



Designing for Everyone: Building Great Web Experiences for Any Device

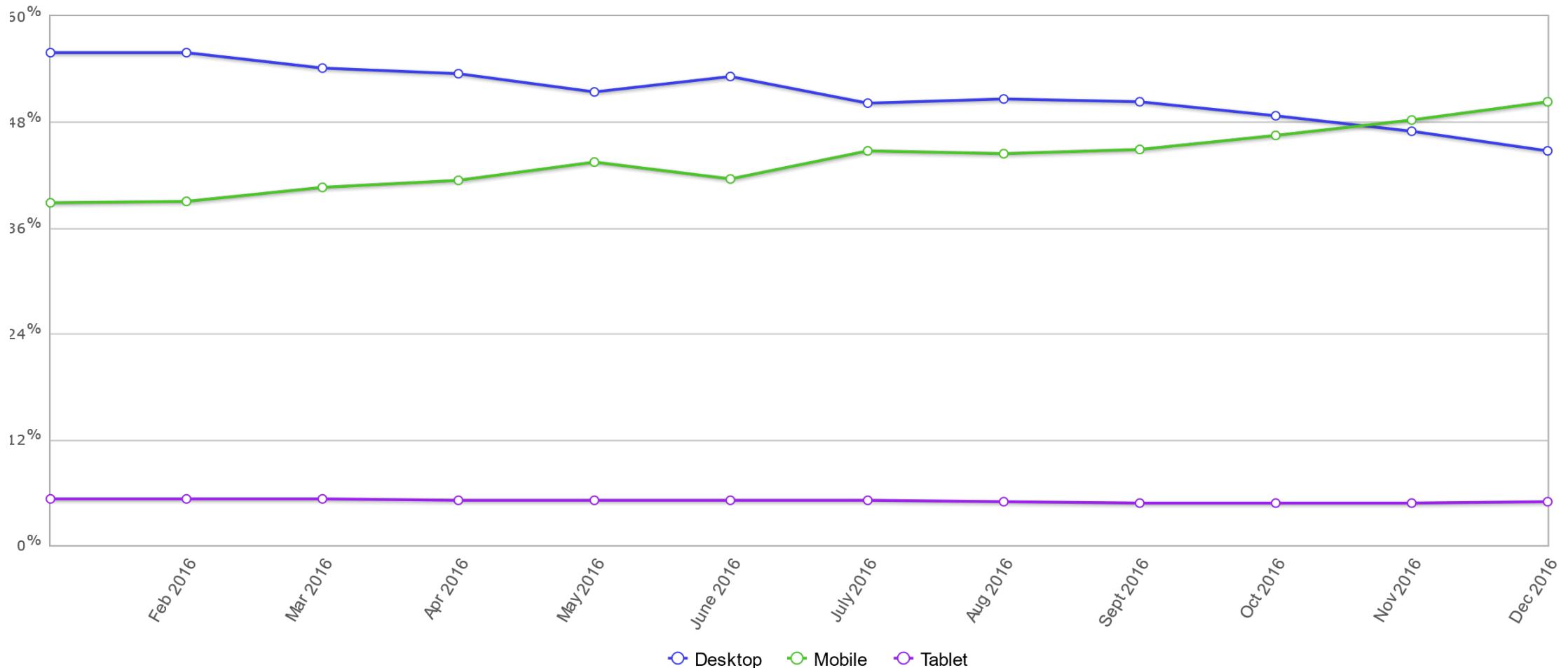
Aaron Gustafson

BRK2411

A large pile of various pumpkins and gourds in shades of orange, red, and green, filling the background of the slide.

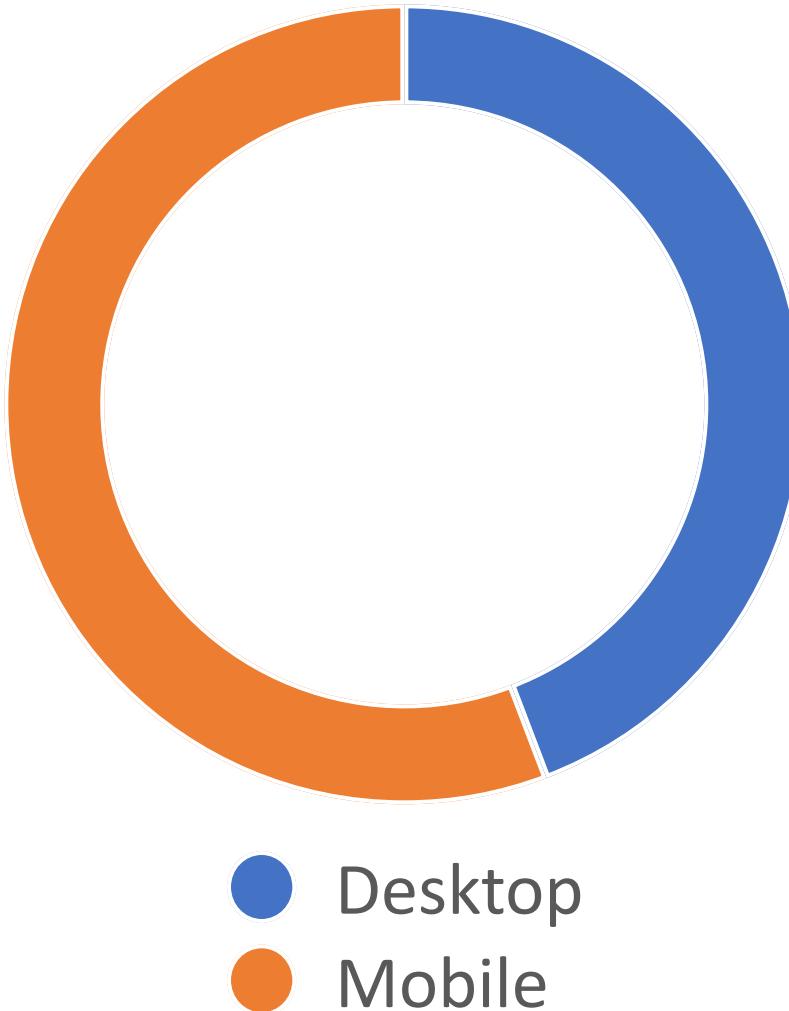
In October of 2016, mobile ate the desktop...

Mobile traffic overtakes desktop globally



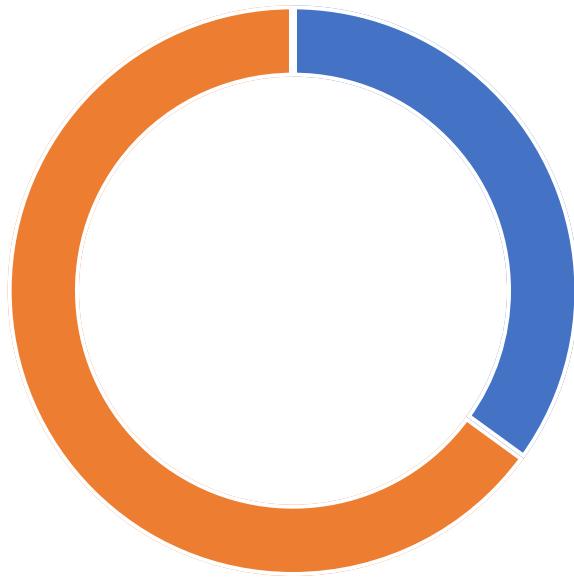
Mobile accounts for 56% of all traffic*

*Based on 77 billion website visits.

