Modern Web Fun
Was die Web-Plattform alles kann

Christian Liebel

@christianliebel

Thinktecture AG

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tecture

Gestatten?

Christian Liebel
Thinktecture AG

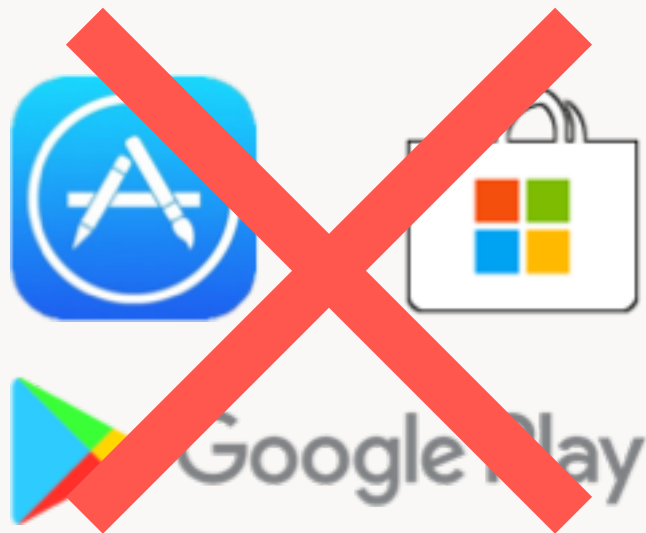Microsoft MVP Visual Studio and Development Technologies

Twitter: @christianliebel
E-Mail: christian.liebel@thinktecture.com

https://thinktecture.com
https://christianliebel.com

Progressive Web Apps

Apps Tomorrow/The Web is Becoming (More) Native

- Idea: No App Store required any longer
- Web App = App App
- Feature Parity: Native Experience with Push Notifications, Offline Availability, ...

- Powered by Google, ready to use on Android today
- Downwards compatible (Progressive Enhancement)
- PWA are no technology, but a collection of features

Agenda

Ambient Light

WebGL

Web Audio API

Gamepad API

Service Worker

Payment Request

Vibration API

Pointer Pressure

Agenda

Ambient Light	WebGL	Web Audio API	Gamepad API
Service Worker	Payment Request	Vibration API	Pointer Pressure

Ambient Light Sensor API

W3C Working Draft

Light intensity in lux

Depending on the environment:

- Change colors and contrasts

- Change the exposure needed for a picture

- …

Ambient Light Sensor API
W3C Working Draft

```
window.addEventListener('devicelight', () => …)
```

Live Demo
https://liebel.io/mw-ambient

Ambient Light Sensor 📄 - CR

Defines a concrete sensor interface to monitor the ambient light level or illuminance of the device's environment.

Usage
% of all users
Global   0.17% + 5.1% = 5.27%
Germany   0.61% + 8.71% = 9.31%

Current aligned | Usage relative | Date relative   Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	[1] 16	[1] 59	[2] 65		11.2				4
11	[1] 17	[1] 60	[2] 66	11.1	11.3	all	66	11.8	6.2
	[1] 18	[1] 61	[2] 67	12					
		[1] 62	[2] 68	TP					
			[2] 69						

Notes | Known issues (0) | Resources (7) | Feedback

MS Edge status: Preview Release

[1] Implements an outdated version of the spec.

[2] Available by enabling the "Generic Sensor Extra Classes" experimental flag in `about:flags`

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Agenda

Ambient Light	WebGL	Web Audio API	Gamepad API
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WebGL

