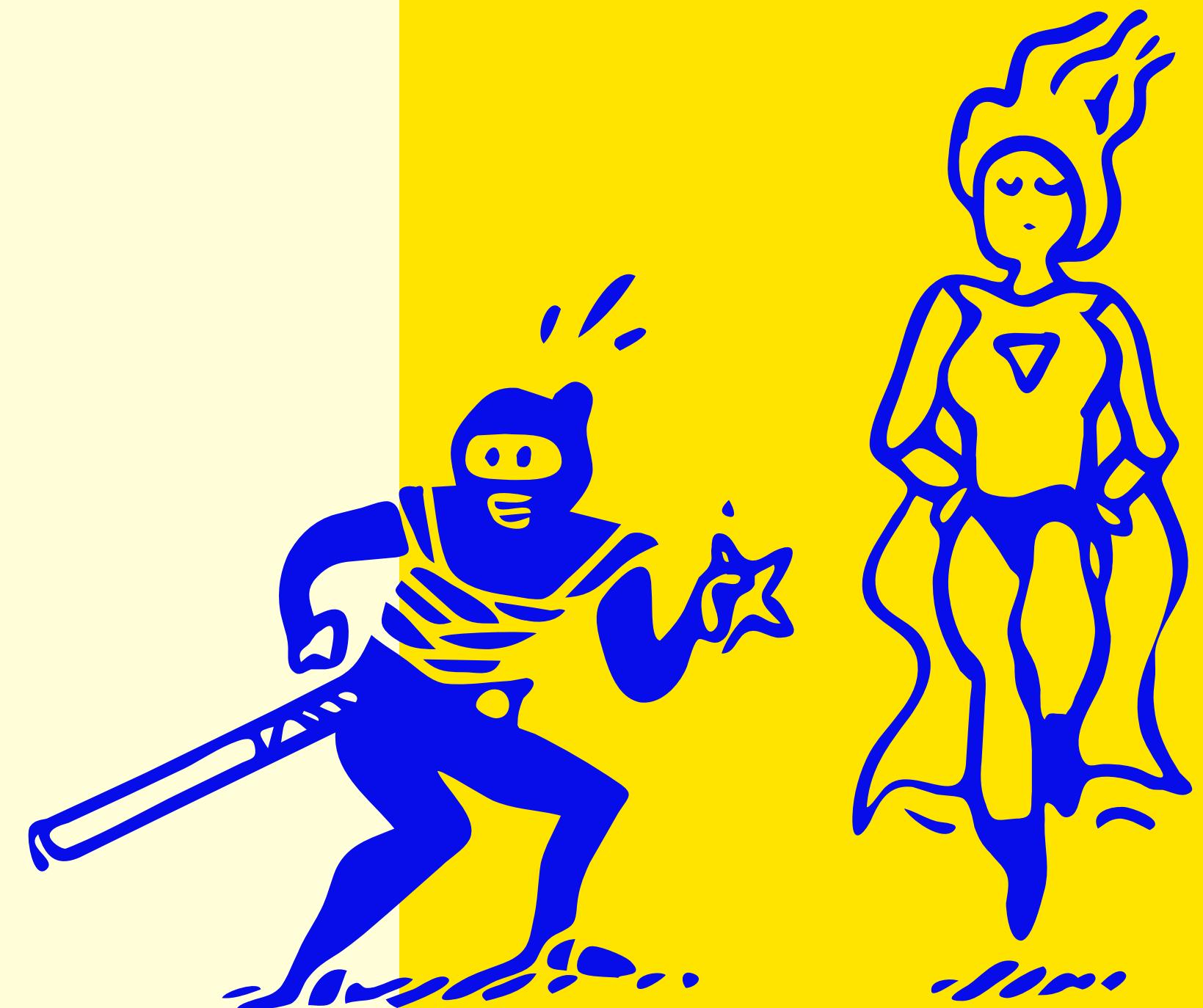


PWAs, a love-hate relationship

Jasper Moelker // 13 June 2019

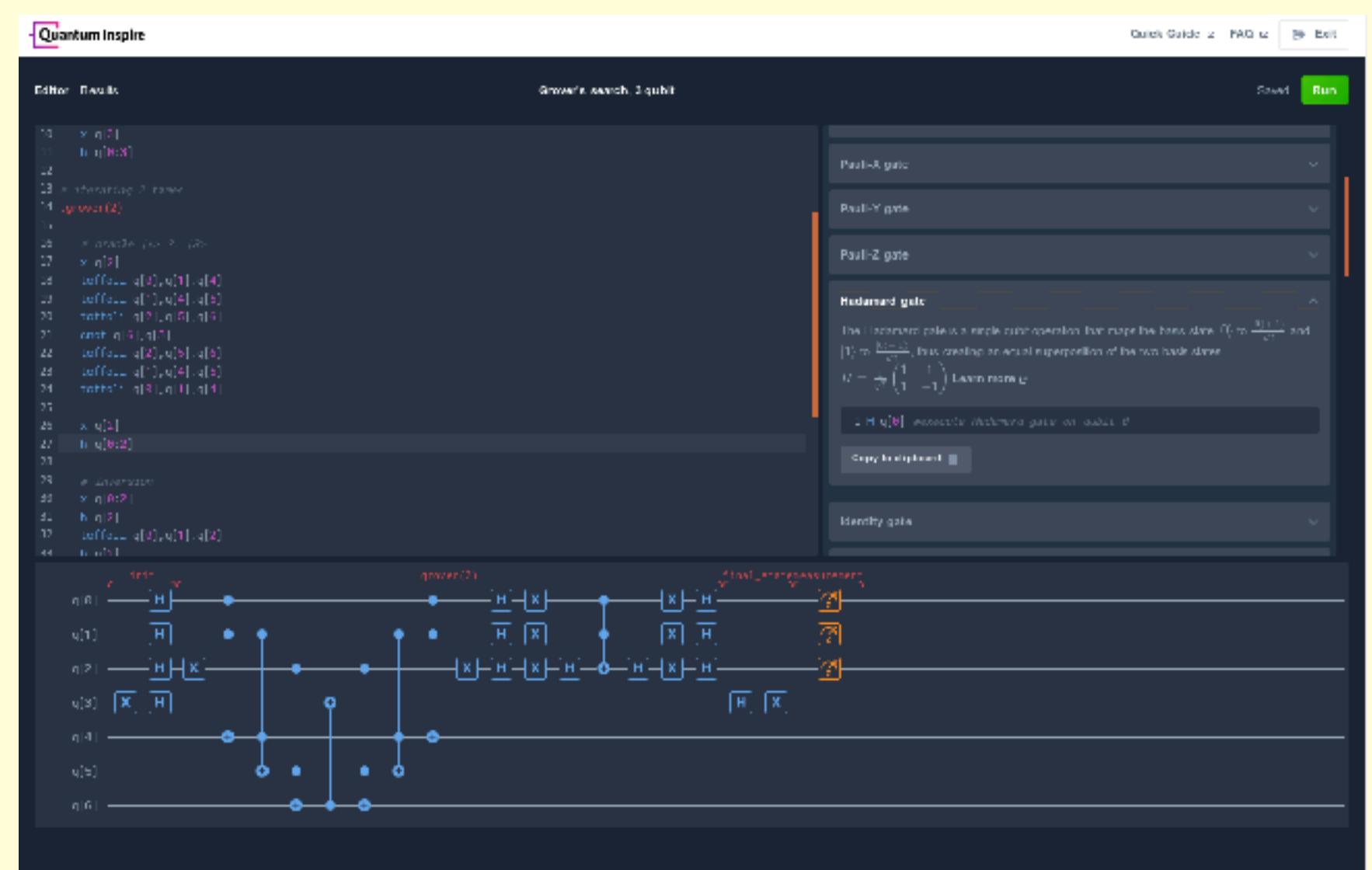




Have we met?



funda



Quantum Inspire



SITA



De Voorhoede

a team of ...

20

front-end developers

02

project managers

located in ...