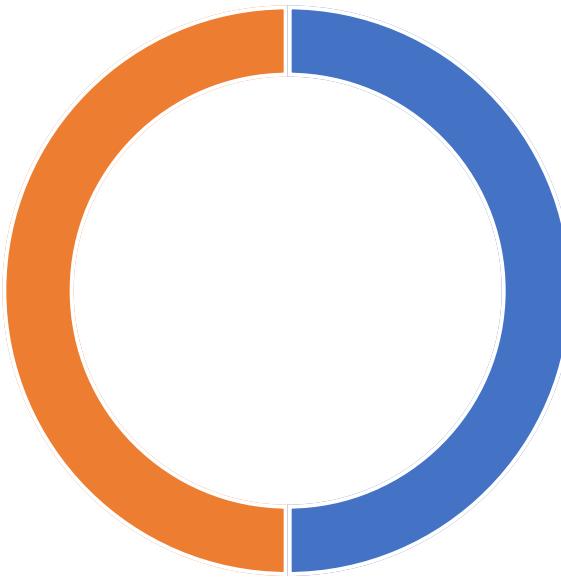


But the numbers differ by industry

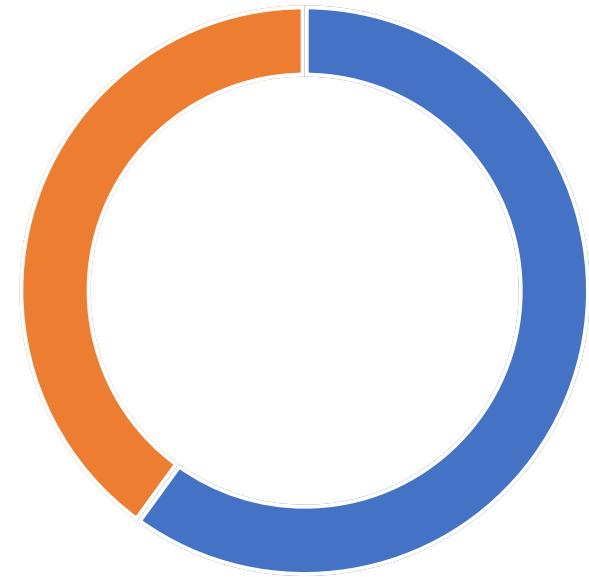
Food



News



Finance



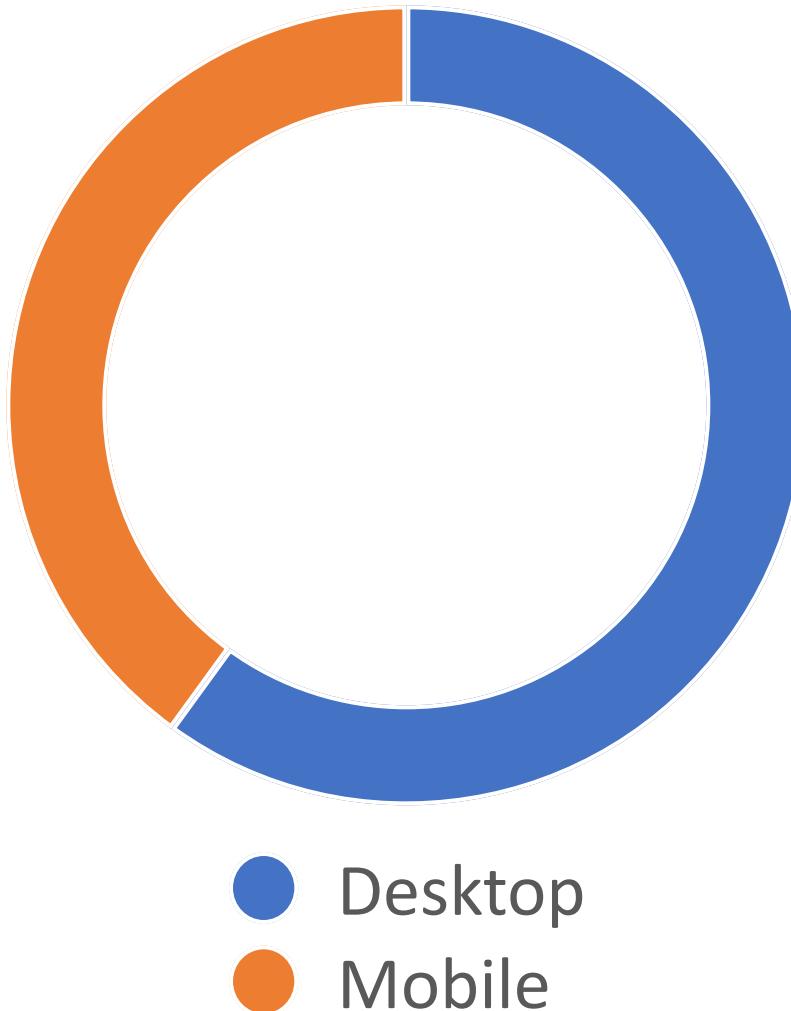
● Desktop ● Mobile

● Desktop ● Mobile

● Desktop ● Mobile

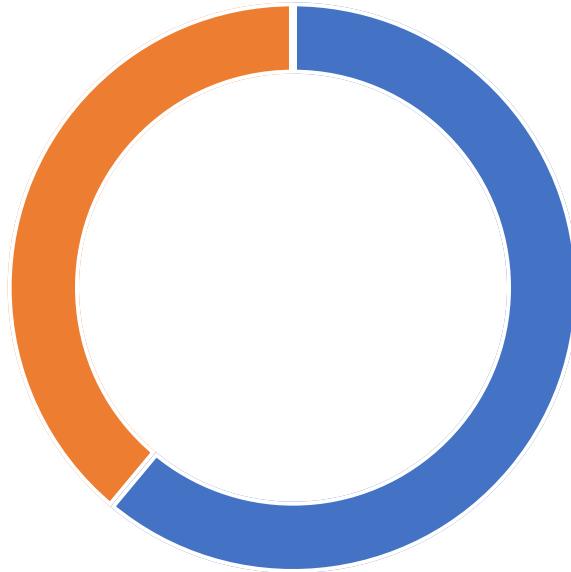
Desktop users spend more time on sites (60%)*

*Based on 39 trillion seconds.