Khronos Group

Web Graphics Library

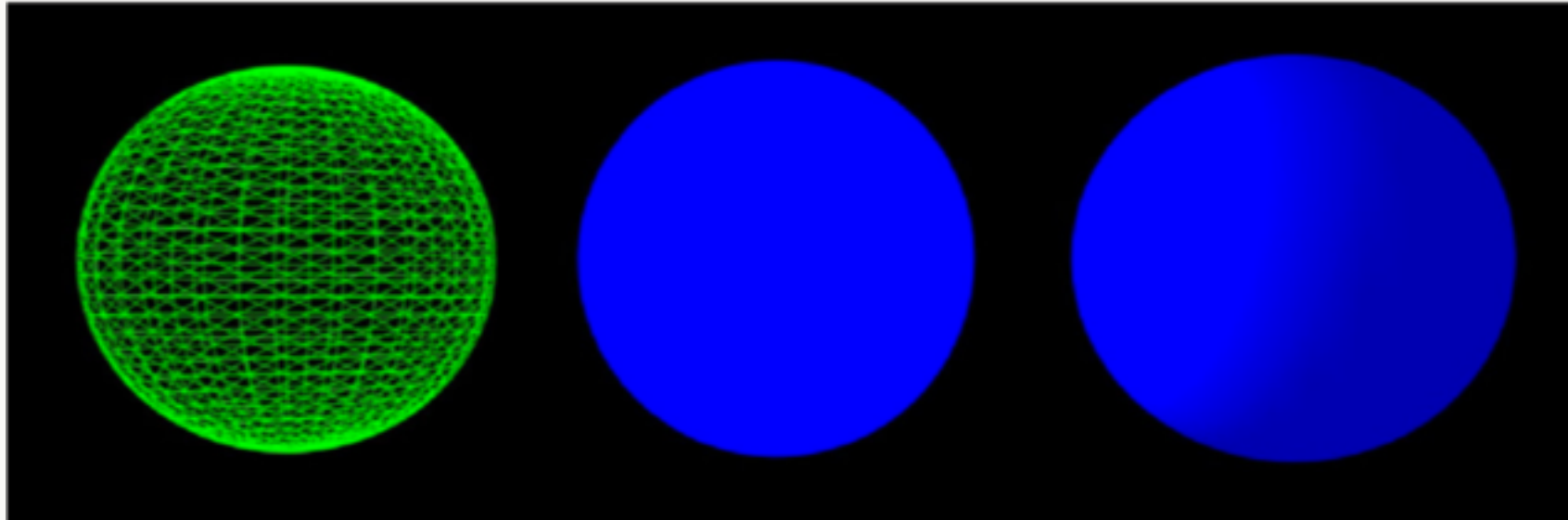OpenGL for Embedded Systems 2.0 (OpenGL ES 2.0)

Hardware accelerated 3D rendering

Canvas context: webgl/experimental-webgl

Blender/Unity can export to WebGL

Library: THREE.js/HoloJS

WebGL

Principle

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Live Demo
https://threejs.org

WebGL - 3D Canvas graphics 📄 - OTHER

Method of generating dynamic 3D graphics using JavaScript, accelerated through hardware

Usage	% of	all users
Global		93.26%
Germany		92.45%

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	[1] 16	59	65		11.2				4
[1] 11	[1] 17	60	66	11.1	11.3	all	66	[1] 11.8	6.2
	[1] 18	61	67	12					
		62	68	TP					
			69						

Notes | Known issues (1) | Resources (11) | Feedback

WebGL support is dependent on GPU support and may not be available on older devices. This is due to the additional requirement for users to have up to date video drivers.

Note that WebGL is part of the Khronos Group, not the W3C.

[1] WebGL context is accessed from "experimental-webgl" rather than "webgl"

Agenda

Ambient Light

WebGL

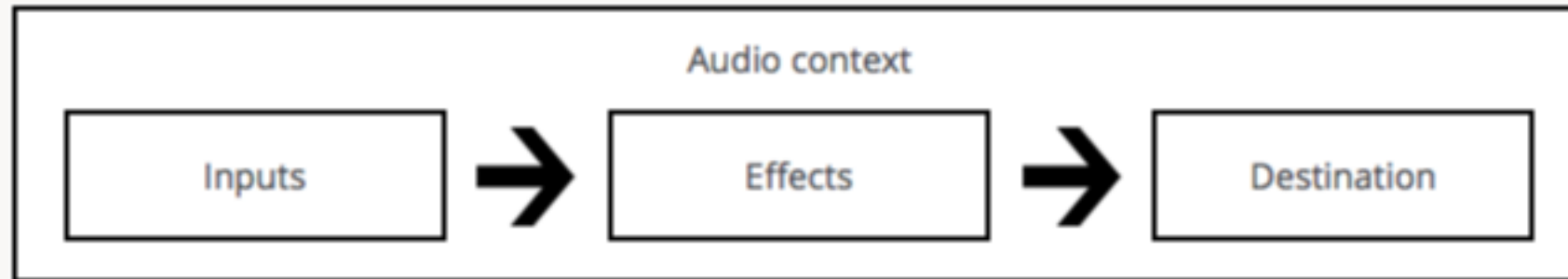Web Audio API

Gamepad API

Service Worker

Payment Request

Vibration API

Pointer Pressure

Web Audio API
W3C Editor's Draft

https://developer.mozilla.org/de/docs/Web/API/Web_Audio_API

Web Audio API

Related APIs

- Speech Synthesis
  - https://developer.mozilla.org/en-US/docs/Web/API/SpeechSynthesisUtterance
- Speech Recognition
  - https://www.google.com/intl/en/chrome/demos/speech.html
- Microphone access via Media Capture and Streams API
  - https://developer.mozilla.org/en-US/docs/Web/API/MediaDevices/getUserMedia