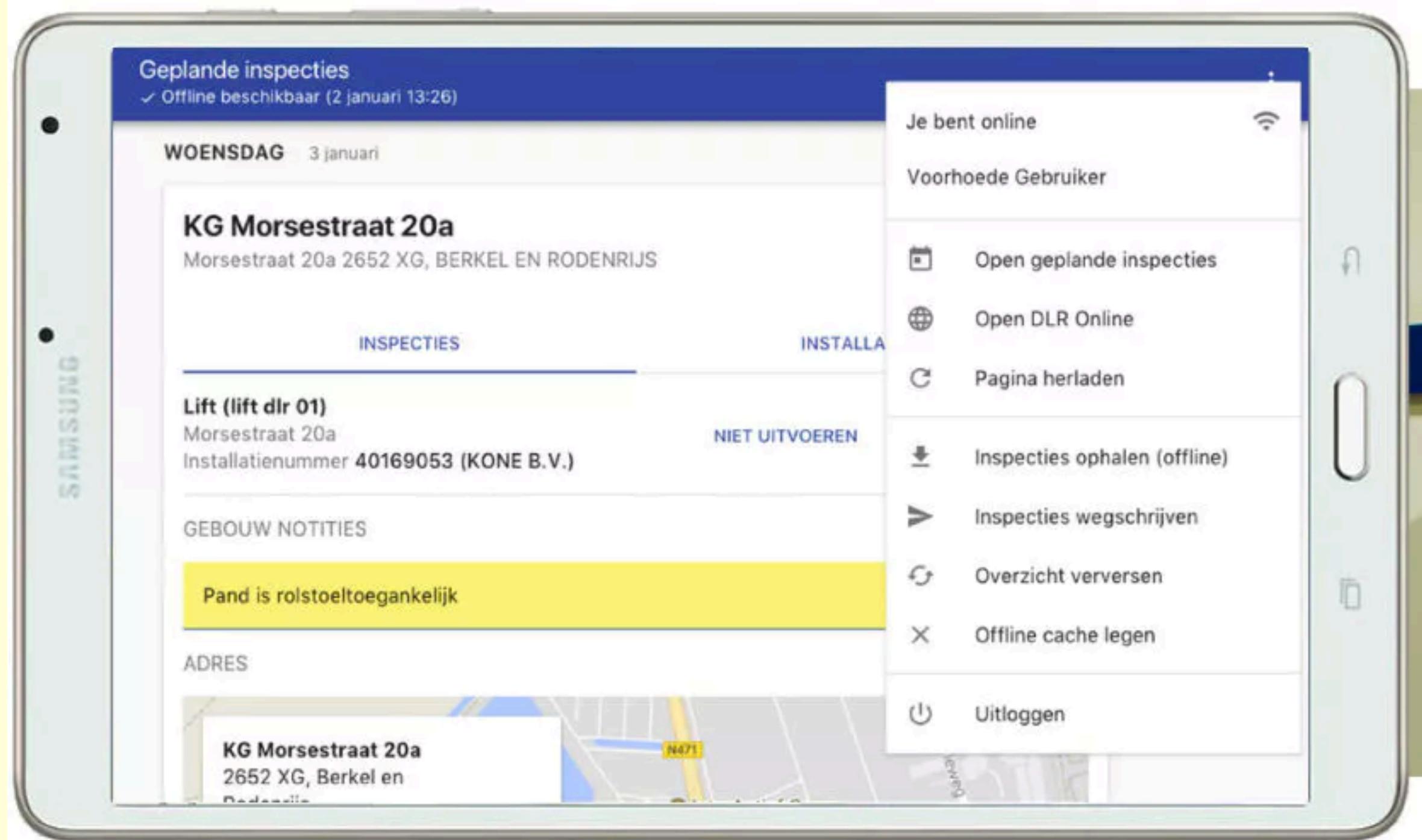
Amsterdam



Delft



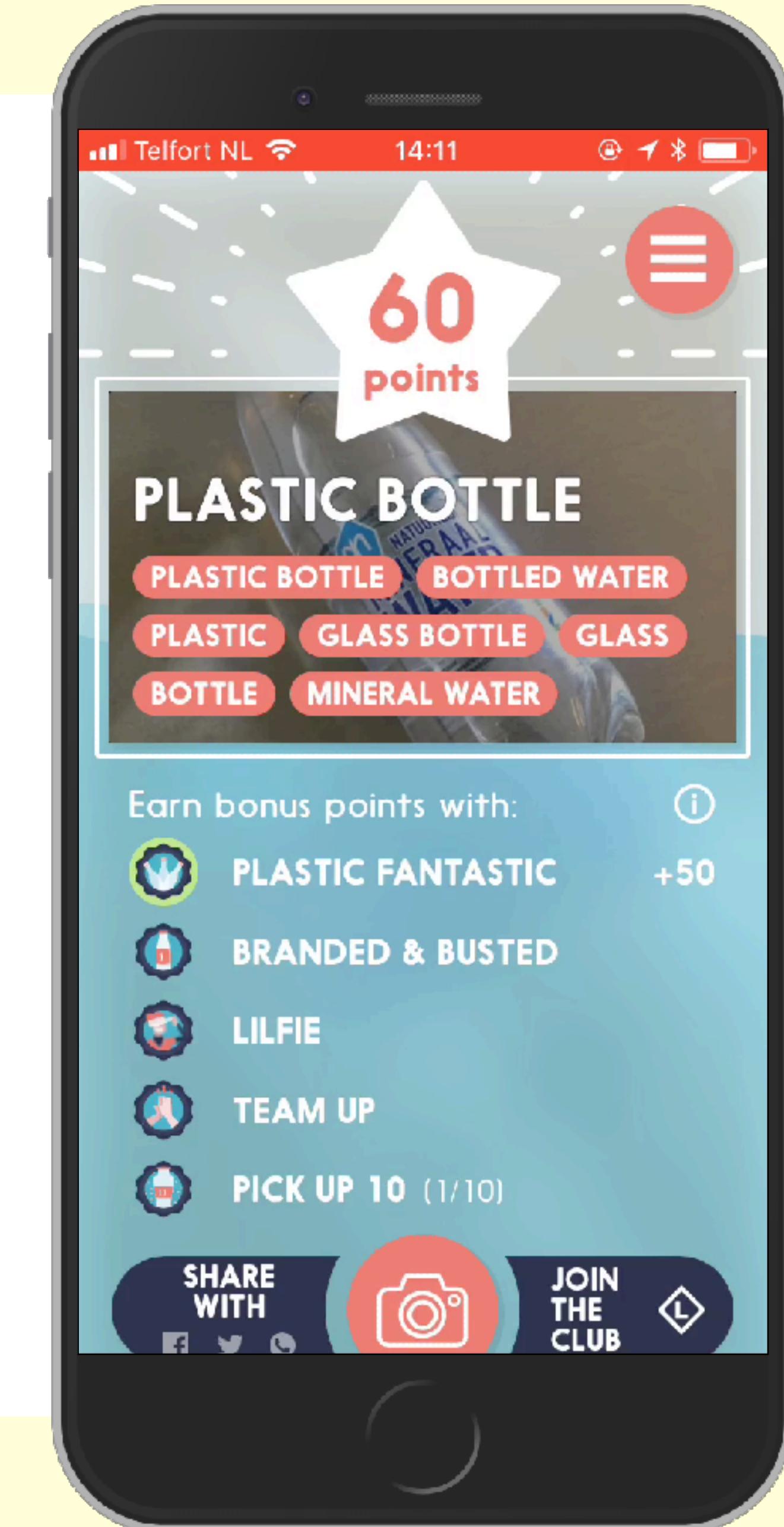
Lift inspection app





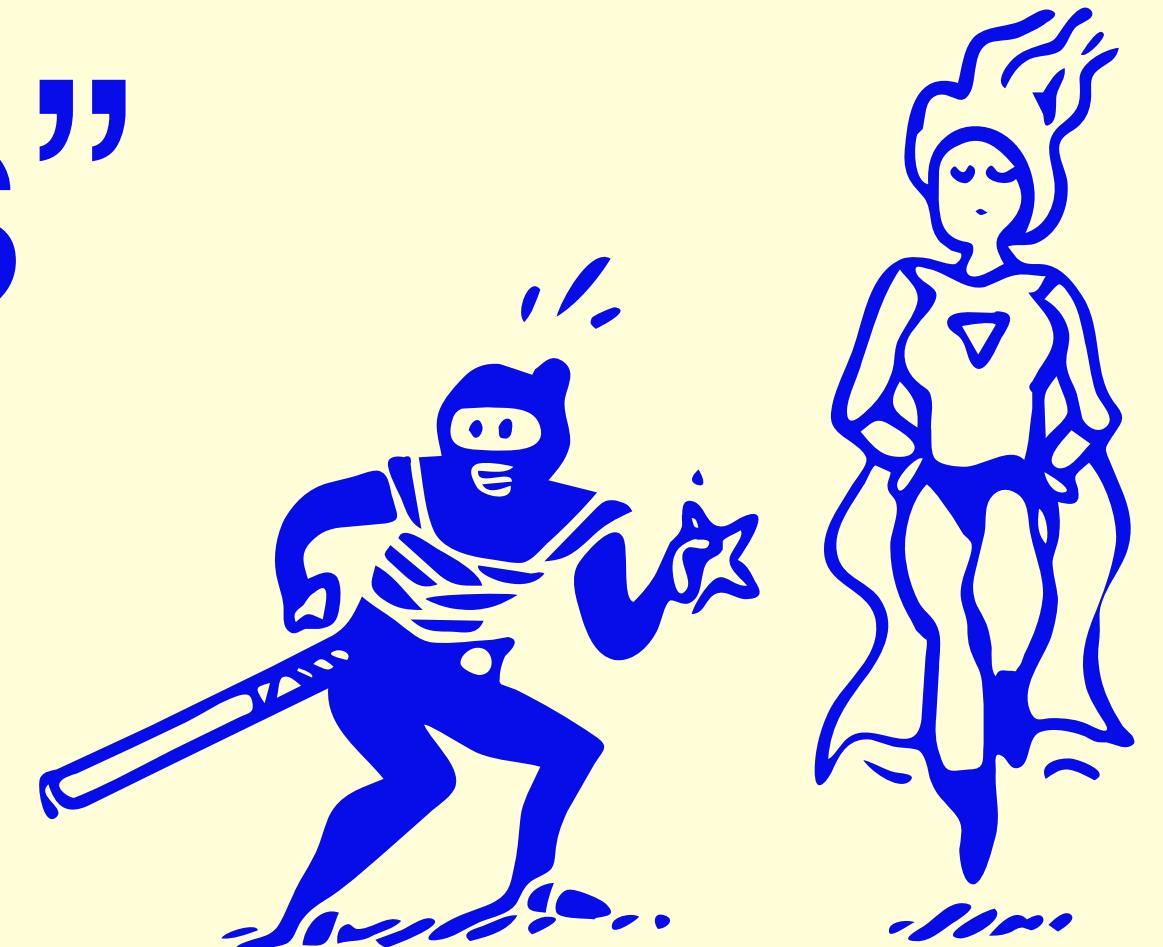
#PickUp10

plastic litter
recognition in a
native-like app





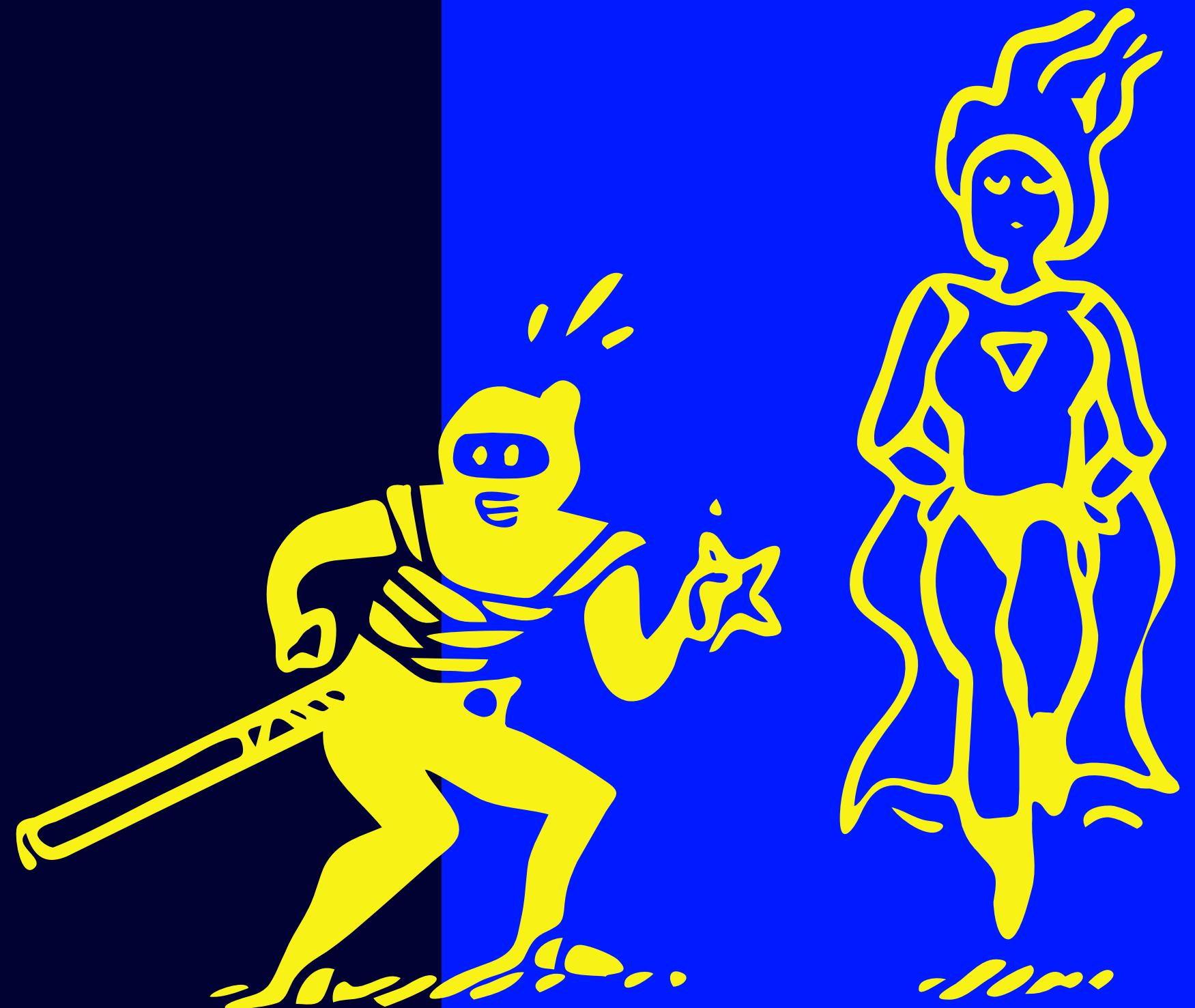
“Progressive Web Apps
are regular websites
with superpowers”





PWA ❤️💔 #1

not all
browsers have
superpowers





Chrome on Android (2019-06)

Native Behaviors	Seamless Experience	Surroundings	Input
<ul style="list-style-type: none">LOCAL NOTIFICATIONS ✓PUSH MESSAGES ✓HOME SCREEN INSTALLATION ✓FOREGROUND DETECTION ✓PERMISSIONS ✓	<ul style="list-style-type: none">OFFLINE MODE ✓BACKGROUND SYNC ✓INTER-APP COMMUNICATION ✓PAYMENTS ✓CREDENTIALS ✓	<ul style="list-style-type: none">BLUETOOTH ✓USB ✓NFC ✘PROXIMITY SENSORS ✘AMBIENT LIGHT ✘	<ul style="list-style-type: none">TOUCH GESTURES ✓SPEECHrecognition ✓CLIPBOARD (COPY & PASTE) ✓POINTING DEVICE ADAPTATION ✓

Location & Position	Device Features	Screen & Output	Camera & Microphone
<ul style="list-style-type: none">GEOLOCATION ✓GEOFENCING ✘DEVICE ORIENTATION ✓DEVICE MOTIONS ✓PROXIMITY SENSORS ✘	<ul style="list-style-type: none">NETWORK TYPE & SPEED ✓ONLINE STATE ✓VIBRATION ✓BATTERY STATUS ✓DEVICE MEMORY ✓	<ul style="list-style-type: none">VIRTUAL & AUGMENTED REALITY ✓FULLSCREEN ✓SCREEN ORIENTATION & LOCK ✓WAKE LOCK ✘PRESENTATION FEATURES ✓	<ul style="list-style-type: none">AUDIO & VIDEO CAPTURE ✓ADVANCED CAMERA CONTROLS ✓RECORDING MEDIA ✓REAL-TIME COMMUNICATION ✓



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



Help,
my user have
an iPhone

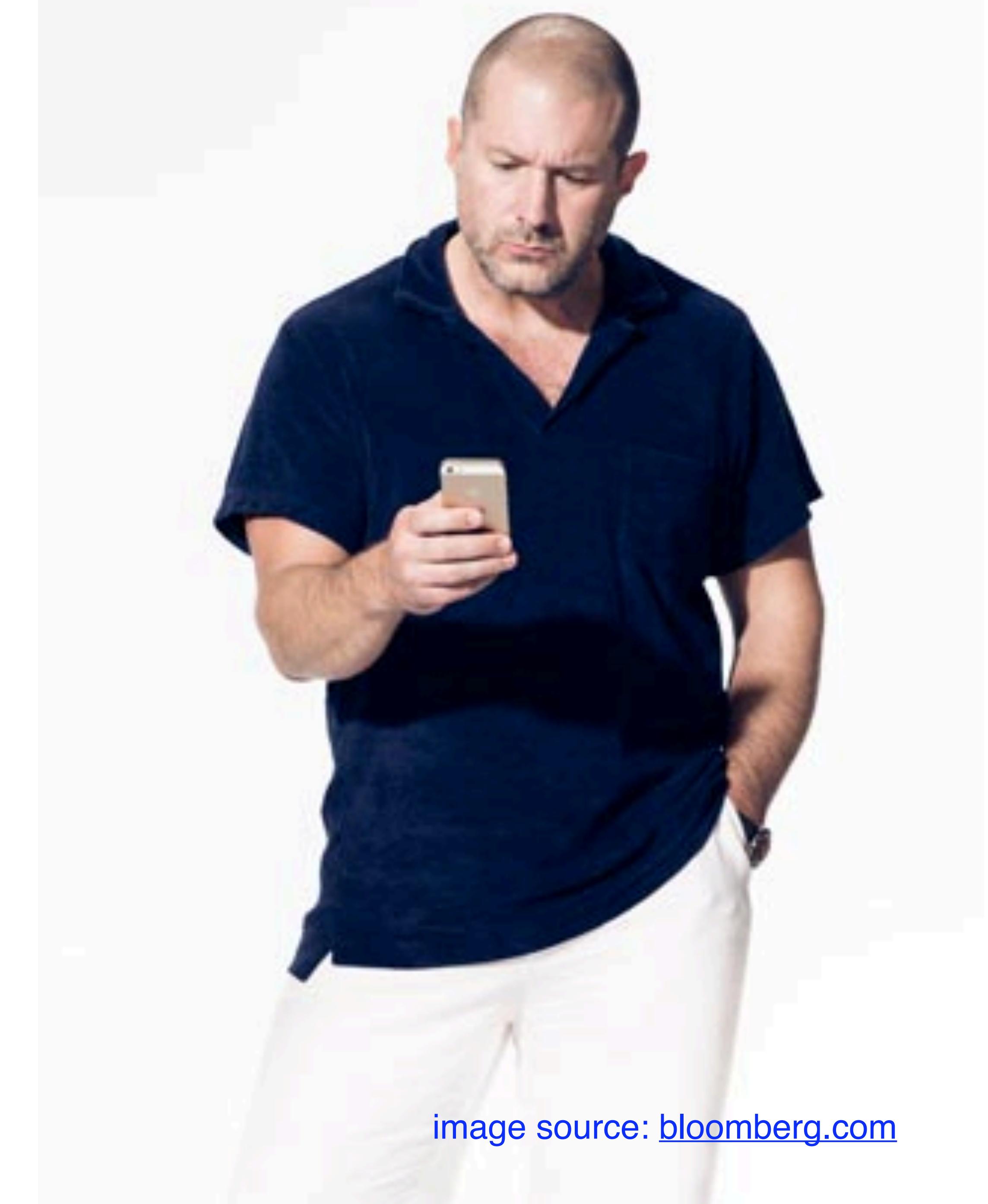


image source: bloomberg.com



Safari on iOS (2019-06)

Native Behaviors	Seamless Experience	Surroundings	Input
<ul style="list-style-type: none">LOCAL NOTIFICATIONS ✅PUSH MESSAGES ❌HOME SCREEN INSTALLATION ❌FOREGROUND DETECTION ✅PERMISSIONS ❌	<ul style="list-style-type: none">OFFLINE MODE ✅BACKGROUND SYNC ❌INTER-APP COMMUNICATION ✅PAYMENTS ✅CREDENTIALS ❌	<ul style="list-style-type: none">BLUETOOTH ✅USB ❌NFC ❌PROXIMITY SENSORS ❌AMBIENT LIGHT ❌	<ul style="list-style-type: none">TOUCH GESTURES ✅SPEECHrecognition ❌CLIPBOARD (COPY & PASTE) ✅POINTING DEVICE ADAPTATION ✅
Location & Position	Device Features	Screen & Output	Camera & Microphone
<ul style="list-style-type: none">GEOLOCATION ✅GEOFENCING ❌DEVICE ORIENTATION ✅DEVICE MOTIONS ✅PROXIMITY SENSORS ❌	<ul style="list-style-type: none">NETWORK TYPE & SPEED ❌ONLINE STATE ✅VIBRATION ❌BATTERY STATUS ❌DEVICE MEMORY ❌	<ul style="list-style-type: none">VIRTUAL & AUGMENTED REALITY ❌FULLSCREEN ❌SCREEN ORIENTATION & LOCK ❌WAKE LOCK ❌PRESENTATION FEATURES ❌	<ul style="list-style-type: none">AUDIO & VIDEO CAPTURE ✅ADVANCED CAMERA CONTROLS ❌RECORDING MEDIA ❌REAL-TIME COMMUNICATION ✅
<p> 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</p> <p>✓ Feature available in your current browser ✗ Feature not available in your current browser</p>			
Operating System			
<ul style="list-style-type: none">OFFLINE STORAGE ✅FILE ACCESS ✅CONTACTS ❌SMS ❌STORAGE QUOTAS ❌TASK SCHEDULING ❌			



PLATFORM ►	iOS			ANDROID			DESKTOP		
CONTEXT ►	APP	WEB	IN-APP	APP	WEB	IN-APP	IE	SAFARI	CHROME AND OTHERS
USAGE ►	6%	15%	6%	4%	22%	5%	4%	3%	35%

▼ FEATURE	INSTALLABLE	AVAILABLE WITHOUT INSTALL	APP STORE PRESENCE	ALWAYS LATEST VERSION	PUSH NOTIFICATIONS	WORKS OFFLINE	ACCESS MEDIA AND LOCATION	LINKABLE	INTER-APP COMM.	APP-LIKE LOOK & FEEL
INSTALLABLE	■	✗	✗	✗	■	✗	✗	✗	✗	✗
AVAILABLE WITHOUT INSTALL	✗	■	■	■	■	■	■	■	■	■
APP STORE PRESENCE	■	✗	✗	✗	■	✗	✗	✗	✗	✗
ALWAYS LATEST VERSION	✗	■	■	■	■	■	■	■	■	■
PUSH NOTIFICATIONS	■	✗	✗	✗	■	■	✗	✗	■	✗
WORKS OFFLINE	■	✗	✗	✗	■	■	■	✗	✗	✗
ACCESS MEDIA AND LOCATION	■	■	■	✗	■	■	✗	✗	✗	✗
LINKABLE	✗	✗	✗	✗	■	■	✗	■	✗	✗
INTER-APP COMM.	■	✗	✗	✗	■	■	✗	■	■	■
APP-LIKE LOOK & FEEL	■	■	■	■	■	■	■	■	■	■