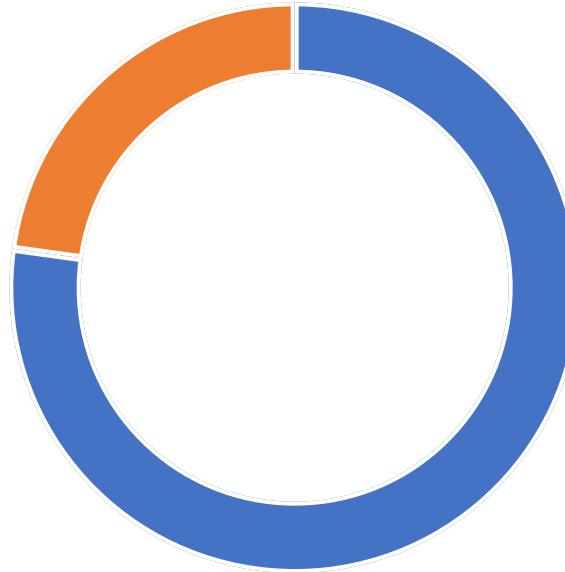
Anywhere from 10-300%

Food



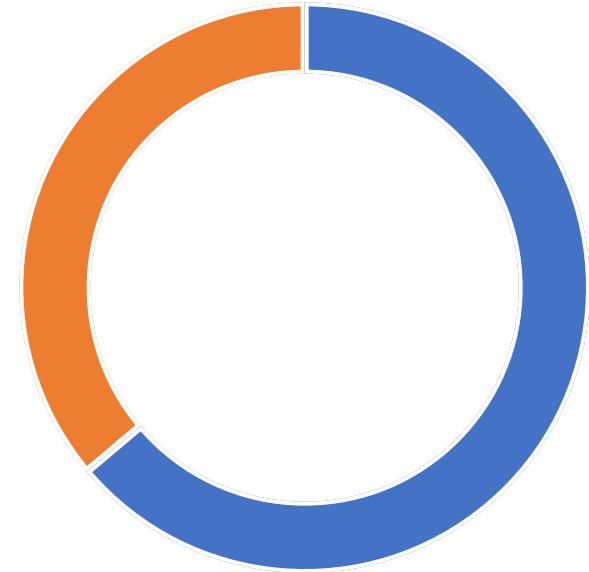
● Desktop ● Mobile

News



● Desktop ● Mobile

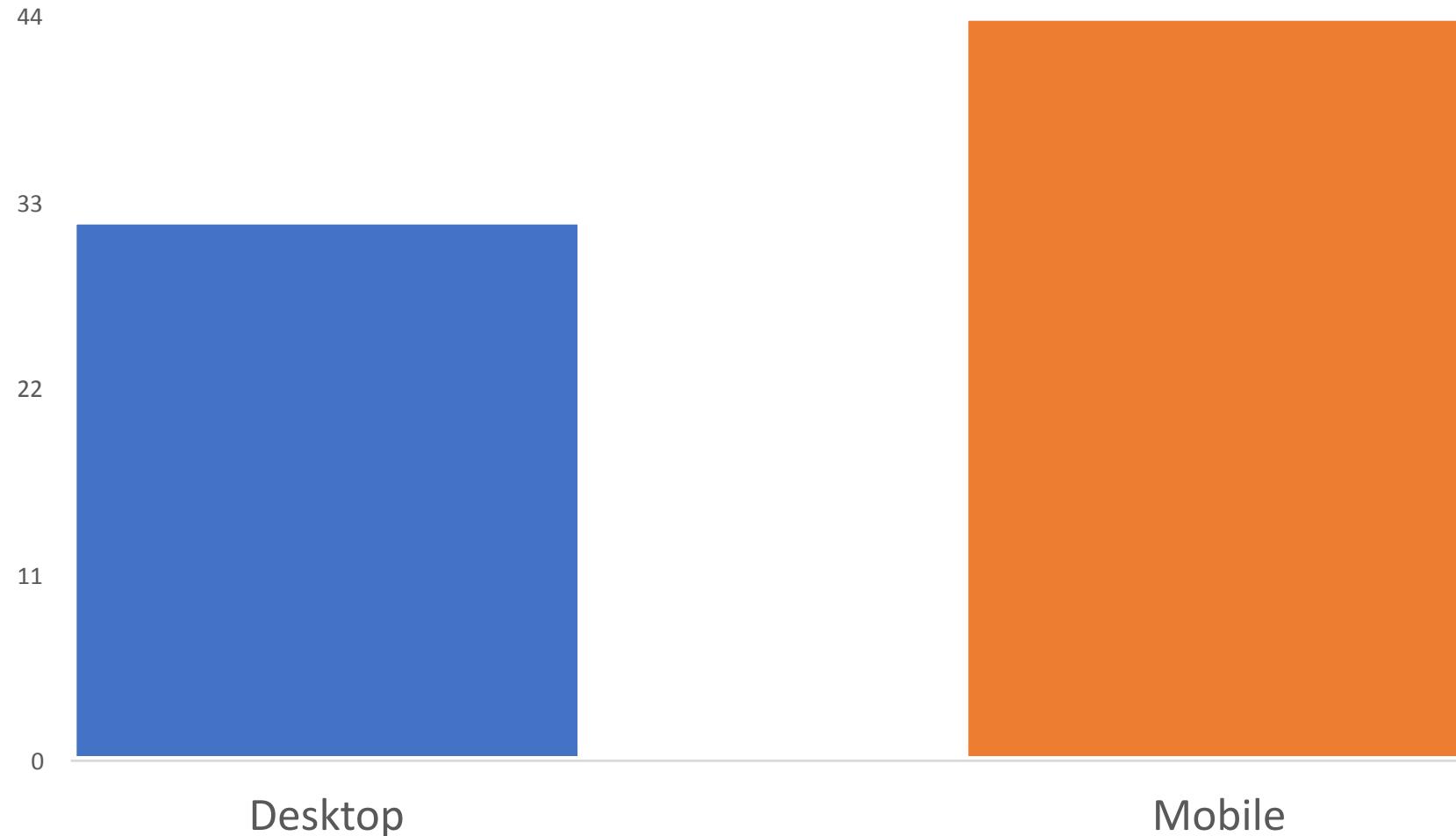
Finance



● Desktop ● Mobile

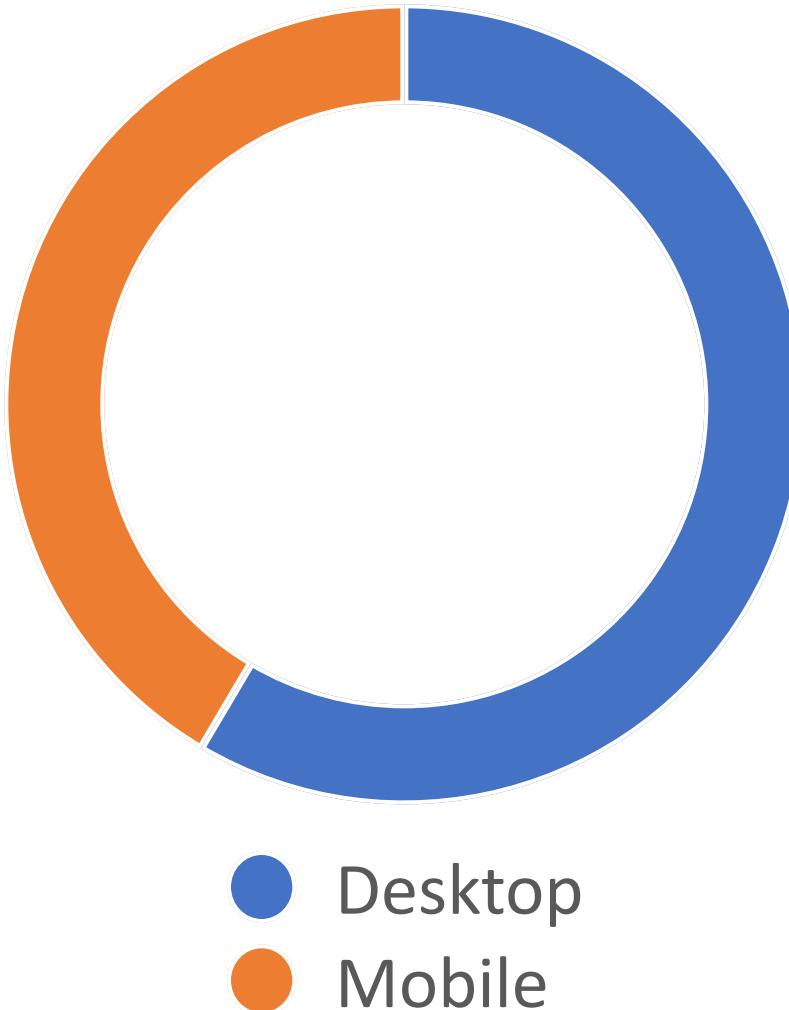
Bounce rates on mobile are 40% higher than desktop*

*Based on 584 billion page views.



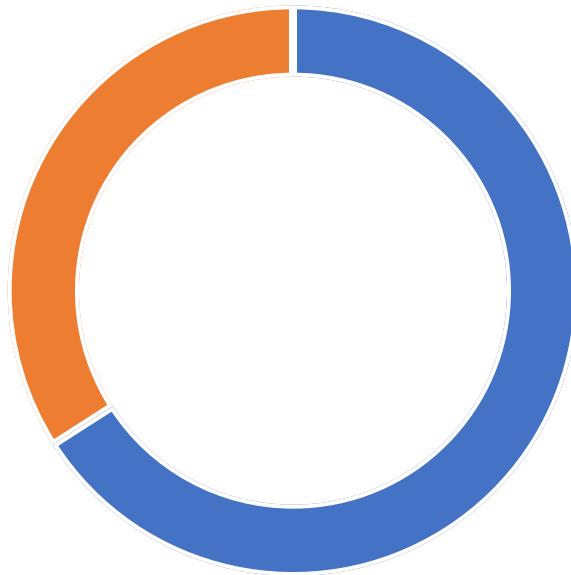
Desktop users view more pages (59%)

*Based on 584 billion page views.