Live Demo
https://liebel.io/mw-audio

Live Demo
https://liebel.io/mw-speech

Web Audio API 📄 - WD

High-level JavaScript API for processing and synthesizing audio

Usage   % of [all users ⇅]
Global   90.13%
  unprefixed: 77.82%
Germany   89.12%
  unprefixed: 66.07%

[Current aligned] Usage relative Date relative   [Show all]

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	16	59	65		11.2				4
11	17	60	66	11.1	11.3	all	66	11.8	6.2
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		62	68	TP					
			69						

Notes   Known issues (1)   Resources (10)   Feedback

Not all browsers with support for the Audio API also support media streams (e.g. microphone input). See the getUserMedia/Streams API data for support for that feature.

Firefox versions < 25 support an alternative, deprecated audio API.

Chrome support went through some changes as of version 36.

Agenda

Ambient Light	WebGL	Web Audio API	Gamepad API
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Gamepad API

Working Draft

Natively interact with gamepads

Access axes and buttons via JavaScript

No plugin required

Chrome: User-mode driver for Xbox 360 gamepad on macOS

Gamepad API

Usages

Games
Presentations
…?

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Live Demo
https://liebel.io/mw-gamepad

Live Demo
http://flightarcade.com

Gamepad API 📄 - WD

API to support input from USB gamepad controllers through JavaScript.

Usage	% of	all users	
Global			88.8%
unprefixed:			88.75%
Germany			87.05%
unprefixed:			87.01%

| Current aligned | Usage relative | Date relative | | Show all |

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	16	59	65		11.2				4
11	17	60	66	11.1	11.3	all	66	11.8	6.2
	18	61	67	12					
		62	68	TP					
			69						

| Notes | Known issues (0) | Resources (8) | Feedback |

No notes

Agenda

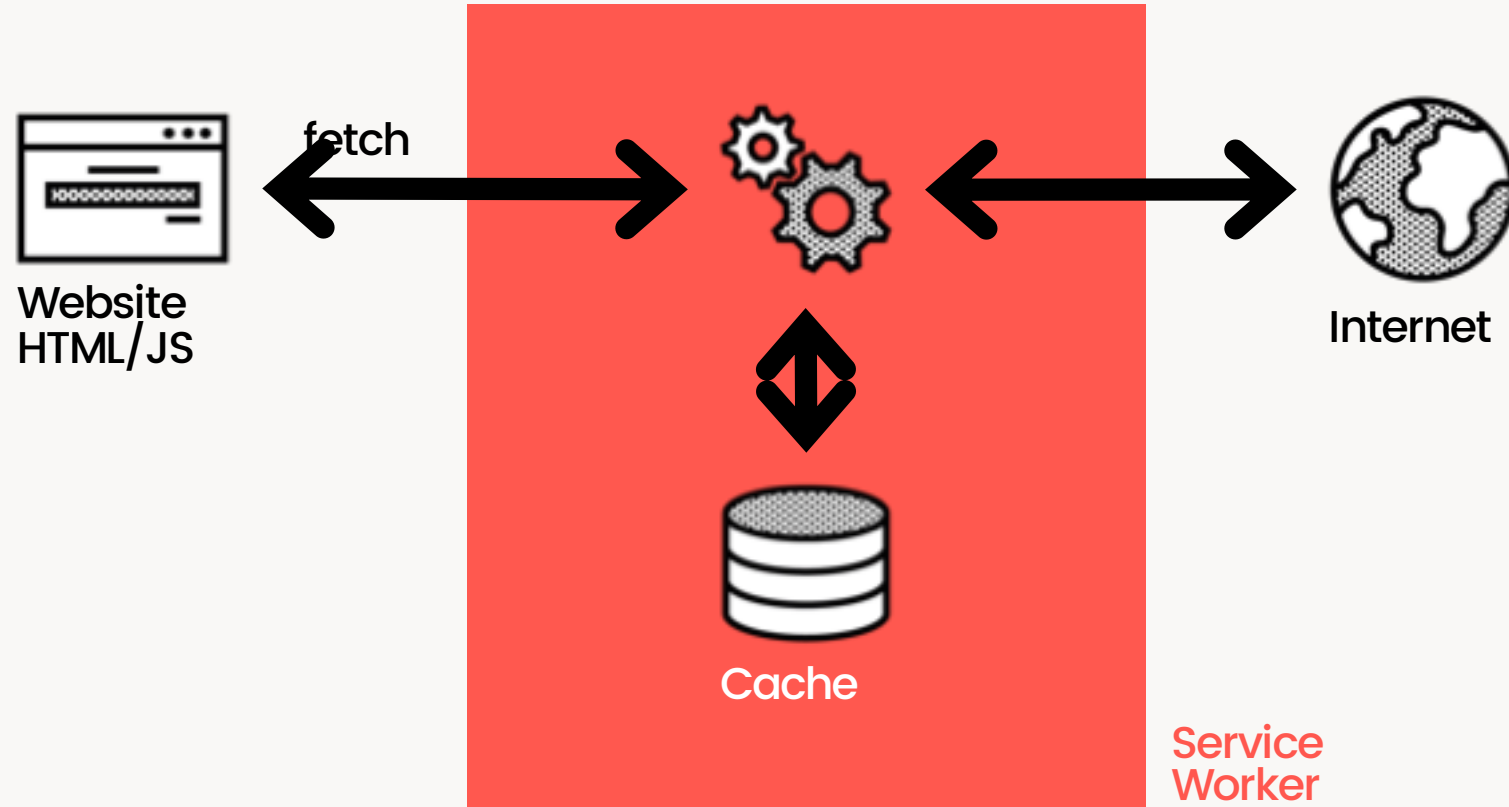|			
Ambient Light	WebGL	Web Audio API	Gamepad API
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Service Worker as Proxy/Interceptor