NATIVE TECH



WEB TECH



NOT AVAILABLE



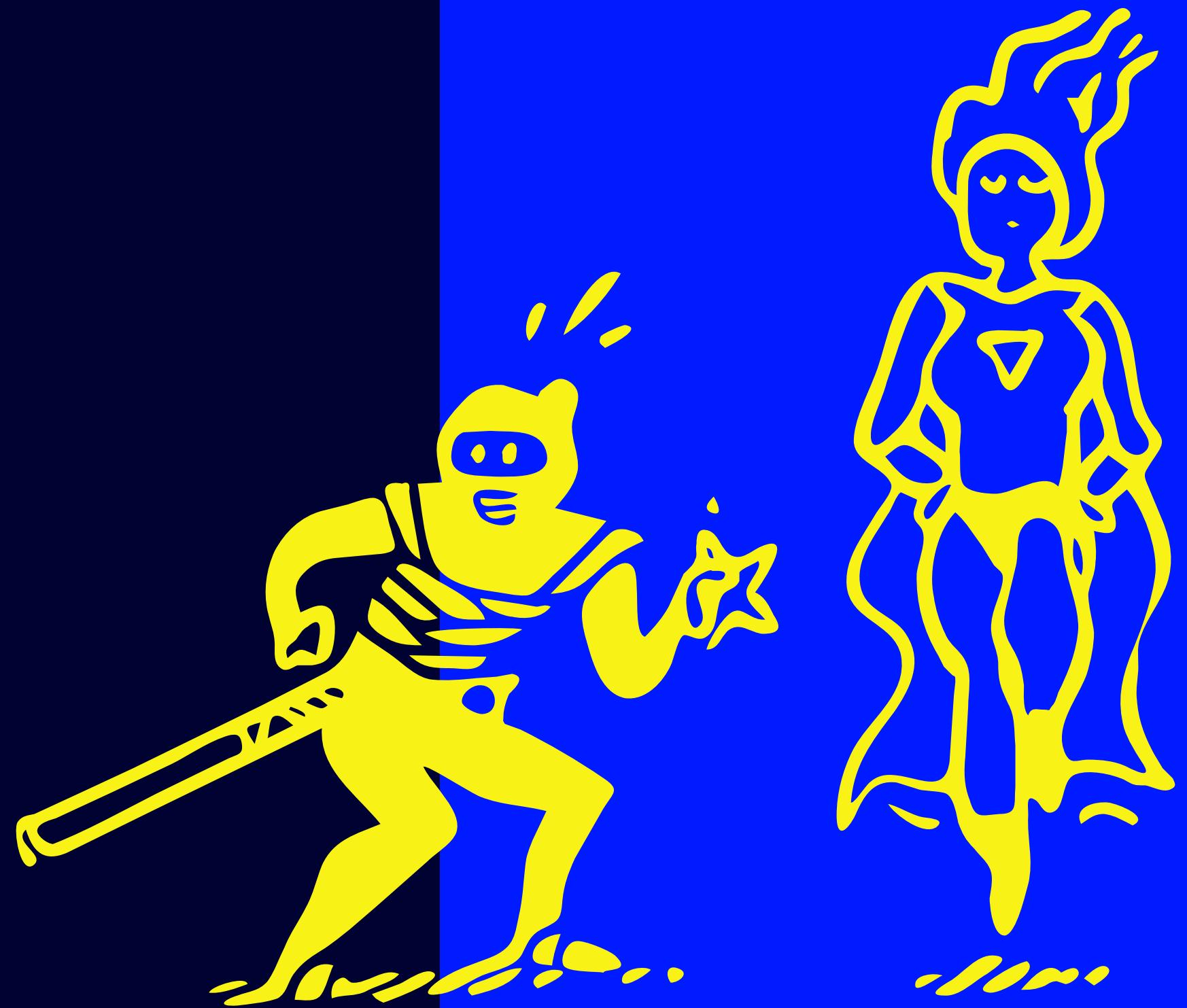
HYBRID

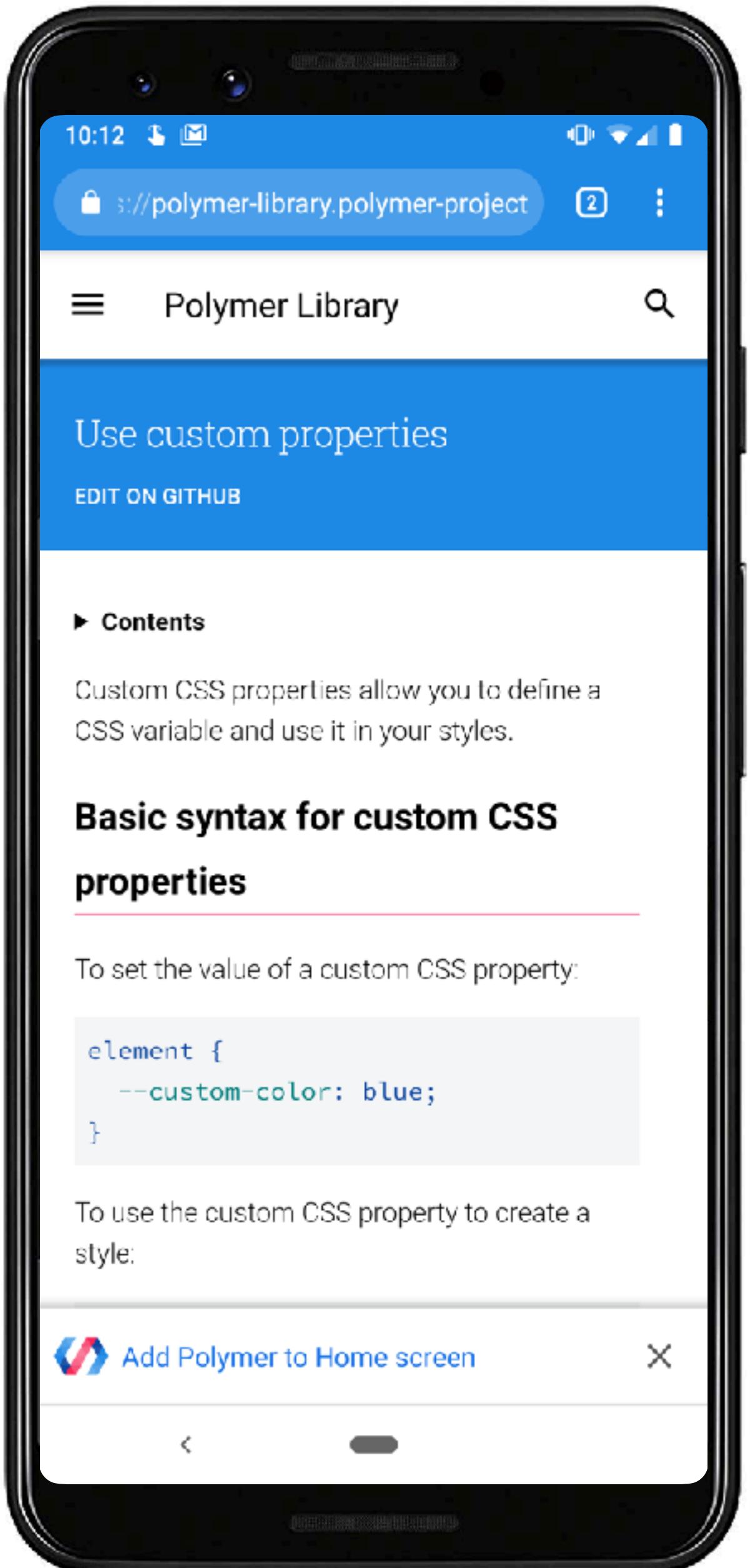
App matrix



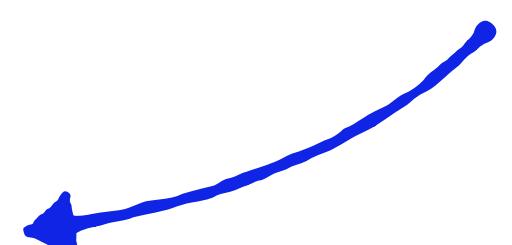
PWA ❤️💔 #2

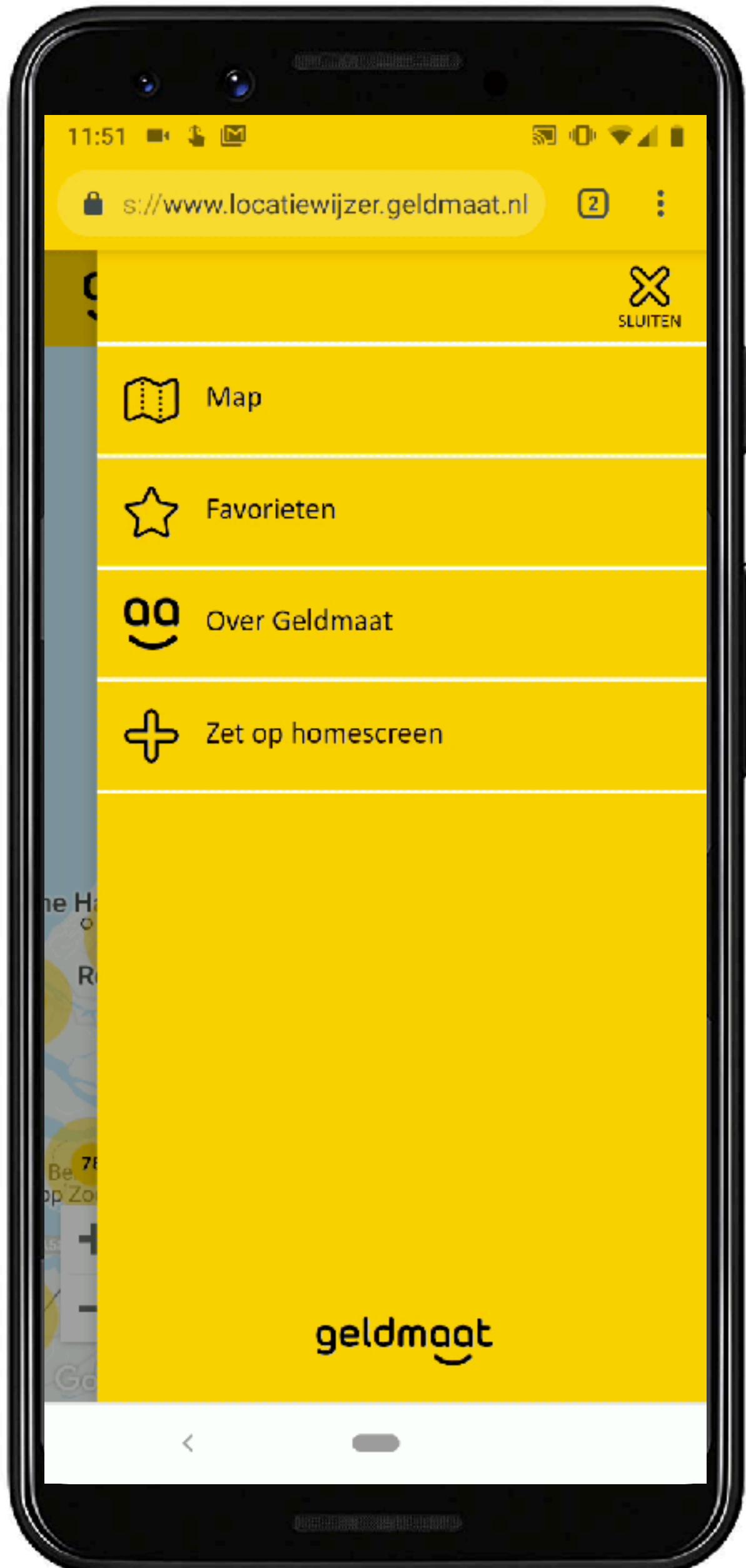
install
in your face





everybody wants
a place on the
home screen

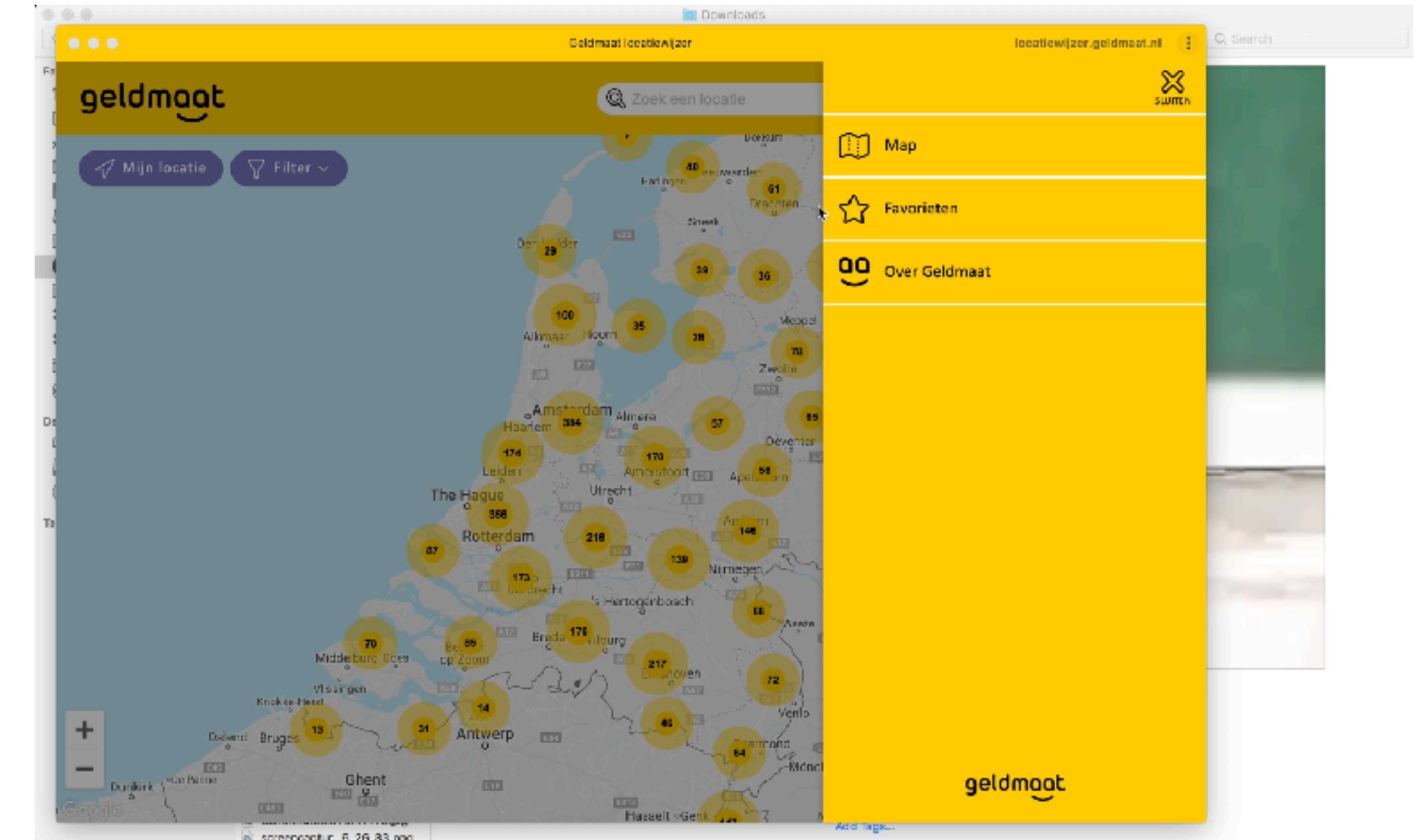
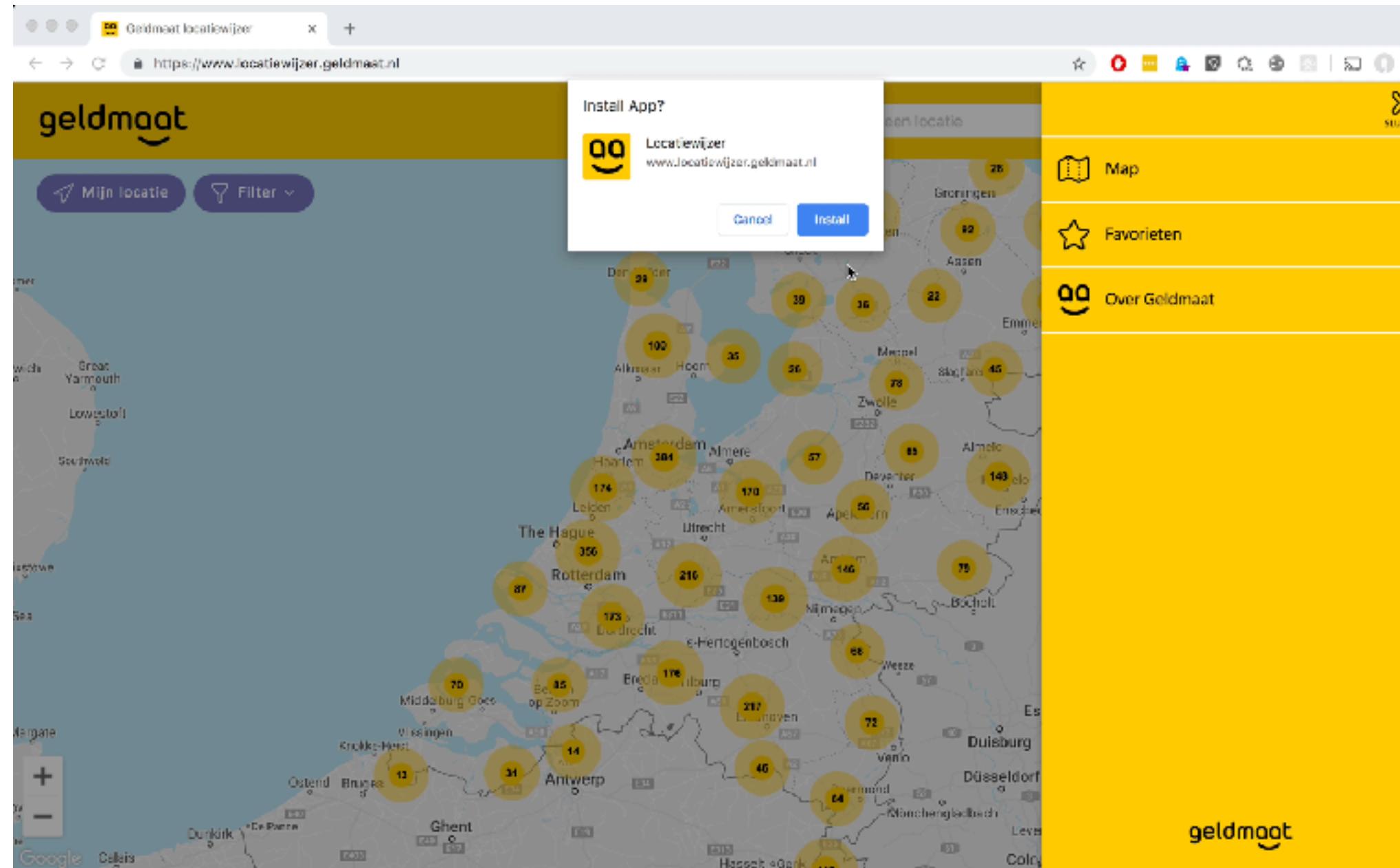




```
let installEvent;