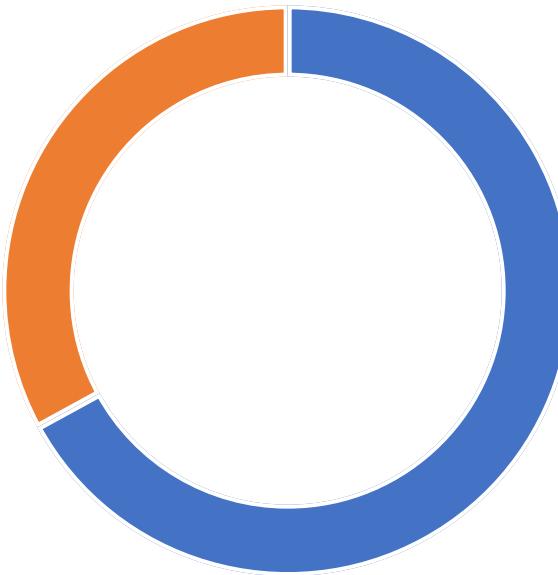
Anywhere from 1.5x to 3x more pages per visit

Food



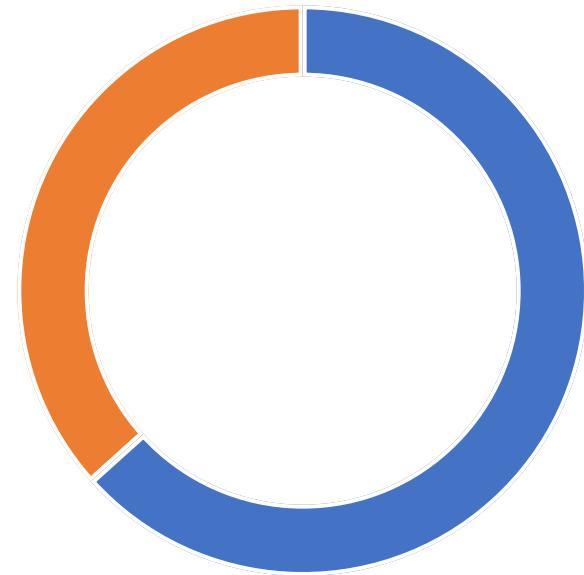
● Desktop ● Mobile

News



● Desktop ● Mobile

Finance



● Desktop ● Mobile

The “desktop” experience matters



Web browsing is
the #1 user activity
on PCs

The image shows a screenshot of a web browser window. At the top, there are standard browser controls: back, forward, refresh, and a search bar containing the URL "keneshabanks.com/blog". To the right of the URL is a small profile icon. Below the header, the main content area displays a blog post. The title of the post is "Pops of Metallic" in a bold, black, sans-serif font. Underneath the title is the date "June 18, 2017". The main body of the post features two photographs. The left photograph shows a person from the waist down, wearing a long, light-colored button-down shirt over a dark t-shirt and dark jeans, carrying a white shoulder bag. The right photograph is a close-up of a person's foot wearing a shiny, metallic gold loafer. The overall aesthetic is clean and modern.

Blog

keneshabanks.com/blog

K.