Service Worker

Connection Independence

Problem: The quality of internet connection broadly varies (especially when travelling)

Lie-Fi: Low signal strength of public WiFi/completely offline
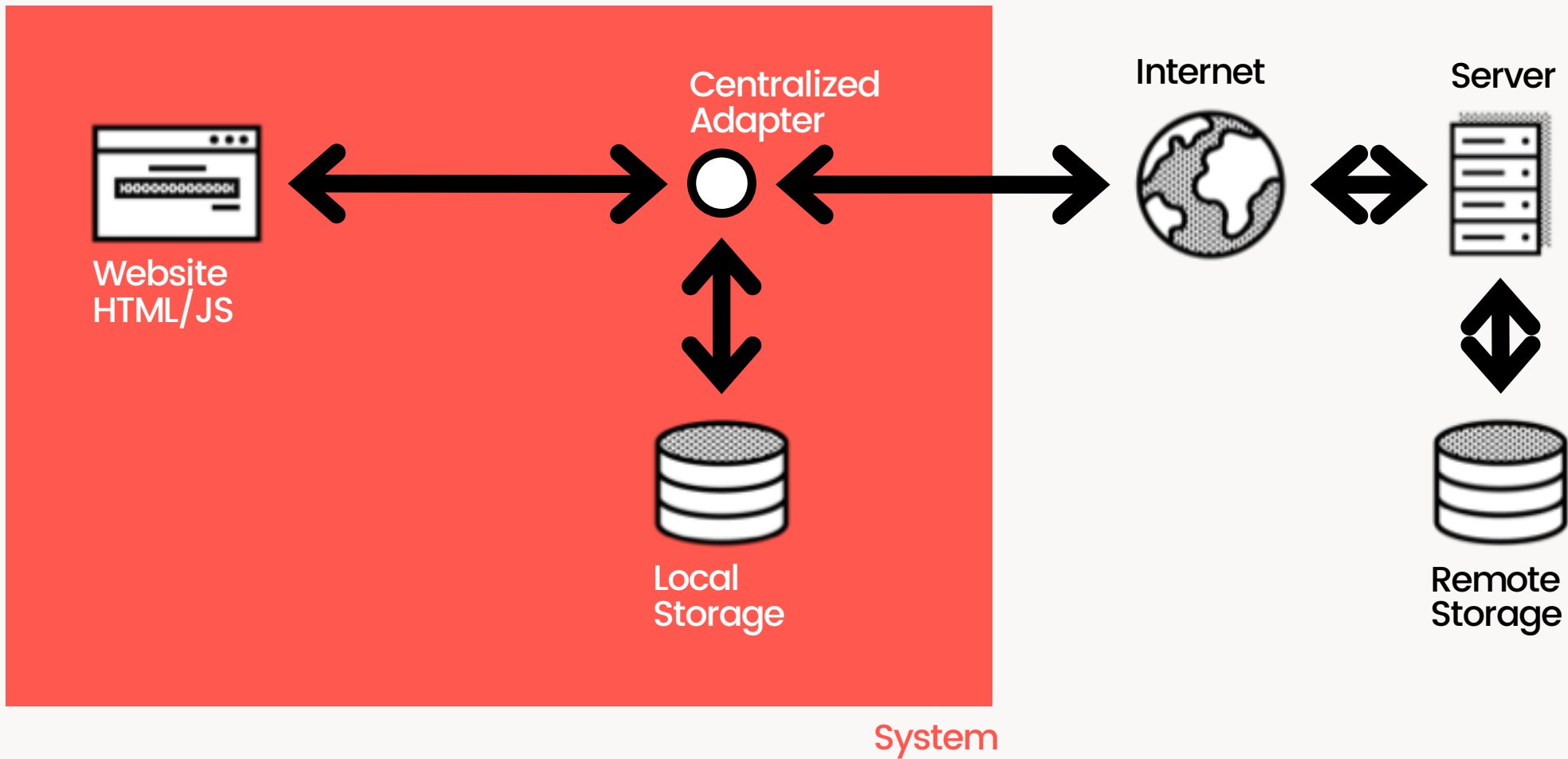
Goal: App also works offline/low signal strength