window.addEventListener('beforeinstallprompt', event => {
  event.preventDefault();
  installEvent = event;
  customInstallButton.hidden = false;
});

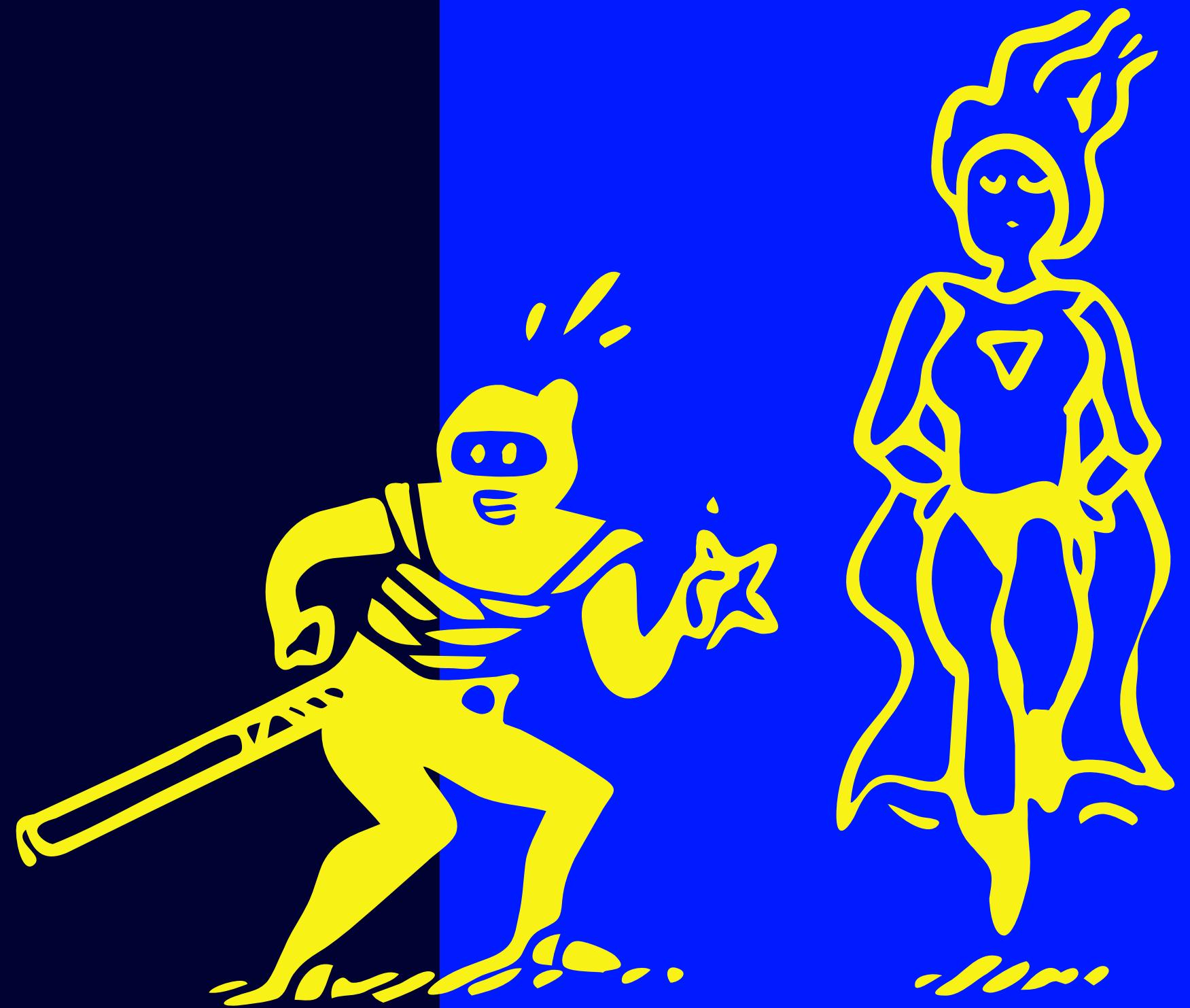
customInstallButton.addEventListener('click', () => {
  installEvent.prompt();
  installEvent.userChoice.then(choice => /*...*/);
});
```





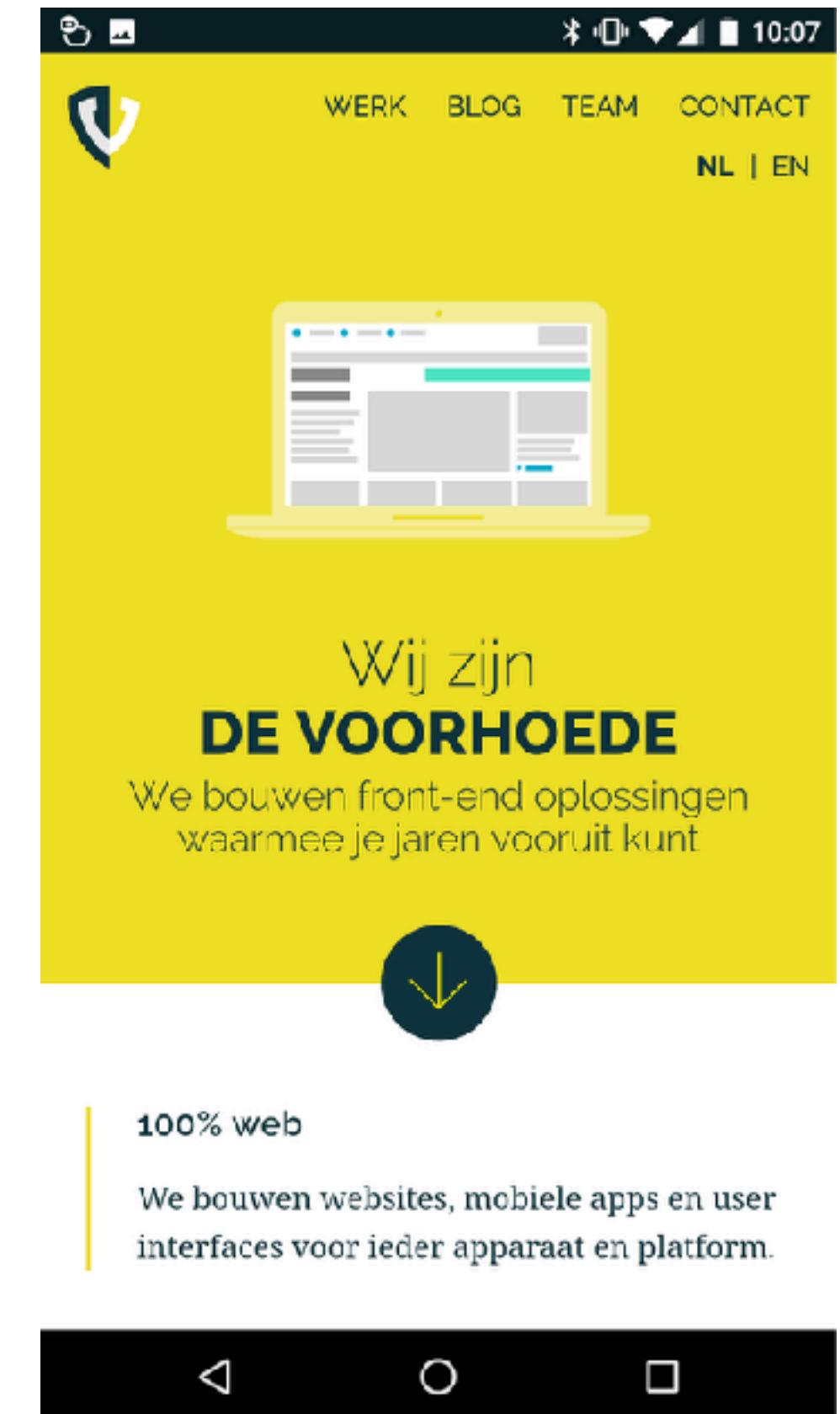
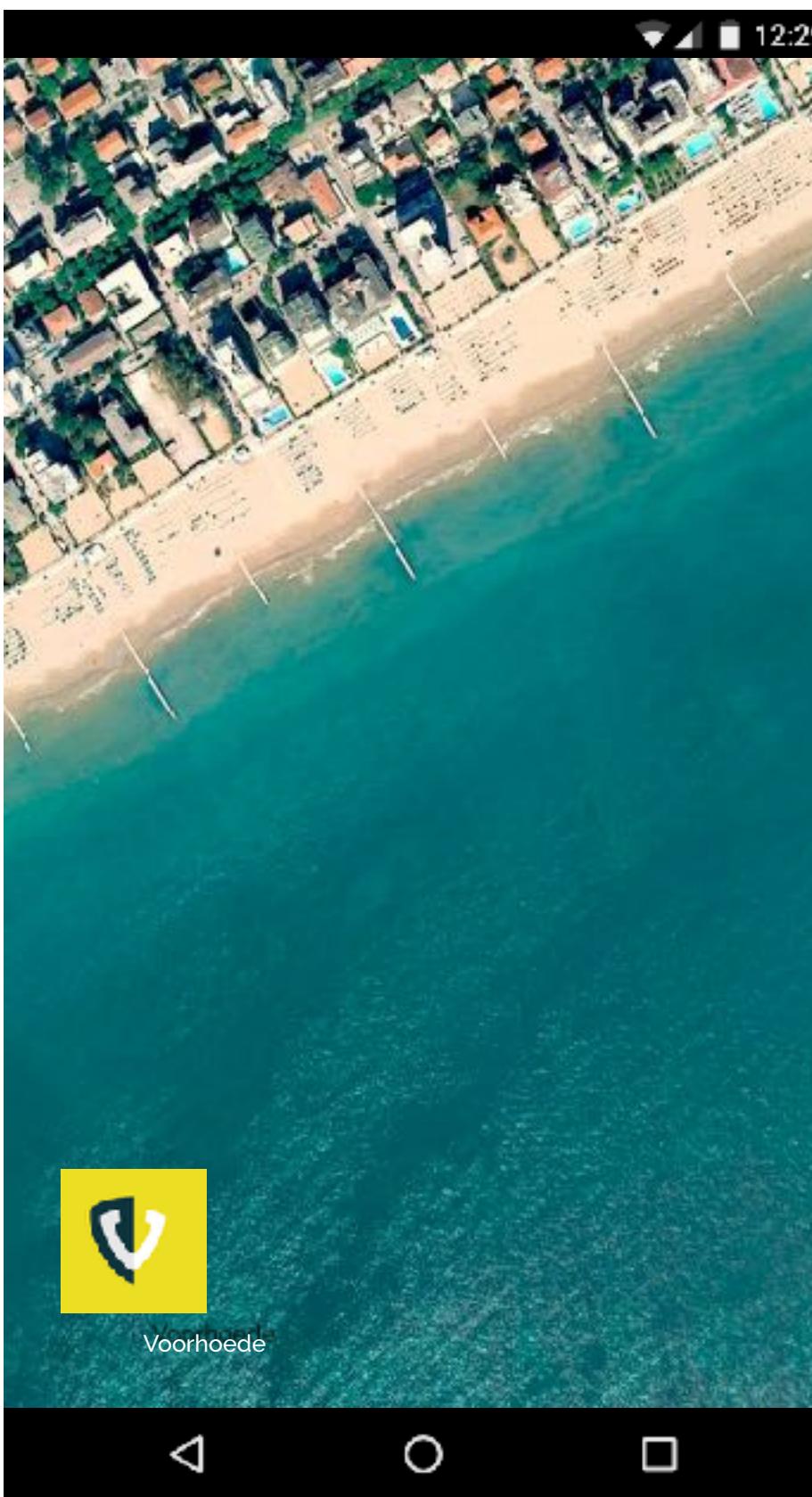
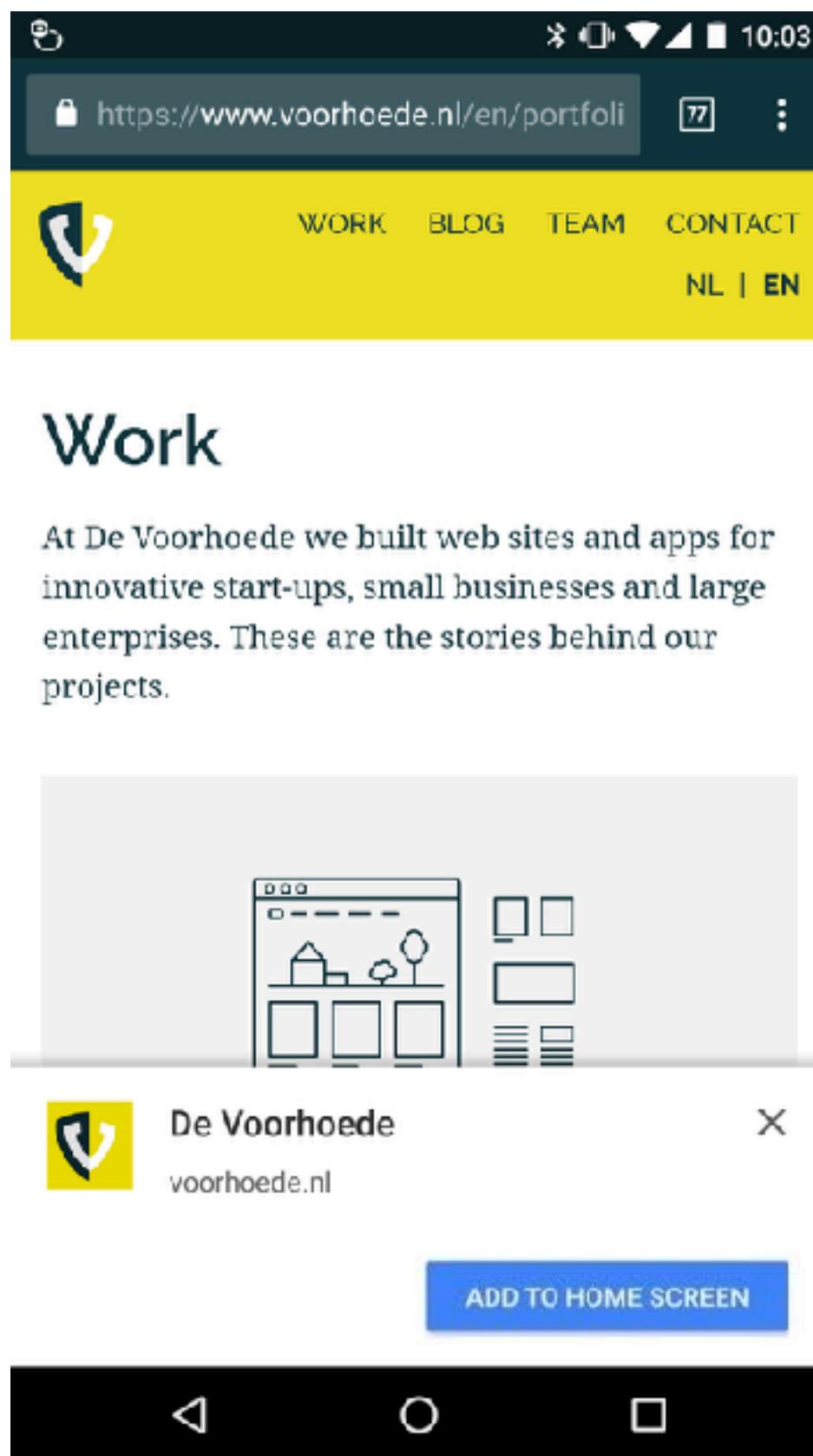
PWA ❤️ 💔 #3

