API/Navigator/share

SPEECH SYNTHESIS

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
speechSynthesis	33	14	49	No	Yes	7	?	Yes	Yes	No	No	7.1	Yes

Speech Synthesis

```javascript
// Get the voices
var synth = window.speechSynthesis;
var voices = synth.getVoices() || [];
voices.forEach(function(voice) {
    //
});

// Speak

var utterThis = new SpeechSynthesisUtterance("Hello, world!");
utterThis.voice = selectedVoice;
utterThis.pitch = 1;
utterThis.rate = 1;
synth.speak(utterThis);
```

https://developer.mozilla.org/en-US/docs/Web/API/Window/speechSynthesis

PUSH NOTIFICATION

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
PushEvent 🧪	42	16 🚩	44 ★	No	37	No	No	42	No	44	37	No	4.0
PushEvent() constructor 🧪	42	16 🚩	44 ★	No	37	No	No	42	No	44	37	No	4.0
data 🧪	57	16 🚩	44 ★	No	44	No	No	57	No	44	43	No	4.0

MDN web docs: https://developer.mozilla.org/en-US/docs/Web/API/Push_API
Safari supports a custom implementation https://developer.apple.com/notifications/safari-push-notifications/

BLUETOOTH

COMPATIBILITY

	Desktop						Mobile						
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	Android webview	Chrome for Android	Edge Mobile	Firefox for Android	Opera for Android	Safari on iOS	Samsung Internet
Bluetooth ⚗	56 ★	?	?	No	43 ★	?	No	56	?	?	43	?	?
getAvailability ⚗	56 ★	?	?	No	43 ★	?	No	56	?	?	43	?	?
onavailabilitychanged ⚗	56 ★	?	?	No	43 ★	?	No	56	?	?	43	?	?
referringDevice ⚗	56 ★	?	?	No	43 ★	?	No	56	?	?	43	?	?
requestDevice ⚗	56 ★	?	?	No	43 ★	?	No	56	?	?	43	?	?

MDN web docs: https://developer.mozilla.org/en-US/docs/Web/API/Web_Bluetooth_API

That's all Folks!