...or at least as good as possible (e.g. OneNote)

This means: Local data storage required

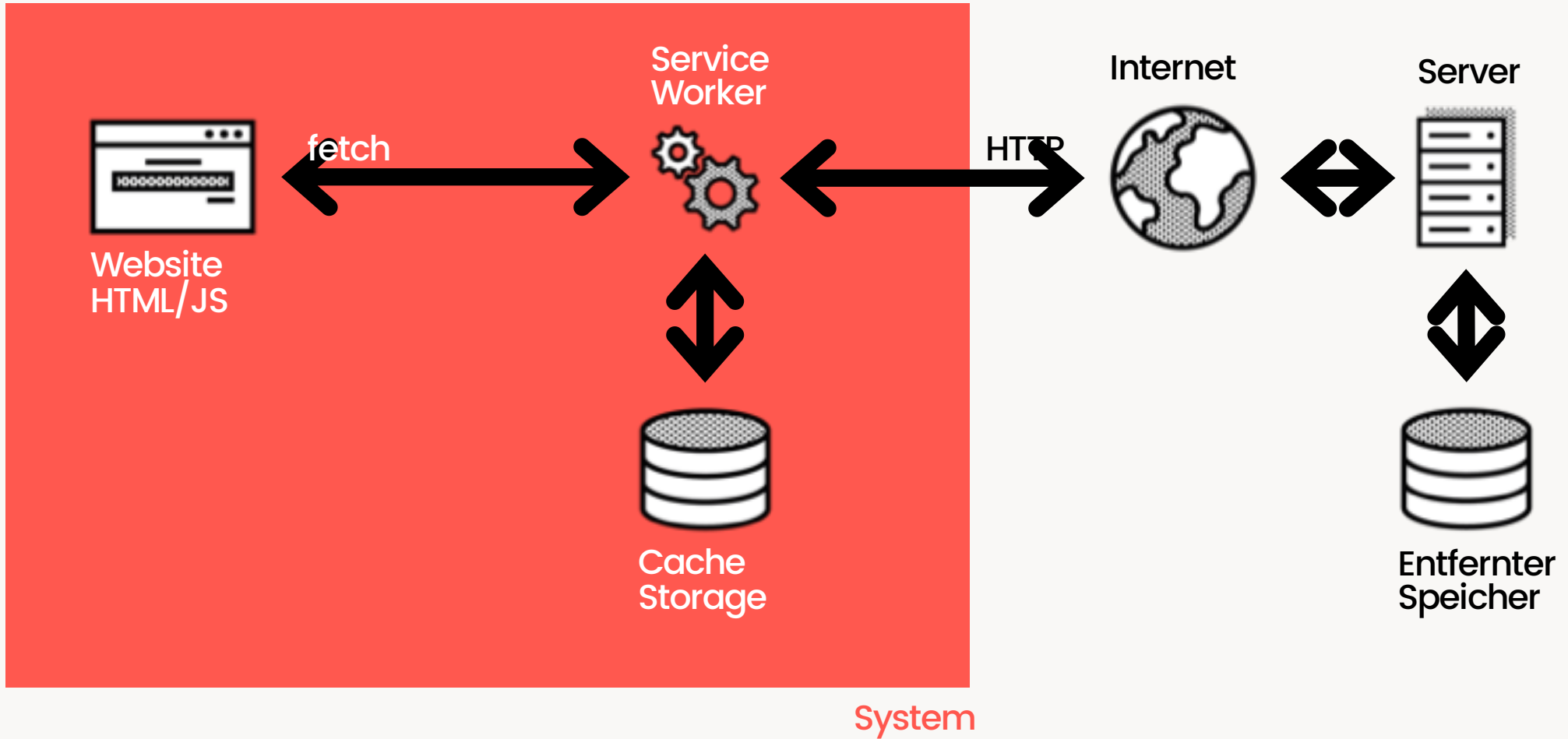Bidirectional: Data synchronization/Conflict resolution (e.g. Web Background Synchronization)