splash on iOS





Startup on Android





Startup on Android

```
<title>Pick Up 10 challenge</title>
<link href="/favicon.ico" rel="icon" type="image/x-icon">
<meta name="theme-color" content="#49B9CD">
<link rel="manifest" href="/manifest.json">
```

```
{
  "name": "Pick Up 10",
  "start_url": "/get-ready/?standalone=true",
  "display": "standalone",
  "background_color": "#49B9CD",
  "theme_color": "#F26F69",
  "icons": [
    {
      "src": "/icon-1024.png",
      "sizes": "1024x1024",
      "type": "image/png"
    }
  ]
}
```



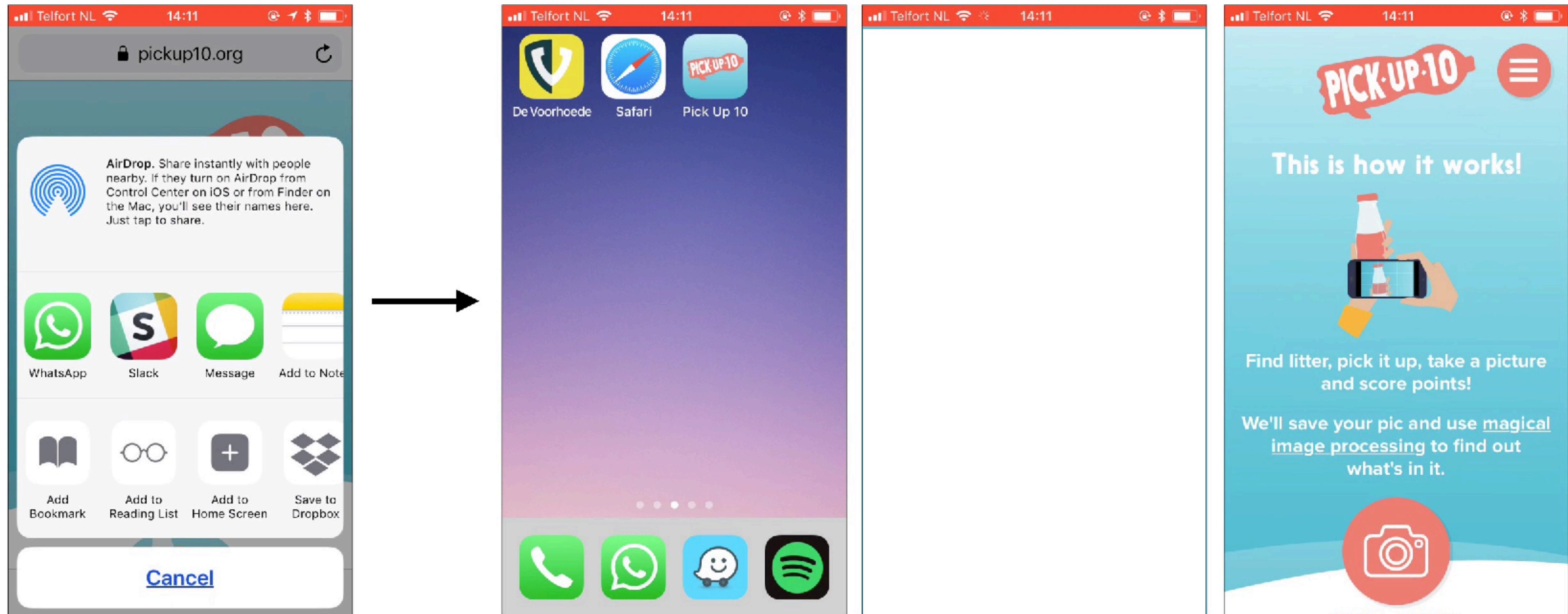
Startup on iOS

```
<title>Pick Up 10 challenge</title>
<link href="/favicon.ico" rel="icon" type="image/x-icon">

<meta name="mobile-web-app-capable" content="yes">
<meta name="apple-mobile-web-app-capable" content="yes">
<meta name="apple-mobile-web-app-status-bar-style" content="default">
<meta name="apple-mobile-web-app-title" content="Pick Up 10">
```



Startup on iOS



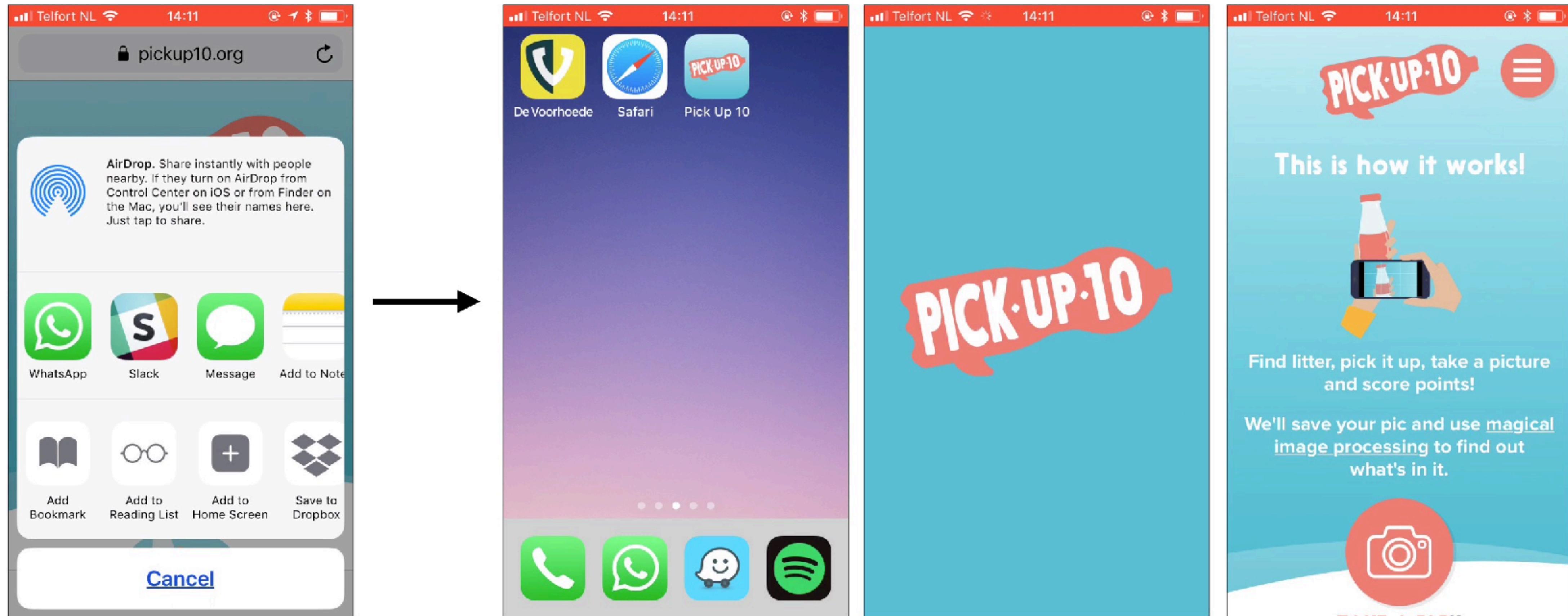


Startup on iOS

```
<link rel="apple-touch-startup-image" href="/ios-launch-1125x2436.png"
  media="(device-width: 375px) and (device-height: 812px) and (-webkit-device-pixel-ratio: 3)">
<link rel="apple-touch-startup-image" href="/ios-launch-750x1334.png"
  media="(device-width: 375px) and (device-height: 667px) and (-webkit-device-pixel-ratio: 2)">
<link rel="apple-touch-startup-image" href="/ios-launch-640x1136.png"
  media="(device-width: 320px) and (device-height: 568px) and (-webkit-device-pixel-ratio: 2)">
<link rel="apple-touch-startup-image" href="/ios-launch-1242x2208.png"
  media="(device-width: 414px) and (device-height: 736px) and (-webkit-device-pixel-ratio: 3)">
<link rel="apple-touch-startup-image" href="/ios-launch-1536x2048.png"
  media="(device-width: 768px) and (device-height: 1024px) and (-webkit-device-pixel-ratio: 2)">
<link rel="apple-touch-startup-image" href="/ios-launch-1668x2224.png"
  media="(device-width: 834px) and (device-height: 1112px) and (-webkit-device-pixel-ratio: 2)">
<link rel="apple-touch-startup-image" href="/ios-launch-2048x2732.png"
  media="(device-width: 1024px) and (device-height: 1366px) and (-webkit-device-pixel-ratio: 2)">
```