Pops of Metallic

June 18, 2017



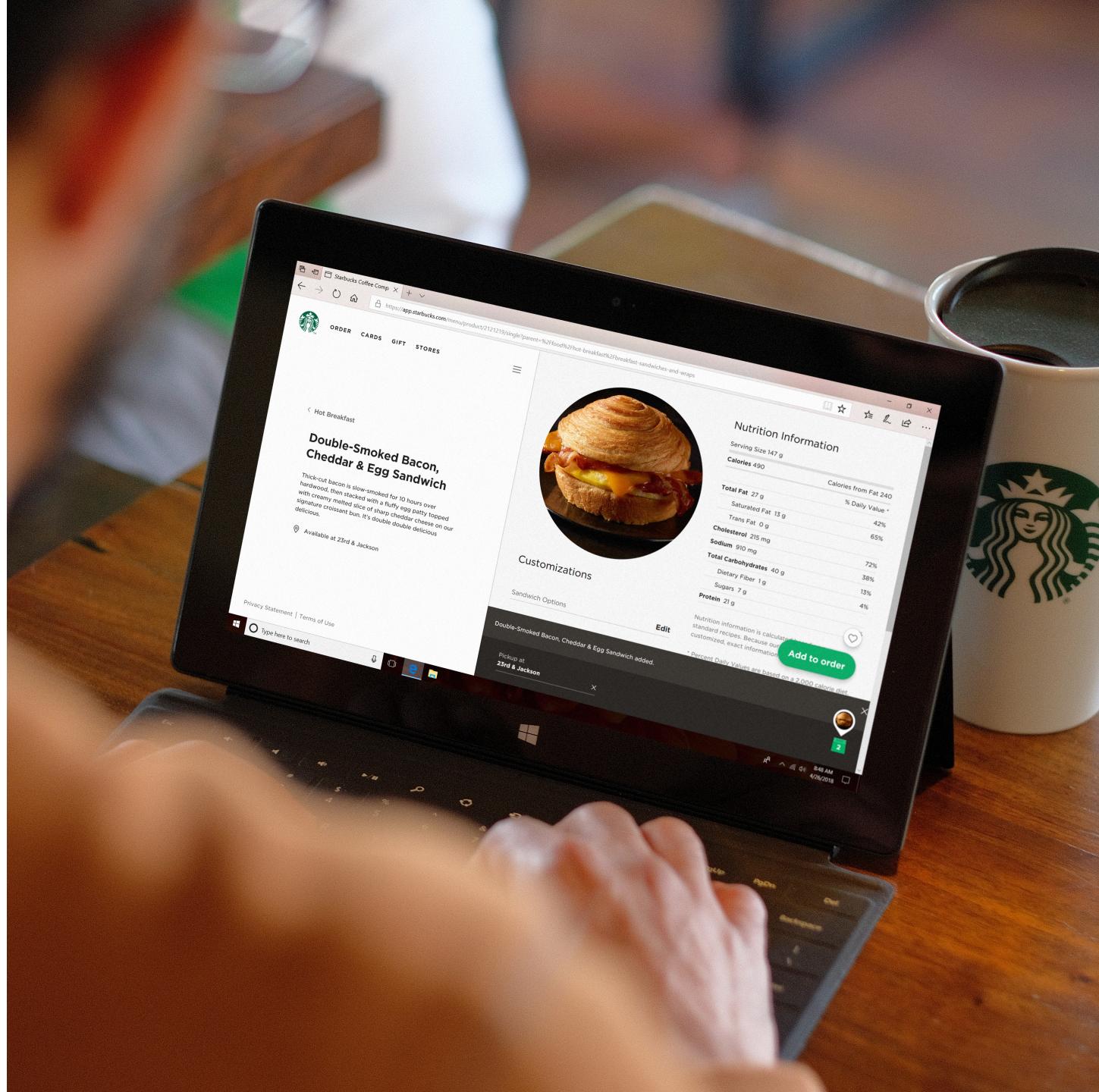
Search the web and Windows



The “desktop” experience matters,
even for Progressive Web Apps



40% of Order Ahead transactions on the Starbucks PWA come from desktop

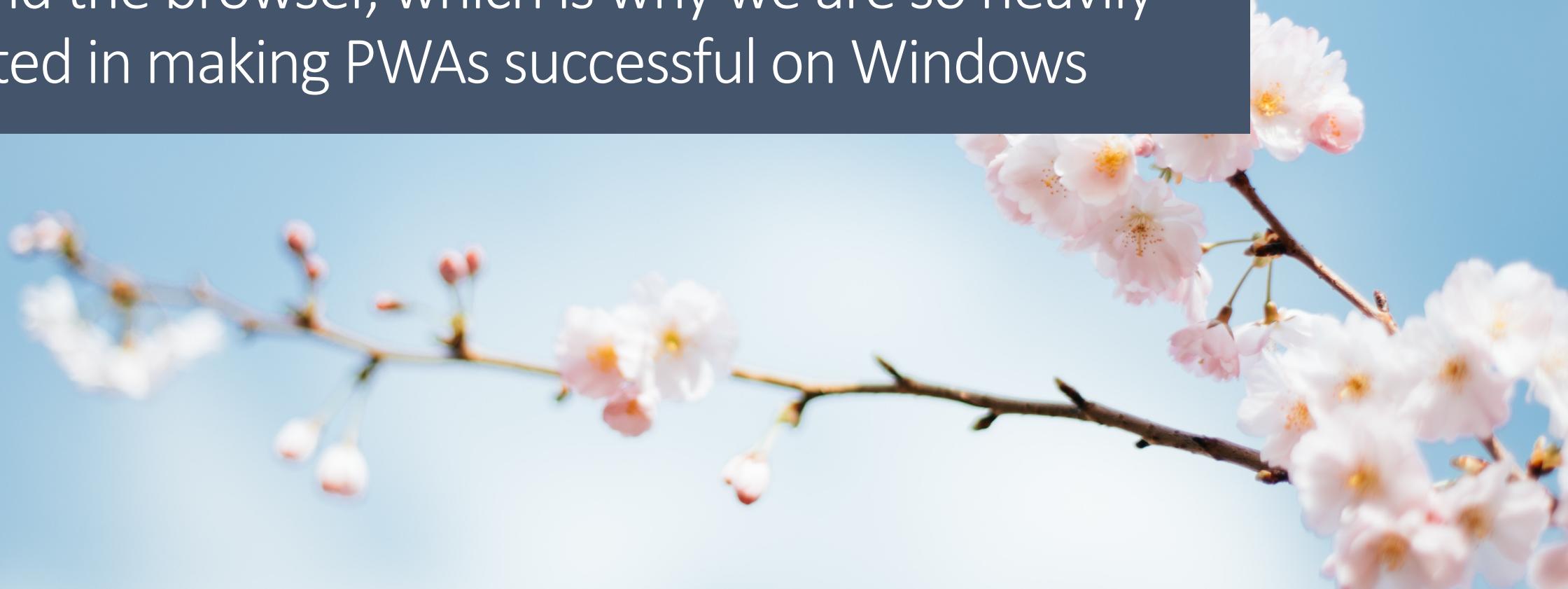




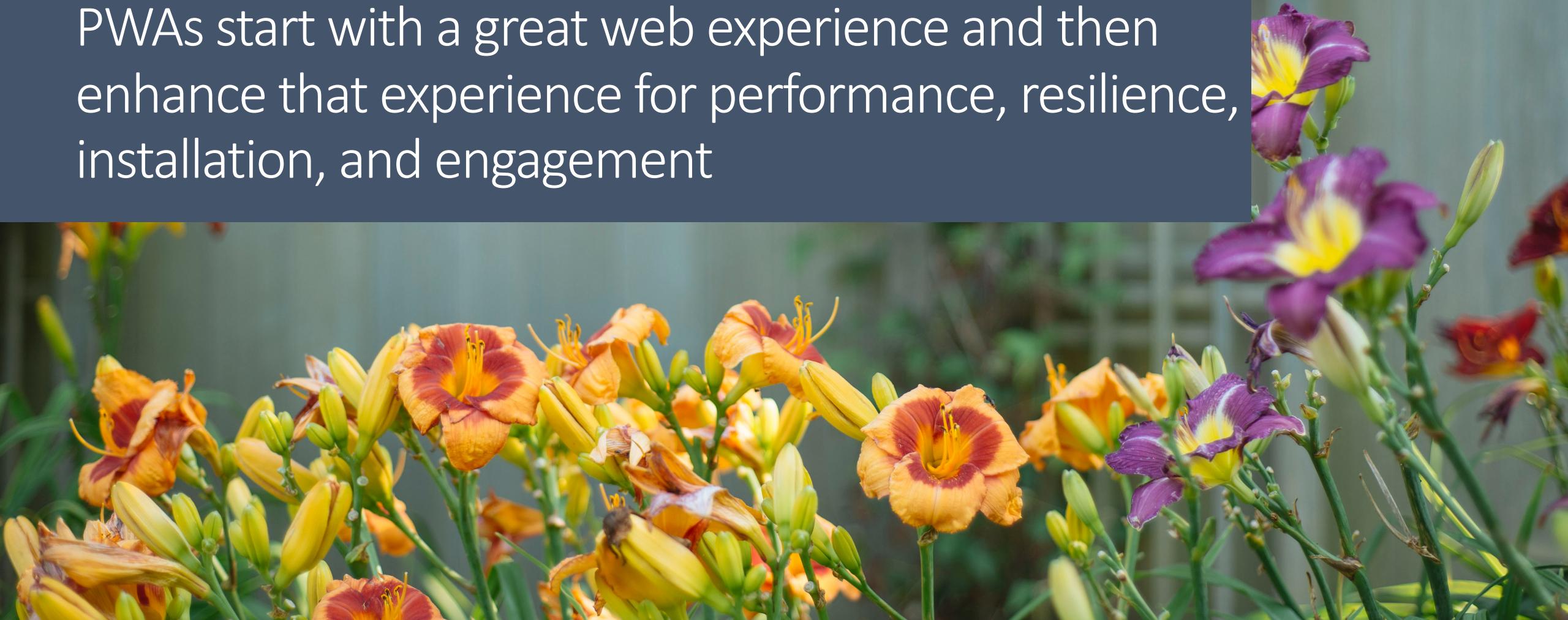
Carnival Cruise Line saw
a 16% opt-in
for Push Notifications
on desktop



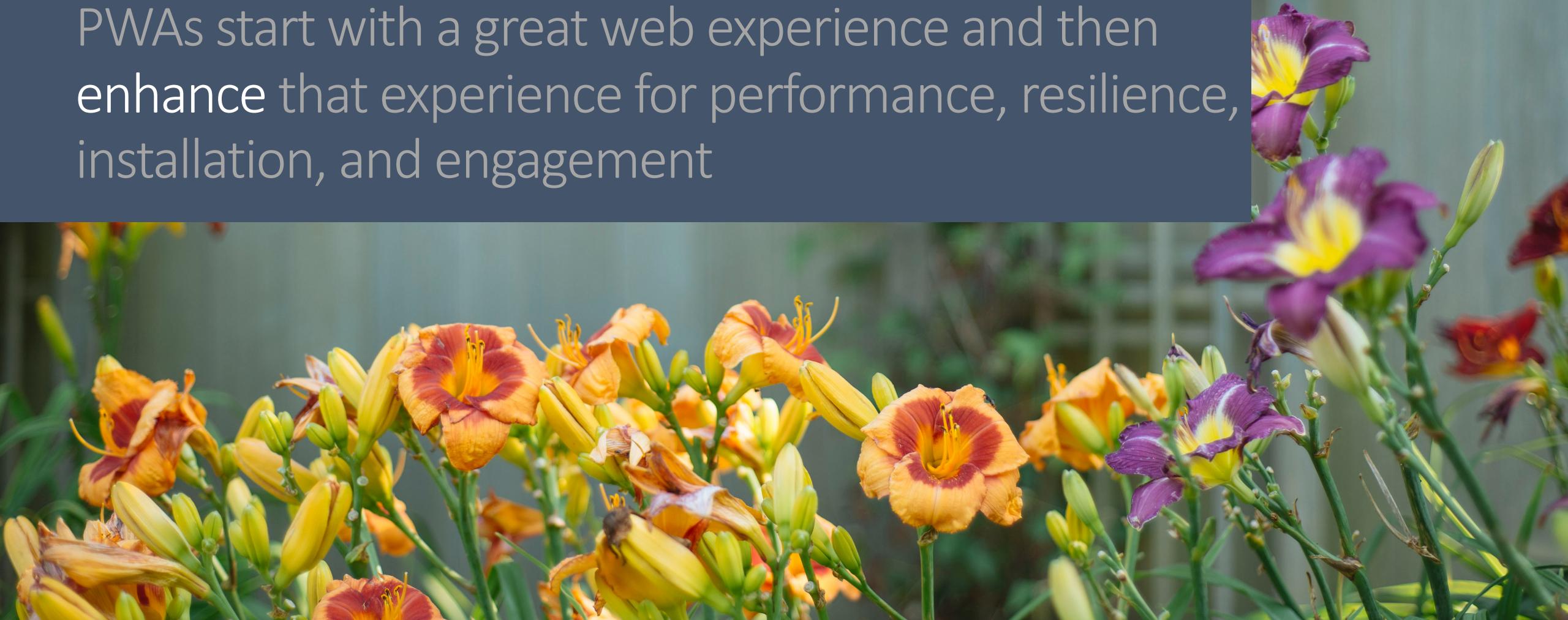
We believe the web can (and should) reach beyond the browser, which is why we are so heavily invested in making PWAs successful on Windows