Offline Availability
Concept

Offline Availability
With Service Worker

Live Demo
https://pwa.liebel.io

Service Workers 🗎 - WD

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

Usage		
	% of	all users ↕
Global	83.07% + 0.17% =	83.24%
Germany	77.31% + 0.34% =	77.64%

`Current aligned` Usage relative Date relative **Show all**

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	[2] 16 🚩	59	65		11.2				4
11	**17**	**60**	**66**	**11.1**	**11.3**	**all**	**66**	**11.8**	**6.2**
	18	61	67	12					
		62	68	TP					
			69						

Notes   Known issues (0)   Resources (8)   Feedback

Details on partial support can be found on is ServiceWorker Ready?

[2] Available behind the "Enable service workers" flag

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Service Worker
Push Notifications

Goal: Get users back to (re-)use the app
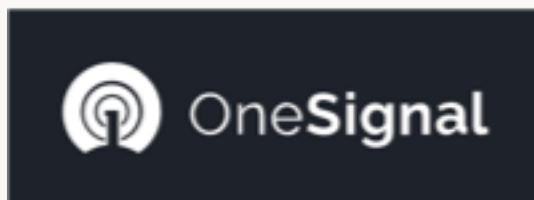Known from social networks, games, …

Implementation via ServiceWorker's PushManager

Problem: Endpoint is defined by plattform provider (GCM, WNS, …)

Problem: Apple only supports proprietary push protocol

Provider and push services must be known to backend/server component

Third-party services:

(free, but collecting data!)

Live Demo
https://liebel.io/mw-push

Agenda

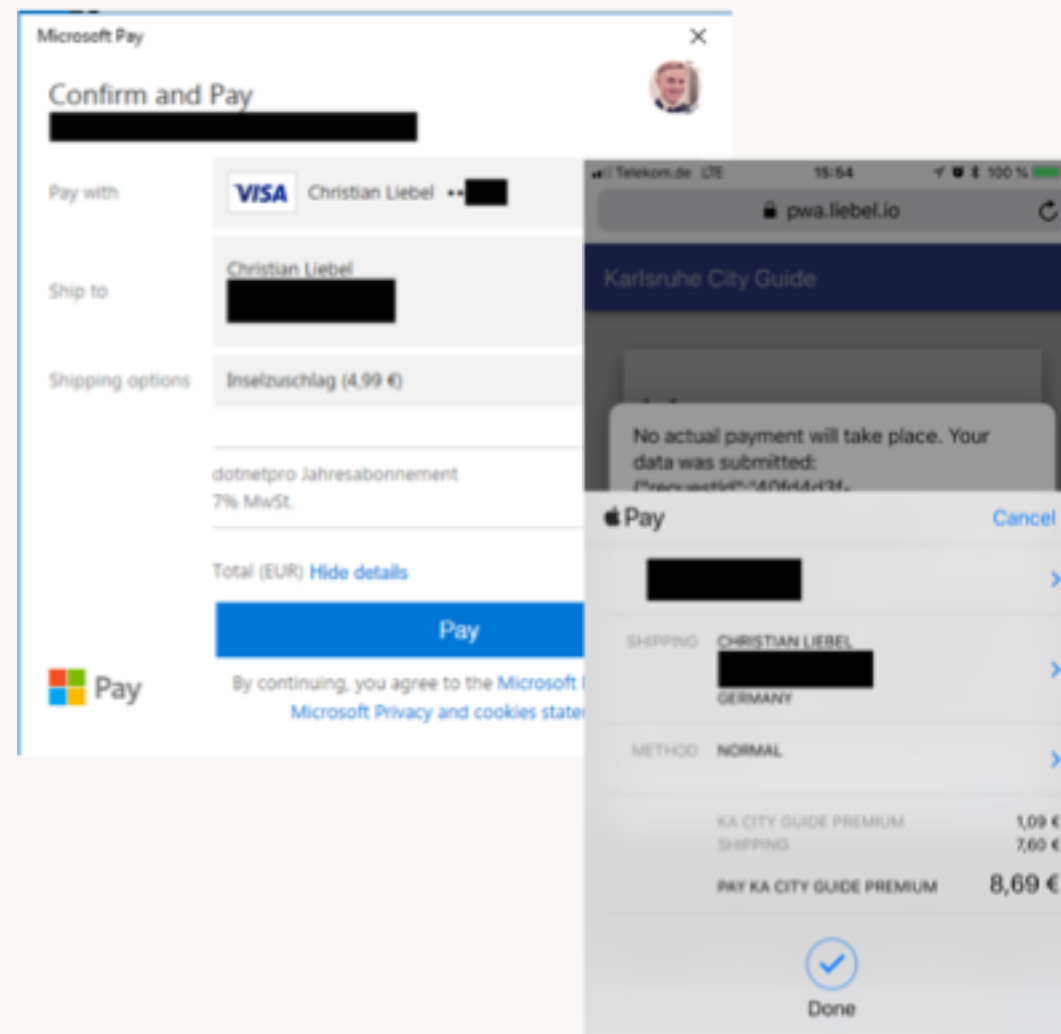|			
Ambient Light	WebGL	Web Audio API	Gamepad API
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Progressive Web Apps