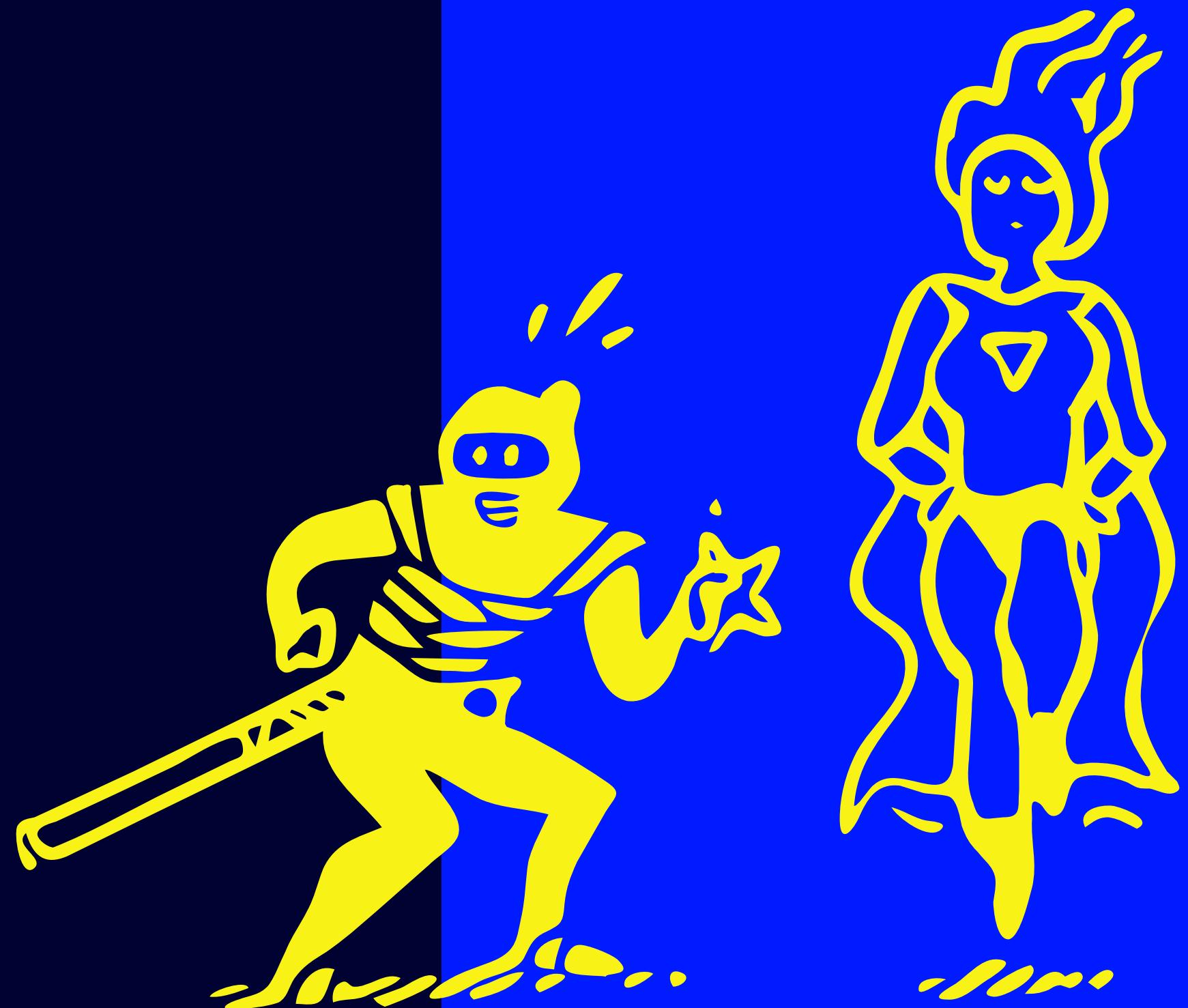
Startup on iOS

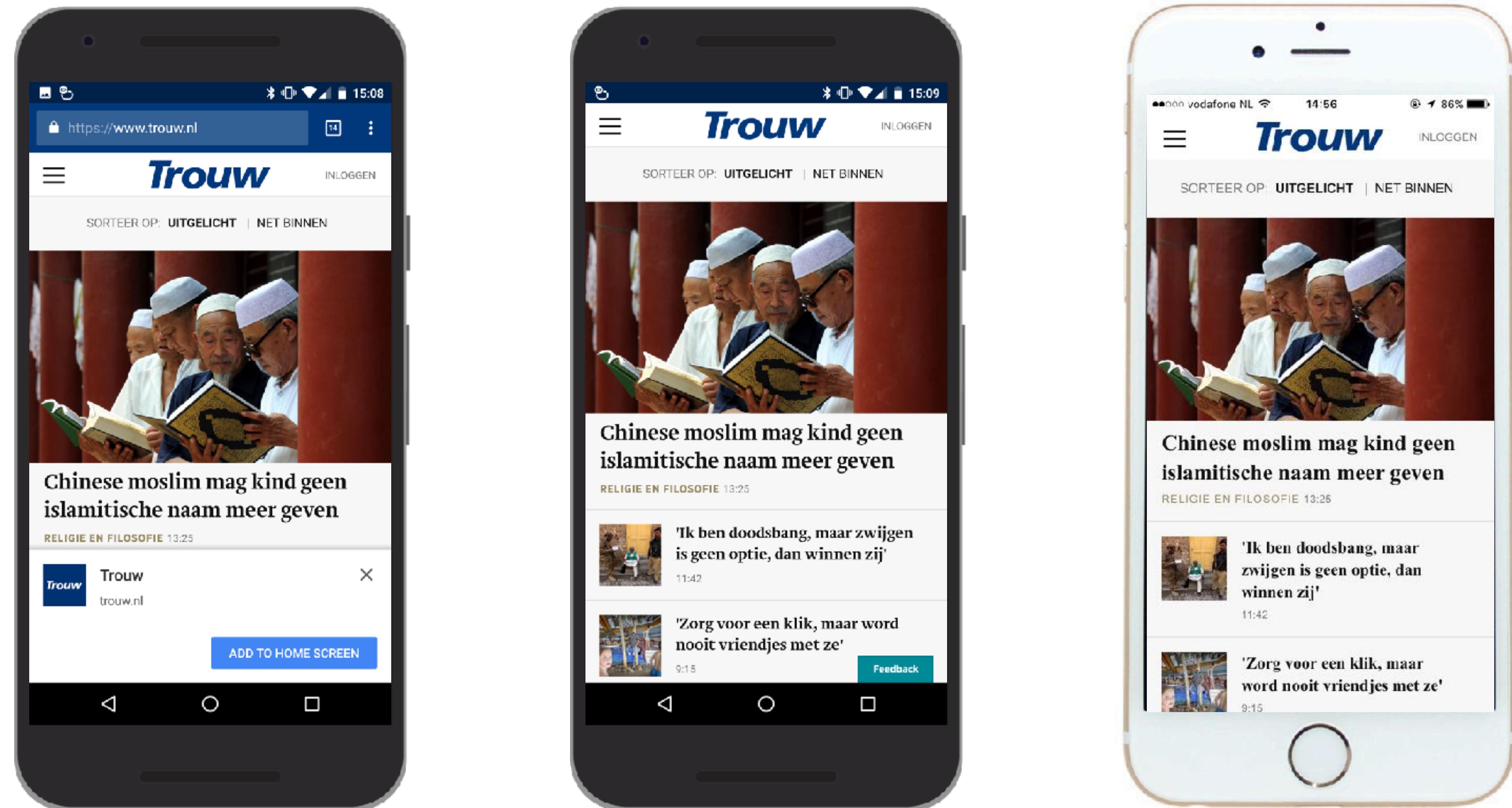




PWA ❤️💔 #4

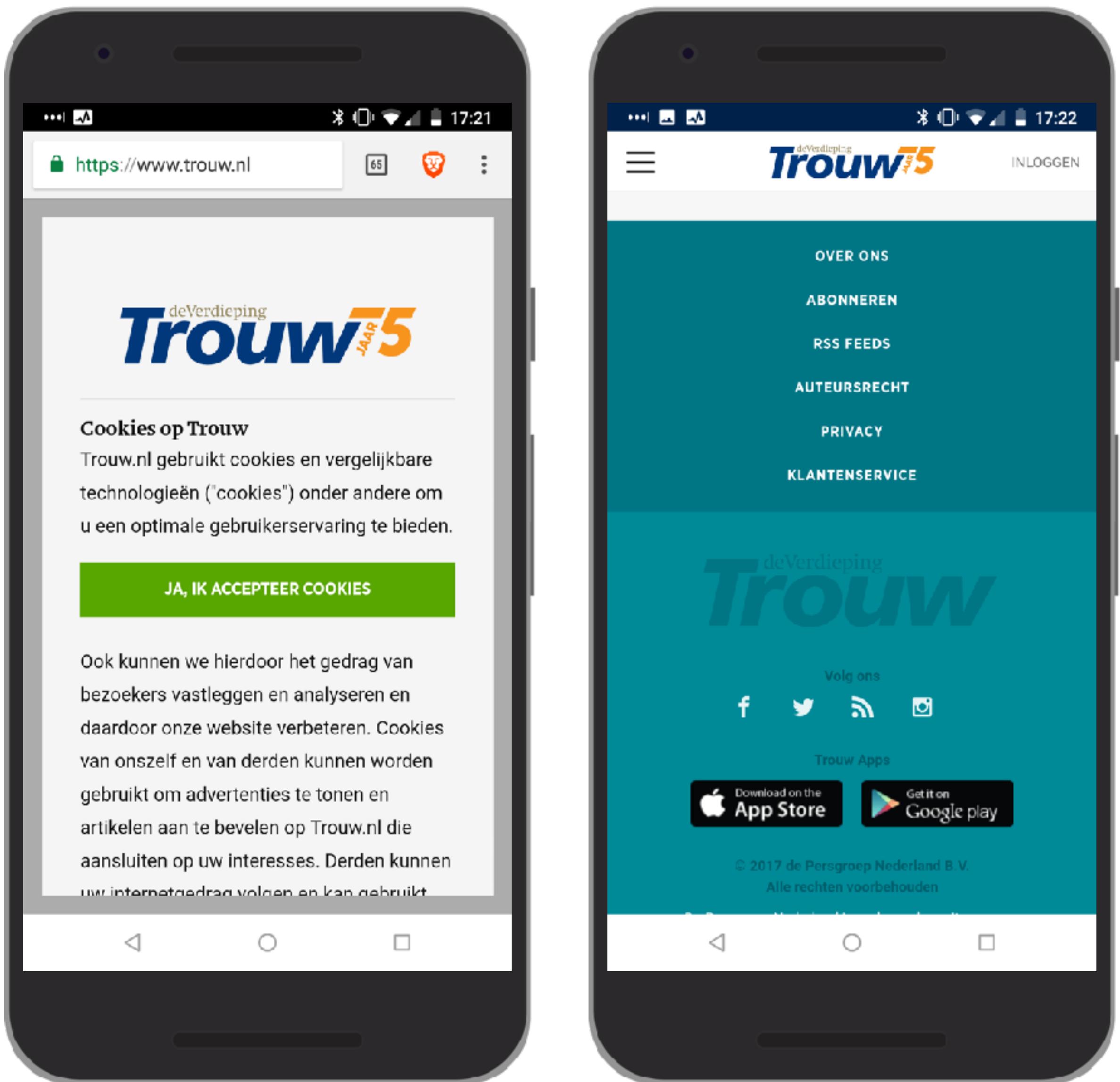
web vs app context





left-to-right: web, Android app, iOS app

read voorhoede.nl/nl/portfolio/trouw-volkskrant-parool/



Context matters

- interstitials
(cookie walls,
ads, ...)
- fat footers
- app banners
- 3rd party pop-ups



```
{  
  "short_name": "Trouw",  
  "name": "Trouw De Verdieping",  
  "start_url": "/?home=true",  
  "display": "standalone",  
  "orientation": "portrait",  
  "theme_color": "#00387B",  
  "background_color": "#00387B",  
  "icons": [  
    {  
      "src": "trouw-icon.png",  
      "sizes": "512x512",  
      "type": "image/png"  
    }  
  ],  
  "gcm_sender_id": "482941778795"  
}
```

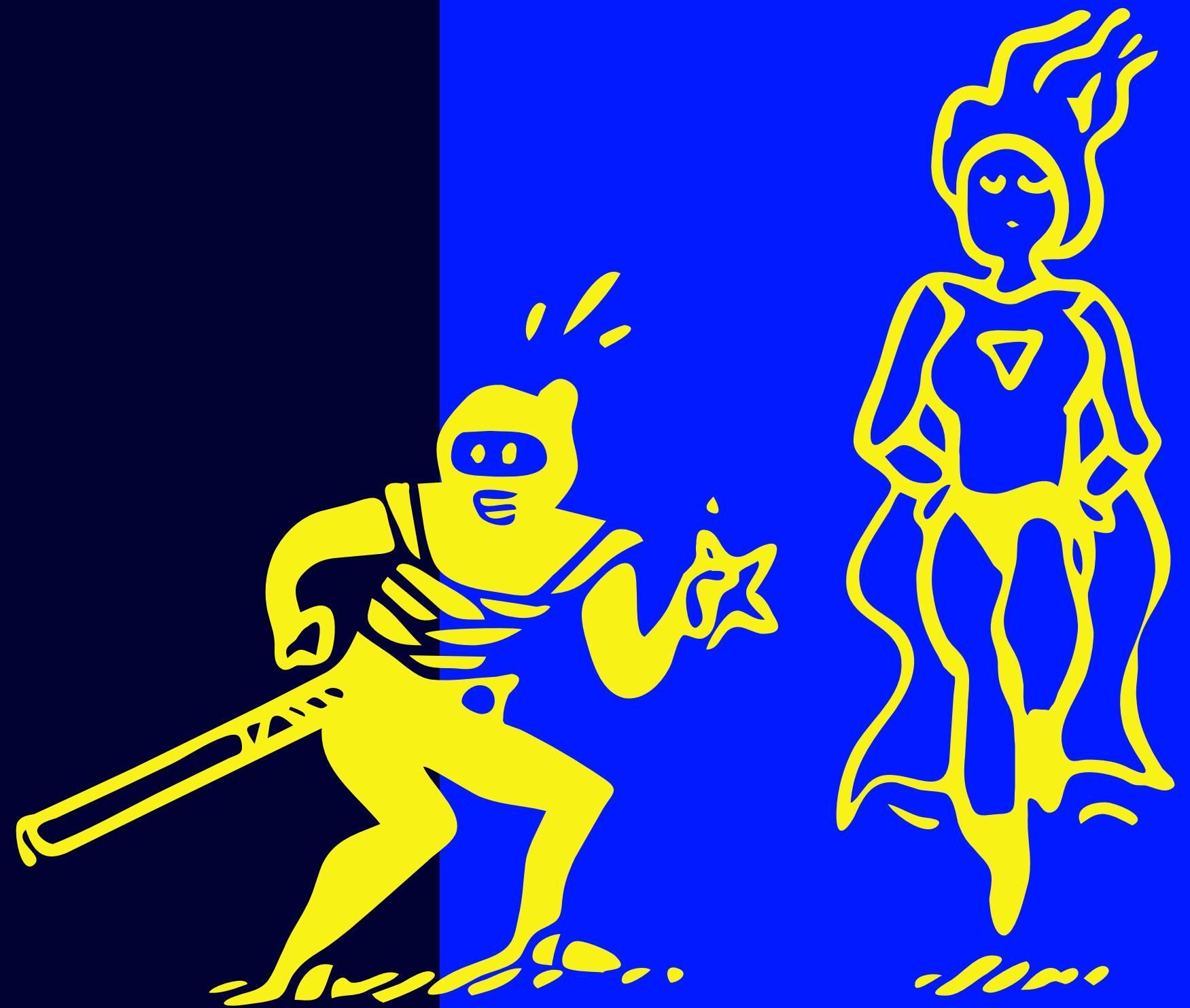
```
/* on Chromium browsers */  
@media (display-mode: fullscreen) {  
}  
  
/* or */  
@media (display-mode: standalone) {  
}  
  
// on iOS Safari  
if(navigator.standalone == true) {  
  // My app is installed and therefore fullscreen  
}
```

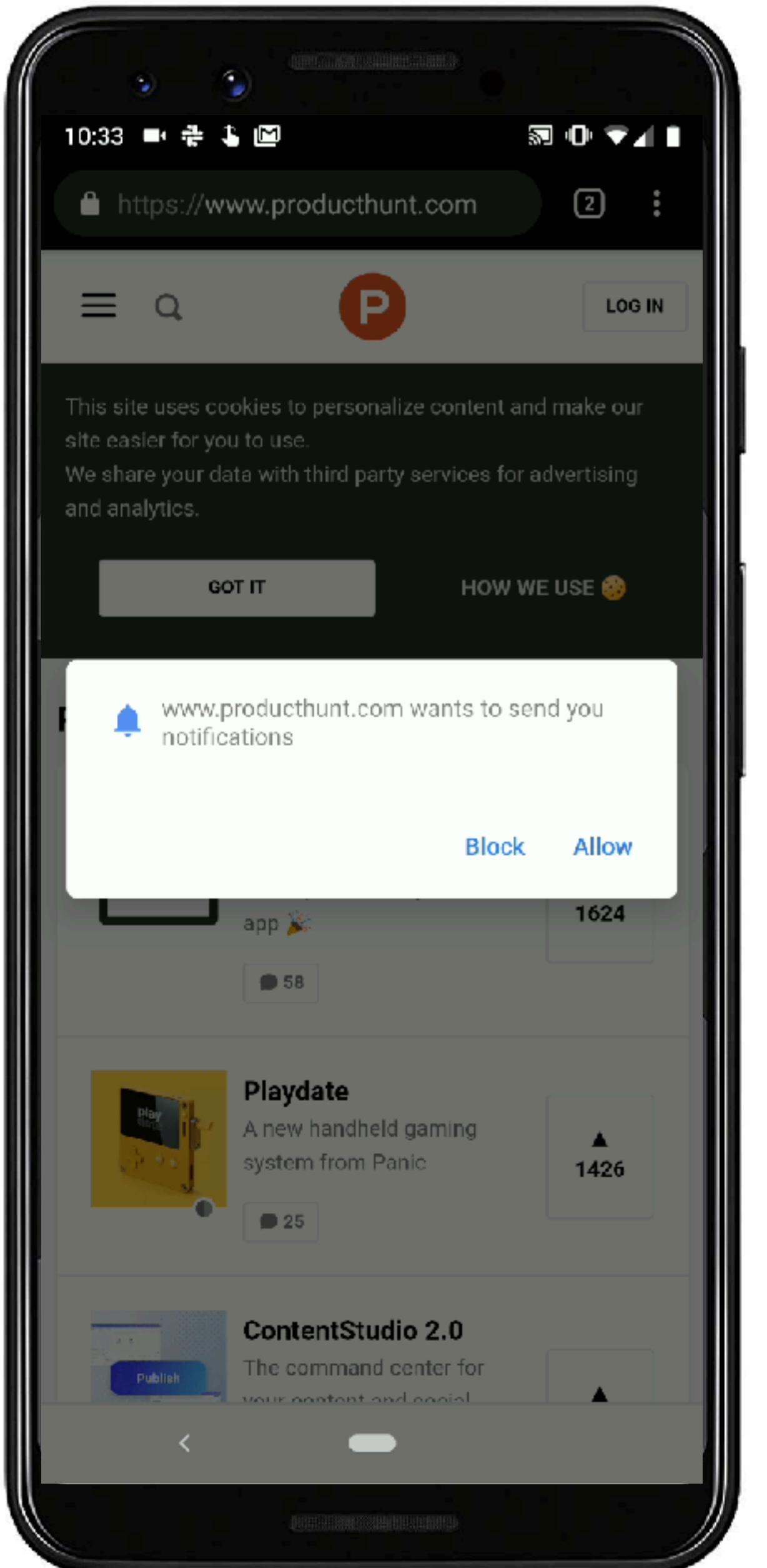
developers.google.com/web/fundamentals/native-hardware/fullscreen/



PWA ❤️💔 #5

don't be
too pushy





too pushy means
blocked forever





A screenshot of a desktop browser window. The address bar shows a secure connection to <https://www.voorhoede.nl/en/blog/instant-static-web-pages-with-service-worker/>. A modal dialog box is overlaid on the page, asking "www.voorhoede.nl wants to show notifications". It has two buttons: "Block" and "Allow", with "Allow" being highlighted with a circular selection. The main content of the page discusses "site implosion with Brotli and Gzip" and includes a "Receive our blog updates" section with "Turn notifications off" and "RSS Feed" buttons.

[voorhoede.nl/en/blog/making-our-site-more-app-y/](https://www.voorhoede.nl/en/blog/making-our-site-more-app-y/)

A screenshot of a mobile phone's screen. At the top, there are standard Android status icons. Below them, a text message reads: "Automatically create distributions and deploy them to GitHub Pages using Travis CI." Further down, another message says: "Go ahead and give them a taste. I hope they cure your fatigue and help you enjoy the latest the web has on the menu :)"

On the right side of the screen, there is a "Share on" section with icons for Facebook, Twitter, Google+, and LinkedIn. Below that, a "Continue reading:" link leads to "The importance of an Interaction Engineer". A note below it states: "If you're lucky, an Interaction Engineer is already part of your team— you just don't know it yet". At the bottom, there are links for "Back to blog overview", "Receive our blog updates" (with a green "Get notifications" button), and "RSS Feed".



```
// page.html
subscribeButton.addEventListener('click', () => {
  subscribeUser()
  hideSubscribeButtons()
  showUnsubscribeButtons()
}, false)

function subscribeUser() {
  OneSignal.push(() => {
    OneSignal.registerForPushNotifications()
    OneSignal.setSubscription(true)
  })
}
```

Automatically create distributions and deploy them to GitHub Pages using Travis CI.