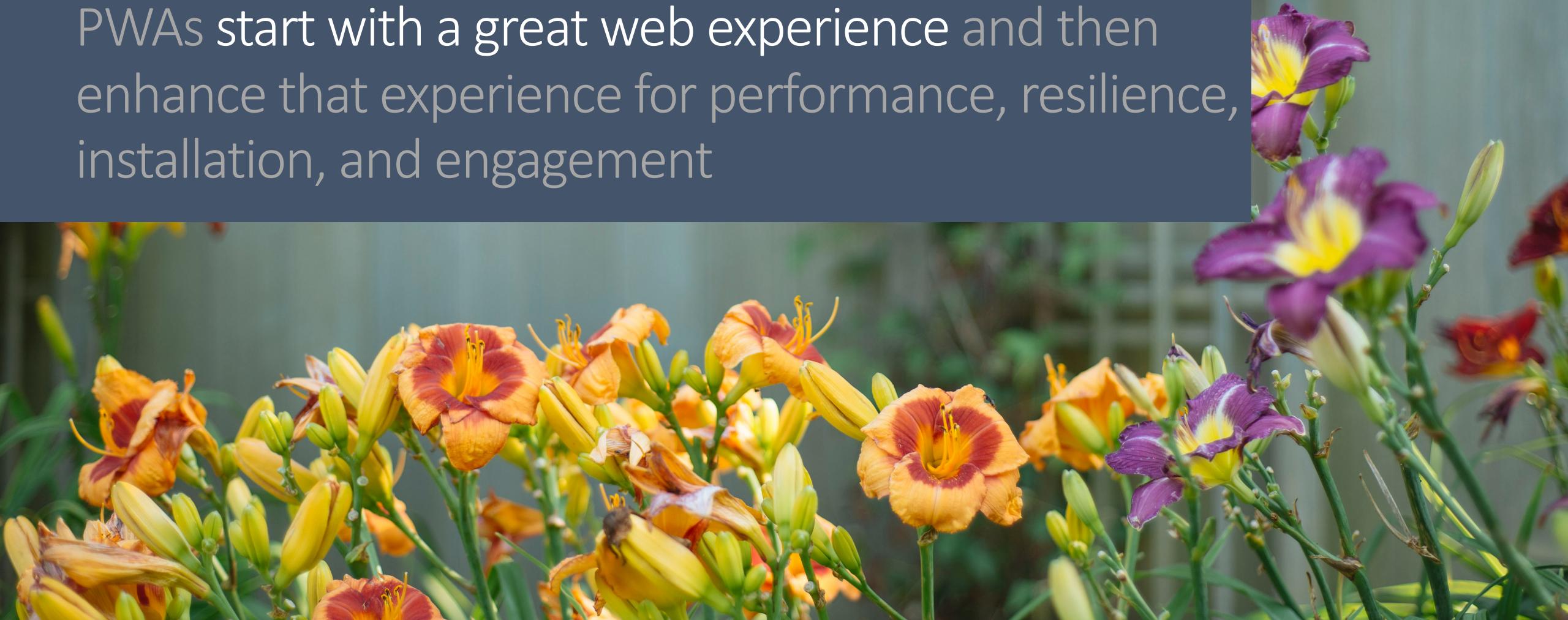
PWAs start with a great web experience and then enhance that experience for performance, resilience, installation, and engagement



PWAs start with a great web experience and then enhance that experience for performance, resilience, installation, and engagement



PWAs start with a great web experience and then enhance that experience for performance, resilience, installation, and engagement



Progressive

/prə'gresiv/

happening or developing gradually or in stages; proceeding step by step





Step 1
Focus on what matters

Consider forbes.com circa 2007



U.S. EUROPE ASIA

Search: **Forbes.com**

Quotes

Video

Web

Blogs

Advanced

Go

HOME PAGE FOR THE WORLD'S BUSINESS LEADERS

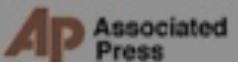
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Book Is Inside Look at War on Terror

By PETE YOST 09.07.07, 3:25 PM ET

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WASHINGTON -Vice President Dick Cheney and other Bush administration officials "blew through" legal constraints they didn't like and weakened the presidency with a go-it-alone approach in the war on terror, a former Justice Department official writes in a new book.

In "The Terror Presidency," former assistant attorney general Jack Goldsmith details what he calls "one of the underappreciated stories in the war on terror." The book will be published in the fall.

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The Illusion of Control i

alistapart.com/article/the-illusion-of-control-in-web-design#comments

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ARTICLES EVENTS TOPICS WRITE FOR US

ALISTAPART

The Illusion of Control in Web Design

by Aaron Gustafson · April 26, 2018
Published in Code

“Mobile first” thinking

d robust and engaging web experiences. We scrutinize every detail of an end hours getting the animation swing just right. We refactor our tiny fractions of a second off load times. We control absolutely everything we can, but the harsh reality is that we control less than we think.

Last week, two events reminded us, yet again, of how right Douglas Crockford was when he declared the web “the most hostile software engineering environment imaginable.” Both were serious enough to take down an entire site—actually hundreds of entire sites, as it turned out. And both were avoidable.

In understanding what we control (and what we don’t), we will build resilient, engaging products for our users.

What happened?

The first of these incidents involved the launch of Chrome 66. With that release, Google implemented a security patch with serious implications for folks who weren’t paying attention. You might recall that quite a few questionable SSL certificates issued by Symantec Corporation’s PKI began to surface early last year. Apparently, Symantec had