Monetarization

Payment Request API

Upcoming payment technology for the web

User agent/platform provider already knows your personal information and payment data

PRA provides a consistent UI across all web sites, online shops and Progressive Web Apps and prefills it with your personal information

Live Demo
https://pwa.liebel.io

Payment Request API 📄 - CR

Payment Request is a new API for the open web that makes checkout flows easier, faster and consistent on shopping sites.

Usage   % of all users
Global   68.29%
Germany   67.63%

| Current aligned | Usage relative | Date relative | | Show all |

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	16	59	65		11.2				4
11	17	60	66	11.1	11.3	all	66	11.8	6.2
	18	61	67	12					
		62	68	TP					
			69						

| Notes | Known issues (0) | Resources (11) | Feedback |

Apple provides an equivalent proprietary API called Apple Pay JS. Google provides a PaymentRequest wrapper for Apple Pay JS.
Firefox status: in-development

[3] Apple's proprietary implementation (see above)

[5] Unlike Desktop Chrome, support has been in Chrome for Android since version 53.

[6] Can be enabled via the `dom.payments.request.enabled` flag in "about:config" flag since 55.

Agenda

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Vibration API

Haptically inform the user about an event
(i.e. game starts after a long matchmaking phase)

Vibration API allows the developer to

– vibrate for a given period of time (e.g. 250 ms)
– vibrate with a given pattern (e.g. S–O–S)

Supported on mobile Android devices with Chrome and Firefox

Vibration API 📱 - REC

Method to access the vibration mechanism of the hosting device.

Usage	% of all users
Global	77.09%
unprefixed:	77.06%
Germany	64.98%
unprefixed:	64.98%

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	16	59	65		11.2				4
11	17	60	66	11.1	11.3	all	66	11.8	6.2
	18	61	67	12					
		62	68	TP					
			69						

Notes | Known issues (0) | Resources (10) | Feedback

MS Edge status: Under Consideration
WebKit status: Removed

Live Demo
https://liebel.io/mw-vibration

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Pointer Pressure

Pointer Pressure

Force Touch aka 3D Touch aka ...

Some devices allow secondary functions by pressing UI items with force
Requires force sensor (i.e. pen input, 3D/Force Touch on Apple devices)

Exposed to the browser via Pointer Events

3D/Force Touch: Proprietary implementation

Library for all of them: **PressureJS**
(Safari on macOS, browsers on iOS, Chrome/Edge/IE on Windows)

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Live Demo
https://liebel.io/mw-forcetouch

Pointer events 📄 - REC

This specification integrates various inputs from mice, touchscreens, and pens, making separate implementations no longer necessary and authoring for cross-device pointers easier. Not to be mistaken with the unrelated "pointer-events" CSS property.