Go ahead and give them a taste. I hope they cure your fatigue and help you enjoy the latest the web has on the menu ;)

Share on

f t g+ in

Continue reading:

The importance of an Interaction Engineer

If you're lucky, an Interaction Engineer is already part of your team—you just don't know it yet

[Back to blog overview](#)

Receive our blog updates

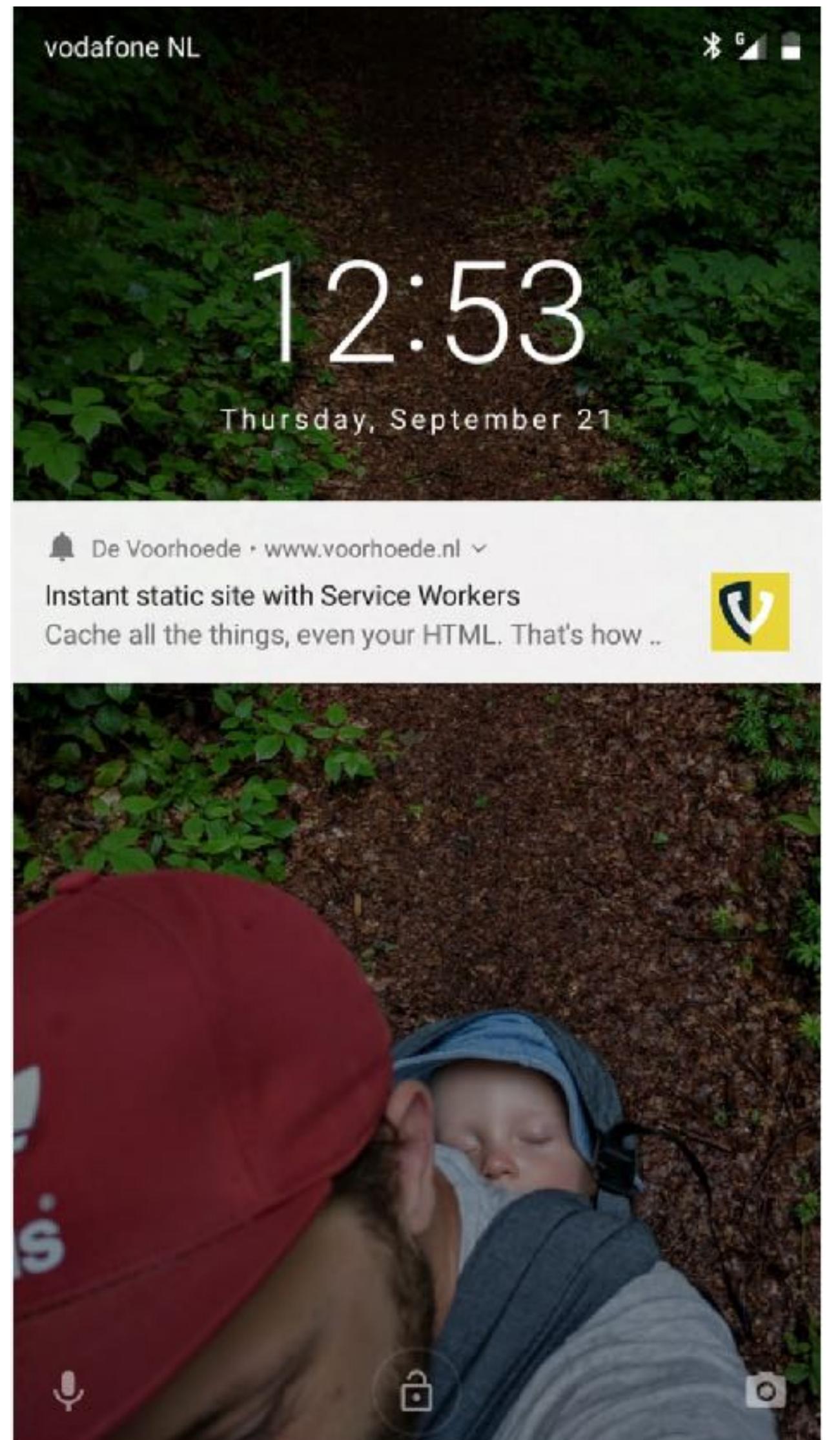
[Turn notifications off](#) [RSS Feed](#)

< O □



```
// page.html
subscribeButton.addEventListener('click', () => {
  subscribeUser()
  hideSubscribeButtons()
  showUnsubscribeButtons()
}, false)

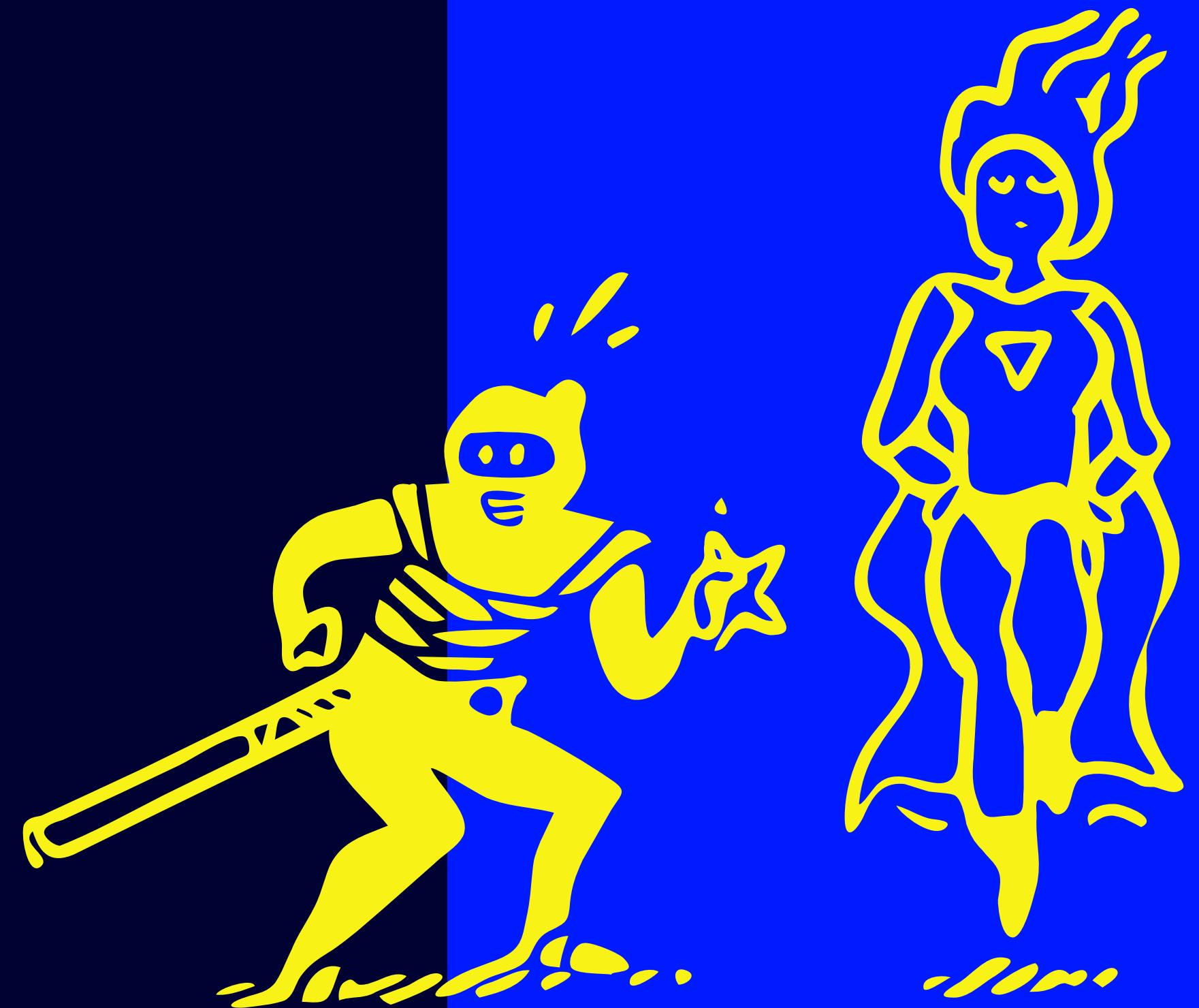
function subscribeUser() {
  OneSignal.push(() => {
    OneSignal.registerForPushNotifications()
    OneSignal.setSubscription(true)
  })
}
```

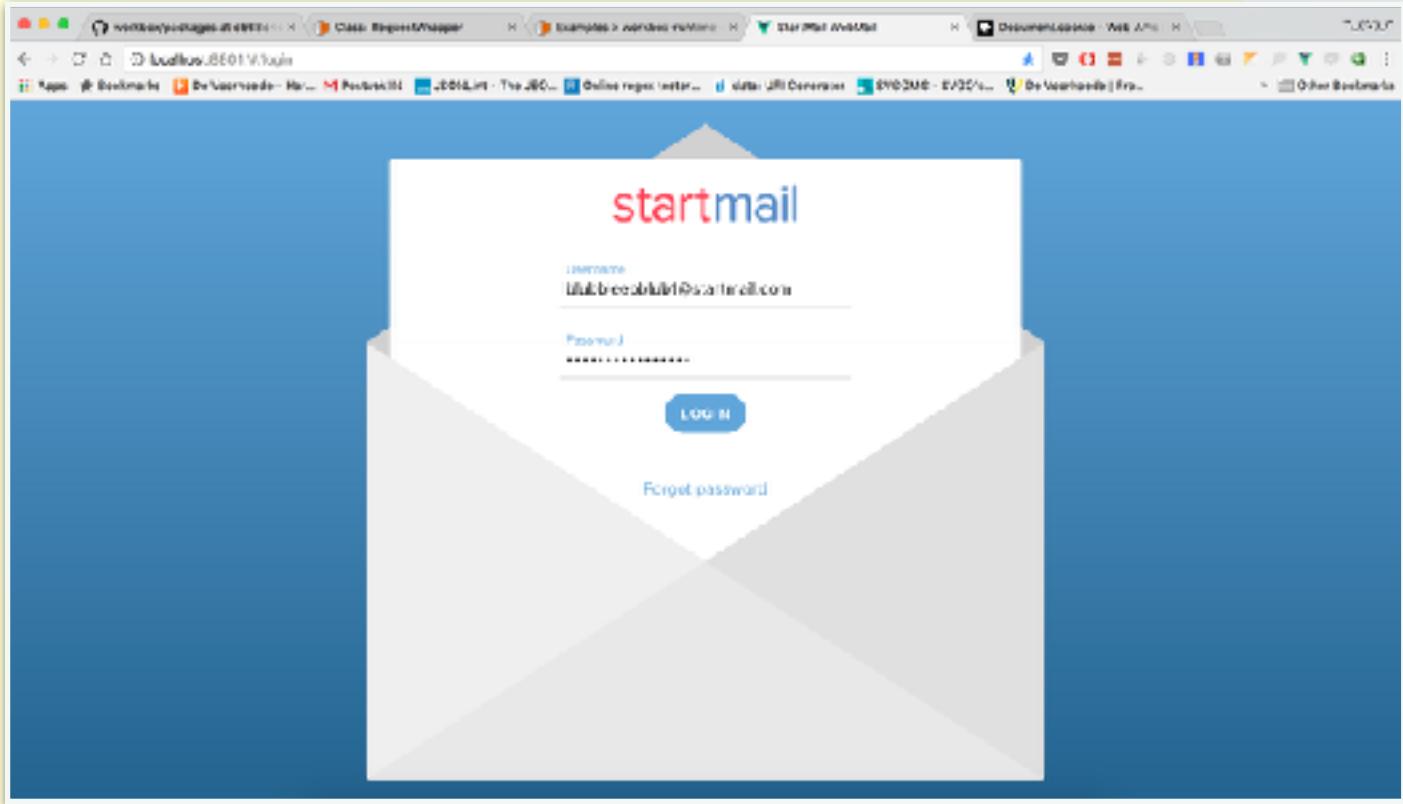




PWA ❤️💔 #6

storing private data offline





Subject	Sender	Date
Demo today	Tijn Schmits	Last Thursday
Fwd: [SECURITY] [DSA 3944-1] mariadb-10.0 security update	Tijn Schmits	Last Thursday
Fwd: [USN-3392-1] Linux kernel regression	Tijn Schmits	Last Wednesday
Hey, hoe gaat het ermee?	Tijn Schmits	Aug 07, 2017
Sprint Review Today	Tijn Schmits	Jul 27, 2017
HTML in a text message	Aaryn Tonita	Jul 13, 2017
blubleepblub1@startmail.com	Aaryn Tonita	Jul 12, 2017
Re: Reminder to self: Finish NFE	Tijn Schmits	Jun 19, 2017
Test selfsending 01	StartMail Test	Jun 16, 2017
Re: Testing	StartMail Test	Jun 09, 2017

StartMail Client

private & secure
email client
as a web app

Startpage.com
 StartMail



private data in public cache

The screenshot shows a browser developer tools interface with the "Application" tab selected. In the "Cache" section, there is a table listing three requests from the "messages" service. The table has columns for Request URL and Response status.

#	Request	Response
0	https://api.nylas.com/messages/6dapowlkmm39e2o63unwj1pe9	OK
1	https://api.nylas.com/messages/av3tjfm8xvmzzpaio9r2u0zzu	OK
2	https://api.nylas.com/messages?in=6tv1f6yil0pziavaddek7rsvs&limit=51&offs...	OK

In the "Frames" section, the "Console" tab is active, showing a JavaScript promise being resolved. The promise is triggered by a call to `caches.match` for a specific message URL. The resolved value is a JSON object containing account details and a body with HTML content.

```
> caches.match('https://api.nylas.com/messages/av3tjfm8xvmzzpaio9r2u0zzu')
  .then(response => response.json())
  .then(responseBody => console.log(responseBody))
< Promise {[[PromiseStatus]]: "pending", [[PromiseValue]]: undefined}
▶ {account_id: "dw8ulo7jflxelumie5wt8dalt", bcc: Array(0), body: "<p>Hi,</p><p>Good luck with the demo again today!</p><p>Kind regards,<br>Tijn</p>", cc: Array(0), date: 1502970512, ...}
```

VM1818:3

At the bottom, a footer link points to a GitHub presentation page.

github.com/decrek/presentations/blob/master/balancing-privacy-and-performance_front-end-forward_08-2017.pdf

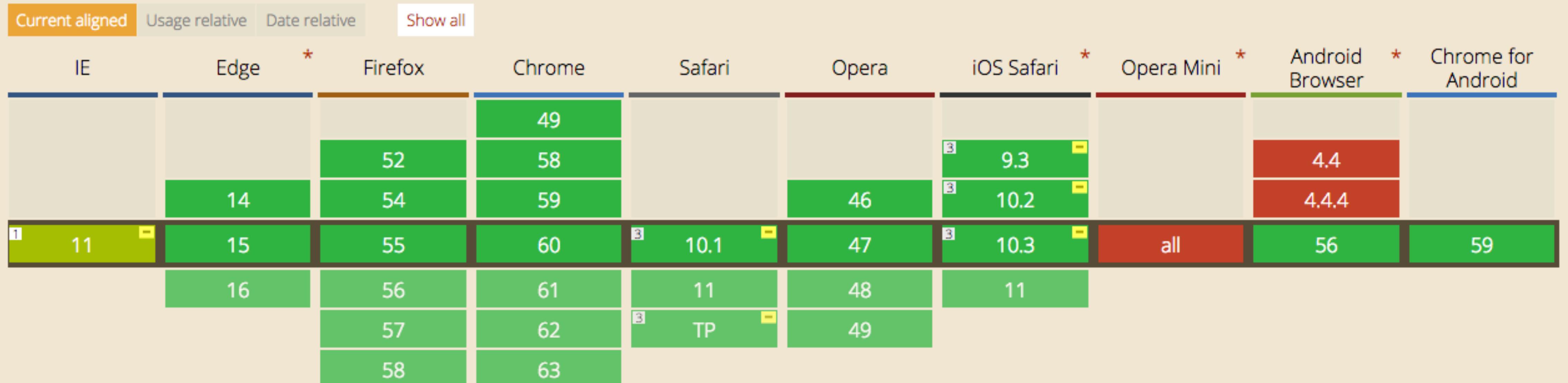


Web Cryptography

- CR

JavaScript API for performing basic cryptographic operations in web applications

Global	87.15% + 3.41% = 90.56%
unprefixed:	75.2%
Netherlands	86.99% + 7.22% = 94.21%
unprefixed:	61.75%



Notes

Known issues (0)

Resources (13)

Feedback

Many browsers support the `crypto.getRandomValues()` method, but not actual cryptography functionality under `crypto.subtle`.