6 comments

Share this on

Become a patron

11:27 AM
5/1/2018



Remember that text is the first interface



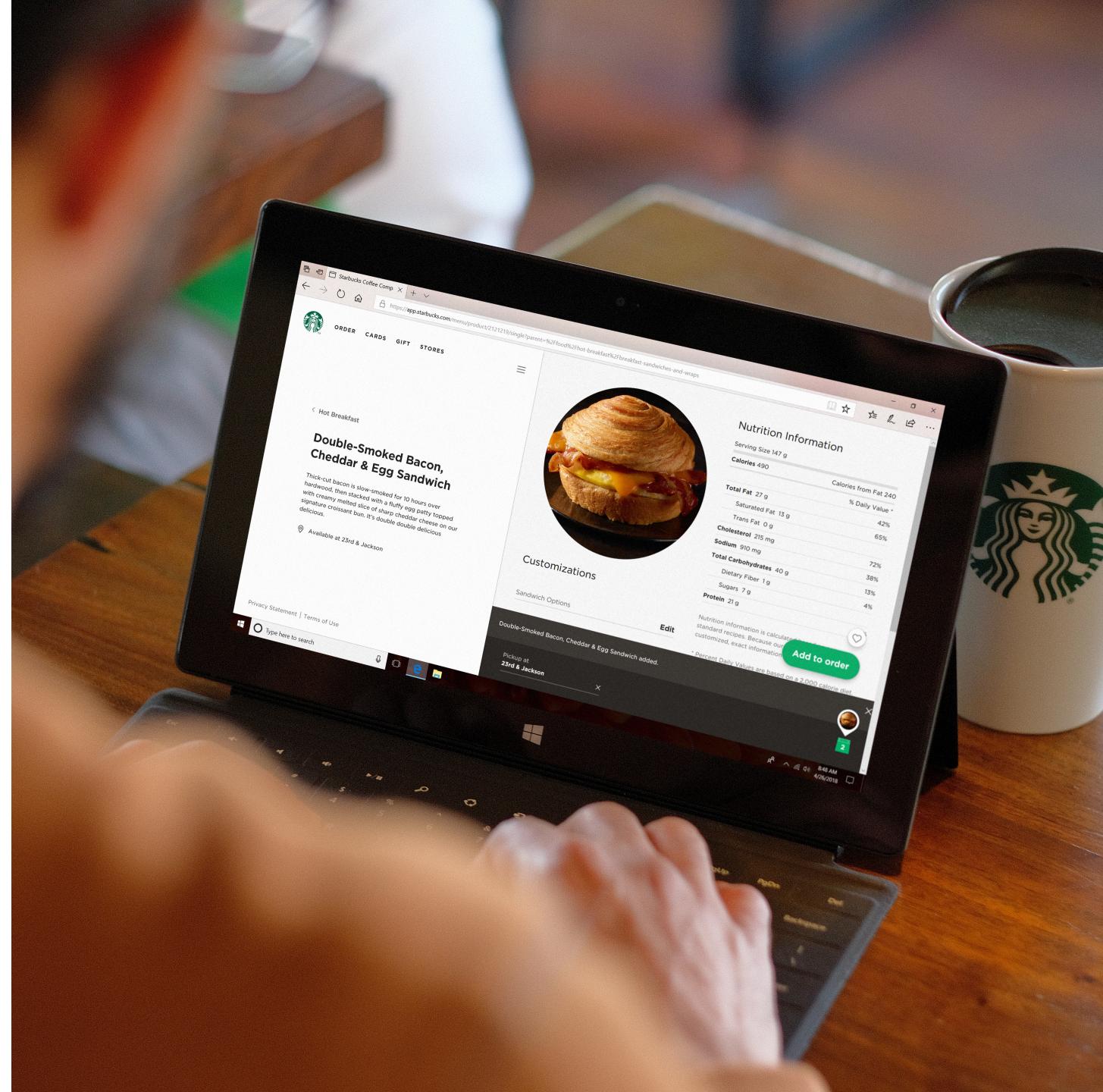
Is there anything missing that would help users be more successful?

Finding Our Focus

Josh Williams
Starbucks

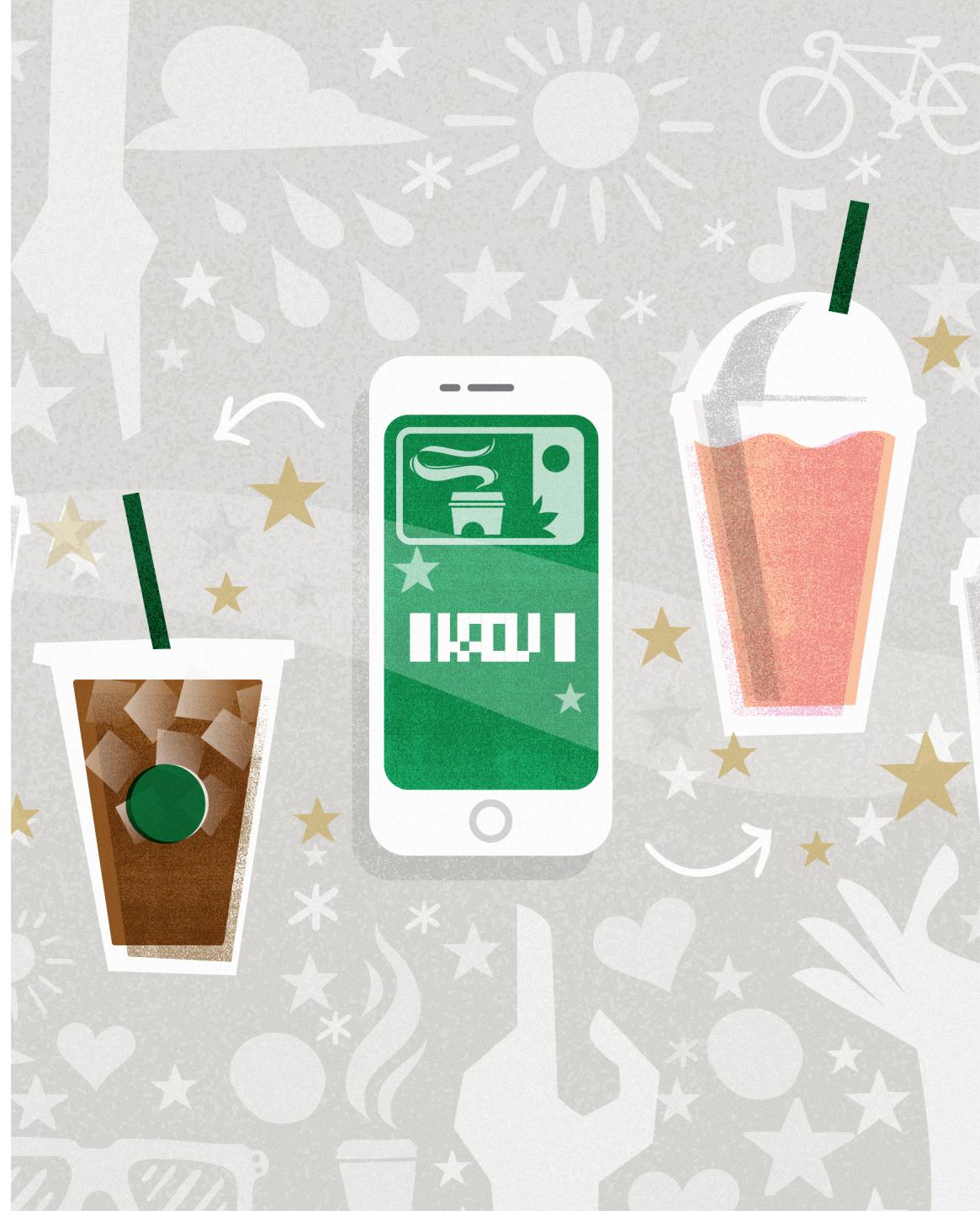
Task first?

Turns out customers like to “do” things with the apps we build



We focused on our key customer journeys

- ⌚ Enable customers to join the Starbucks Rewards program
- ⌚ Enable customers to transact via Order Ahead and Barcode Pay
- ⌚ Enable customers to track progress towards their earned rewards