Usage
% of all users

Global   68.43% + 0.12% = 68.55%
  unprefixed: 68.43%
Germany   64.49% + 0.11% = 64.6%
  unprefixed: 64.49%

Current aligned | Usage relative | Date relative   Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
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11	17	60	66	11.1	11.3	all	66	11.8	6.2
	18	61	67	12					
		62	68	TP					
			69						

Notes | Known issues (0) | Resources (11) | Feedback

Firefox, starting with version 28, provides the 'dom.w3c_pointer_events.enabled' flag to support this specification.

Agenda
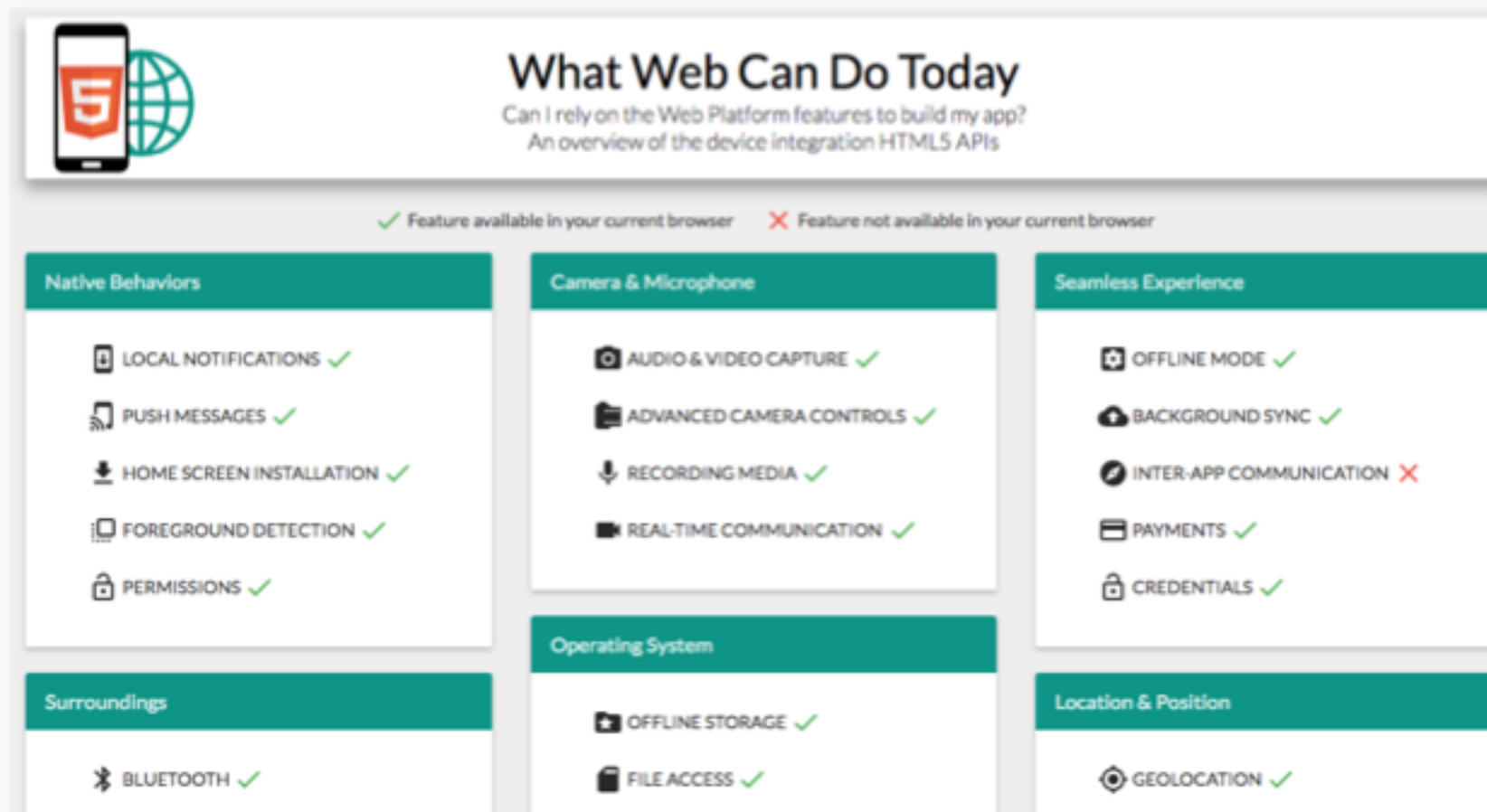
Ambient Light	WebGL	Web Audio API	Gamepad API
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HTML5 Features and Usage Examples

https://whatwebcando.today/

Vielen Dank
für Ihre Aufmerksamkeit

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Christian Liebel
@christianliebel
christian.liebel@thinktecture.com