Firefox also has support for unofficial features.



private data in public cache

The screenshot shows a web browser window with the title "StartMail WebMail". The address bar displays "localhost:8111/#/mailbox/ezt8jxw8jOhjdse3hxd75x2vu/419yumd5a39h4zc2bs5bzmtqt". The main content area shows an email from "Tijn Schmits" with subject "Hey, hoe gaat het ermee?". The message body contains a short text. To the right, the developer tools are open, specifically the Application tab. The Storage section lists Local Storage, Session Storage, IndexedDB, Web SQL, and Cookies. The Cache section shows "messages-cache - http://localhost:81" under Cache Storage. The Network tab displays four requests to "https://api.nylas.com/messages" with status OK. The Console tab shows JavaScript code for caching a response, and the Sources tab shows a partially visible JSON object with fields like cipher_text, salt, and iv.

StartMail WebMail

localhost:8111/#/mailbox/ezt8jxw8jOhjdse3hxd75x2vu/419yumd5a39h4zc2bs5bzmtqt

Tijn Schmits ②

Hey, hoe gaat het ermee?

To: From: blubblepblub1@startmail.com tijn@startmail.com

Aug 07, 2017

Hai Blub,
Nu al een tijdje bij ons bezig... hoe gaat het
ermee?
Groet,
Tijn

Elements Console Sources Network Performance Memory Application Security Audits

Storage

- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies

Cache

- Cache Storage
 - messages-cache - http://localhost:81
- Application Cache

#	Request	Response
0	https://api.nylas.com/messages/419yumd5a39h4zc2bs5bz... https://api.nylas.com/messages/6d1rhqa5ndp8iqnrw5itzeq4c https://api.nylas.com/messages/av3tjfm8xvmzzpaio9r2u0zzu https://api.nylas.com/messages?in=ezt8jxw8jOhjdse3hxd75x...	OK
1		
2		
3		

Console What's New

top Filter Default levels

```
Registration succeeded. (index):7
> caches.match('https://api.nylas.com/messages/419yumd5a39h4zc2bs5bzmtqt')
  .then(response => response.json())
  .then(responseBody => console.log(responseBody))
< ▶ Promise {[[PromiseStatus]]: "pending", [[PromiseValue]]: undefined}

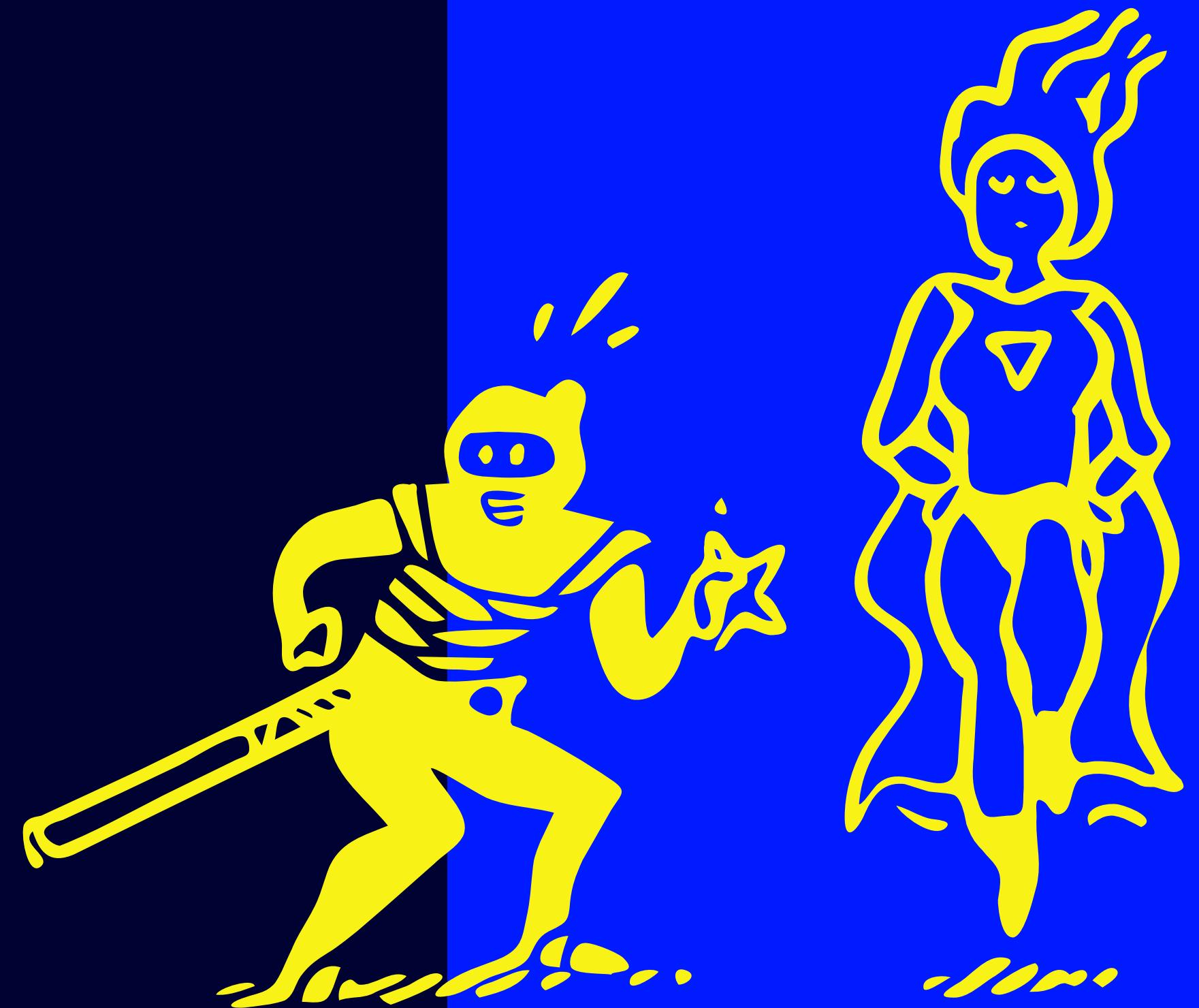
  cipher_text: "k+Y1KWWGZ1m1ug08dJYNQuYBzIjVfc9azG1ws8s0gpFBXqhiIs...tN+uIxHMV7XzkKhyZy+Pjx1SrN0kthP9GH+ca24Fl7jLLnw==", salt: "Hsskkcs4zyA/Jjg4k+lmuc"
  cipher_text: "k+Y1KWWGZ1m1ug08dJYNQuYBzIjVfc9azG1ws8s0gpFBXqhiIsmva28U9MYnSEHImg7wcvJez2pnnkSNw/qoEhSKgvy0v40kp7W3Eg3s7rDXsheBcABELKIR+YdvyYA3AIi0
  iv: "e/xl0VNsnfu9Eh+ADPNaNQ=="
  salt: "Hsskkcs4zyA/Jjg4k+lmuch7RAJV6Ac0uN18nHeWvkXp6PVUgQJpfRLRuQ4VFSVglaEY+Yq0rTl4PoNdwMwzbeV63ZC5N9St/ZBPC1PuD5aSf8aumc0JGcUPiriF7KP3rxVjlL
  > __proto__: Object
```

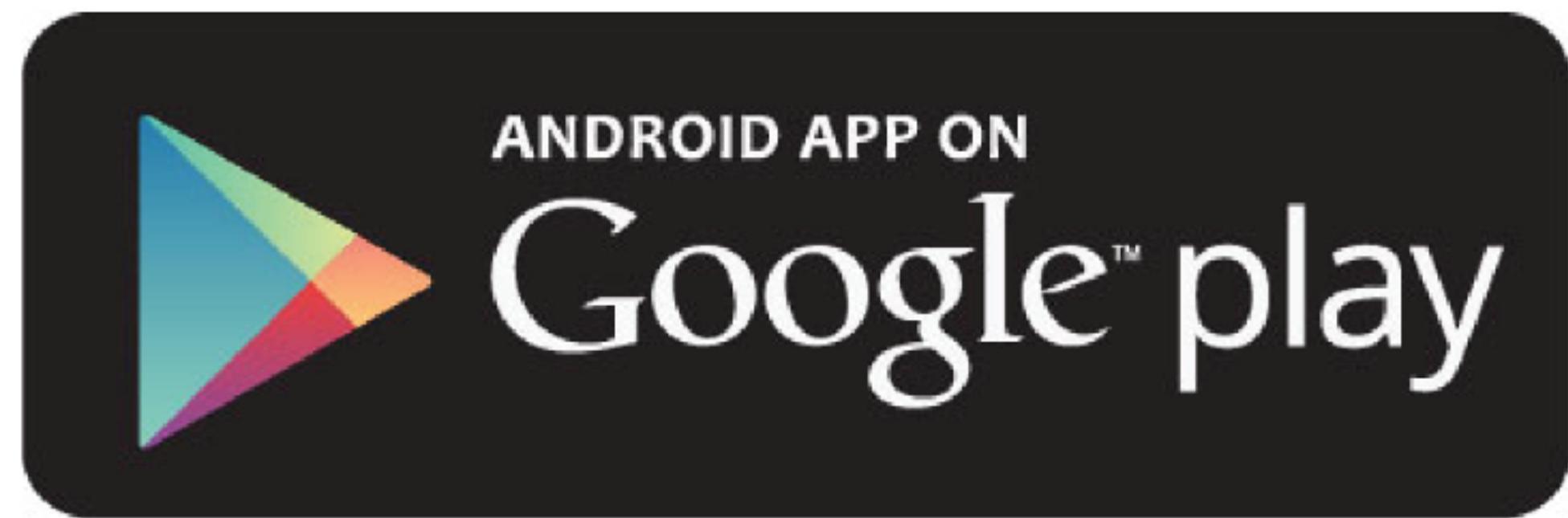
VM52:3



PWA ❤️💔 #7

clients still want
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presence







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Parent Guide

PICK UP 10

Pick Up 10

De Voorhoeve Lifestyle

PEGI 3

This app is compatible with your device.

Installed

Earn points after it automatically gets identified

WATER BOTTLE

TAKE A PIC OF LITTER

THE MAGIC HAPPENS: WE IDENTIFY WHAT'S IN THE PICTURE

WE USE YOUR PICTURE TO CONFRONT COMPANIES WITH THEIR LITTER

CONTINUE CHALLENGE

Take a pic of litter

SHARE WITH

Take a pic of litter

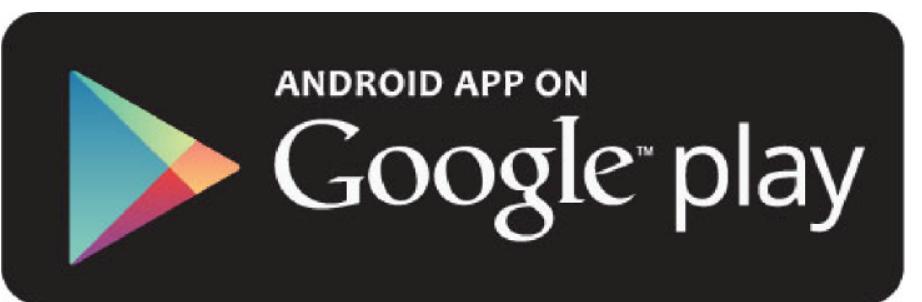
TAKE A PIC

Earn bonus points with:

- PLASTIC FANTASTIC
- BRANDED & BUSTED
- LURK
- TEAM UP
- PICK UP 10 (M1)

SHARE WITH

Join the club





The screenshot shows the Android Studio interface with the project 'svgomg-twa' open. The left sidebar displays the project structure, and the main editor shows the contents of the 'build.gradle' file. The file defines a plugin application with a specific manifest configuration for a TWA.

```
/*
 * Copyright 2019 Google Inc.
 *
 * Licensed under the Apache License, Version 2.0 (the "License");
 * you may not use this file except in compliance with the License.
 * You may obtain a copy of the License at
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 *     http://www.apache.org/licenses/LICENSE-2.0
 *
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 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */

apply plugin: 'com.android.application'

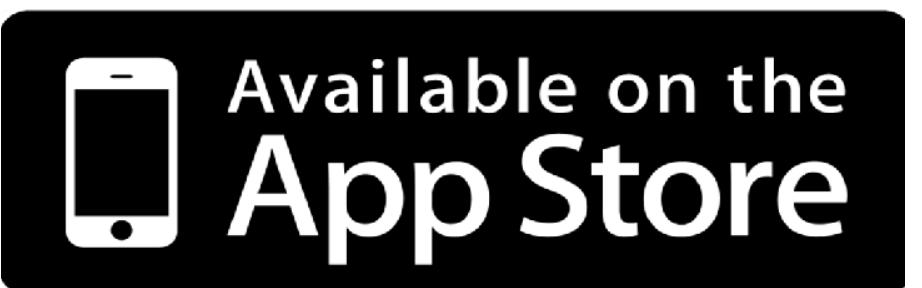
def twaManifest = [
    applicationId: 'com.voorhoede.pickup10',
    hostName: 'pickup10.org', // The domain being opened in the TWA.
    launchUrl: '/', // The start path for the TWA. Must be relative to the domain.
    name: 'Pick Up 10', // The name shown on the Android Launcher.
    themeColor: '#F26F69', // The color used for the status bar.
    backgroundColor: '#49B9CD' // The color used for the splash screen background.
]

android{}
```



```
export default class App extends React.Component {
  onNavigationStateChange = (event) => {
    if (!isInternalUrl(event.url)) {
      this.webview.stopLoading()
      WebBrowser.openBrowserAsync(event.url)
    }
  }

  render() {
    return (
      <View>
        <StatusBar barStyle="light-content" />
        <SafeAreaView forceInset={{ bottom: 'never' }} style={{ flex: 1, backgroundColor: '#49B9CD' }}>
          <WebView ref={webview => (this.webview = webview)} source={{ uri: webViewUrl }} onNavigationStateChange={this.onNavigationStateChange}>
            />
          </SafeAreaView>
        </View>
      )
    }
  }
}
```





The screenshot shows a modal dialog box titled "Generate AppX". At the top left is a close button (an "X"). At the top center is the title "Generate AppX". Below the title is a sub-instruction: "Enter your [Dev Center](#) details below in order to generate an AppX package you can upload to the store." At the bottom of the dialog are two buttons: "Cancel" (teal) and "Submit" (purple).

Publisher Display Name

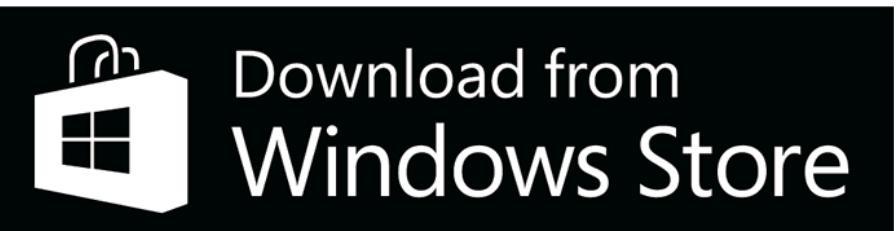
Enter a Name or Company Name

Publisher Identity

Found under Account Settings, Windows Publisher ID.

CN=

Package Identity Name





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PWA Pick Up 10 Application

Submission 1 Delete

A previous submission failed certification at April 10, 2019 12:07 PM (UTC). Please read the certification report(s) listed below and make all needed changes. If we removed your app from the Store and you want to update it to follow policy, [contact the certification team](#).

Certification reports

Date (JTC)	Result	Link
April 10, 2019 12:07 PM	Failed	View report

Pricing and availability

We can't show details for this section right now. Please refresh the page or try again later.

Properties

Lifestyle Complete ✓

Age ratings

E CSRB 3 PEGI L IARC 0+ 0+ 3 Complete ✓

Packages

windows.appx Validated Complete ✓

Store listings

Add/remove languages Export listings Import listings Complete ✓

Languages supported in packages English (United States) Complete

Submission options

Publish as soon as possible Recommended



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thanks

Jasper Moelker

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