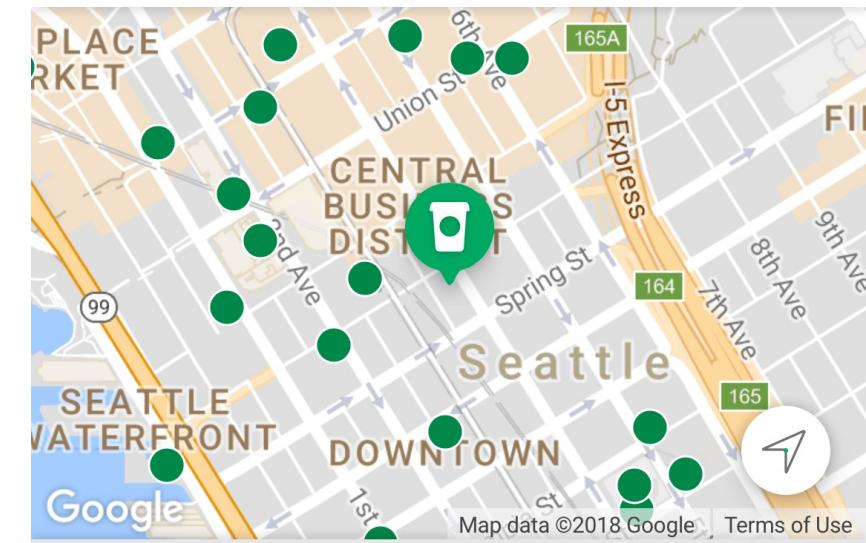




Store Locator was our
first actual production
“PWA” feature

And it was chromed in the previous site

Find a store Filter



4th & Seneca

Open until 7:00 PM

1.9 miles away



2nd & Seneca

Closed

1.8 miles away



505 Union Stn

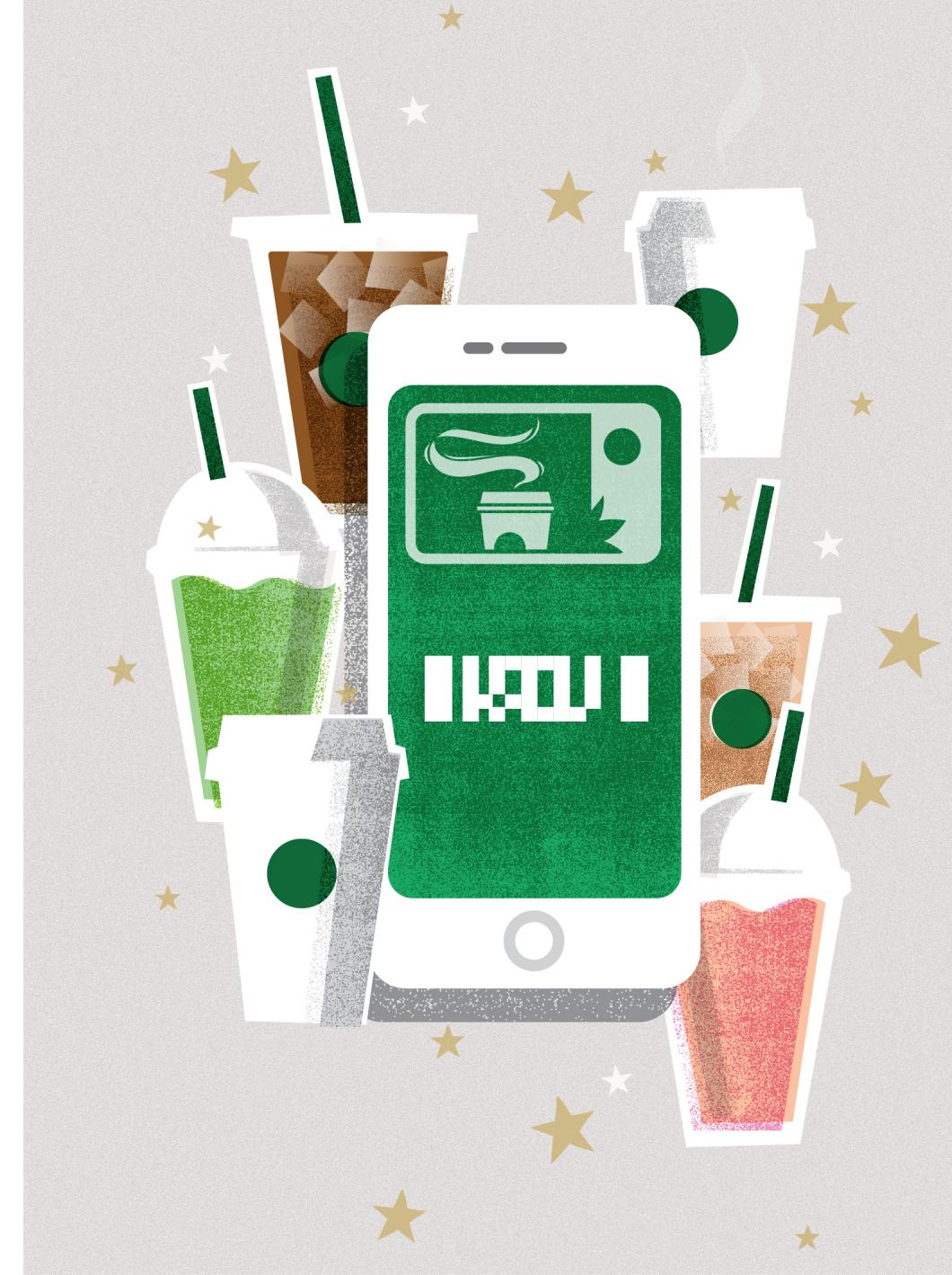
Open until 7:00 PM

1.3 miles away



From there, we were able to add in other key features

- ⌚ Sign-in and Account Create
- ⌚ Barcode pay
- ⌚ eGift and Account management
- ⌚ etc.





ORDER CARDS GIFT



Good morning, Joshua. ☀️

1238 ★

9 free drink or food Rewards
Collect 12 more Stars for another Reward

125 ★ 125 ★ 125 ★ 125 ★ 125 ★
125 ★ 125 ★ 125 ★ 125 ★ 113 ★

Enter a star code



Hit refresh on iced tea 🌸

Premium teas with fruit & botanical blends and a little sweetness.

Pay

Order

Finding Our Focus

Josh Williams
Starbucks

Step 2

Use markup that supports the core experience



A photograph of a vast field of yellow flowers, likely canola or mustard, under a clear blue sky. The flowers are in sharp focus in the foreground, while the sky and distant flowers are slightly blurred. A dark rectangular overlay contains the text.

The words we choose matter,
but the markup we use matters equally

What does it mean?

```
<div class="entry">
  <div class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</div>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
    <div><b>Reading Time</b> 25 minutes</div>
  </div>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</div>
```

This **div** marks up a piece of self-contained content

```
<div class="entry">
  <div class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</div>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
    <div><b>Reading Time</b> 25 minutes</div>
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  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</div>
```

There's a tag for that: **article**

```
<article class="entry">
  <div class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</div>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
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  </div>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

This **div** is the title of the blog post

```
<article class="entry">
  <div class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</div>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
    <div><b>Reading Time</b> 25 minutes</div>
  </div>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

There's a tag for that: **h1-h6**

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
    <div><b>Reading Time</b> 25 minutes</div>
  </div>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

These **div** elements define various properties of the post

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <div class="entry__meta">
    <div><b>Published</b> 24 May 2017</div>
    <div><b>Reading Time</b> 25 minutes</div>
  </div>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

There's an element for the: **dl**

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <dl class="entry__meta">
    <dt>Published</dt> <dd>24 May 2017</dd>
    <dt>Reading Time</dt> <dd>25 minutes</dd>
  </dl>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

Bonus: **time**

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <dl class="entry__meta">
    <dt>Published</dt> <dd><time>24 May 2017</time></dd>
    <dt>Reading Time</dt> <dd>25 minutes</dd>
  </dl>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

Bonus: **time**

```
<time datetime="2017-05-24">  
  24 May 2017</time>
```

```
<time datetime="2017-05-24T11:13:24">  
  24 May 2017</time>
```

```
<time datetime="2017-05-24T11:13:24-04:00">  
  24 May 2017</time>
```

This is “flow” content with line breaks

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <dl class="entry__meta">
    <dt>Published</dt> <dd><time ...>24 May 2017</time></dd>
    <dt>Reading Time</dt> <dd>25 minutes</dd>
  </dl>
  <div class="entry__content">
    I had the great pleasure of delivering a talk...
    <br><br>
    I do a lot of traveling and it's...
  </div>
</article>
```

This is “flow” content with generic divisions

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <dl class="entry__meta">
    <dt>Published</dt> <dd><time ...>24 May 2017</time></dd>
    <dt>Reading Time</dt> <dd>25 minutes</dd>
  </dl>
  <div class="entry__content">
    <div>I had the great pleasure of delivering a talk...</div>
    <div>I do a lot of traveling and it's...</div>
  </div>
</article>
```

That is meaningful content

```
<article class="entry">
  <h1 class="entry__title">Progressive Web Apps and
    the Windows Ecosystem</h1>
  <dl class="entry__meta">
    <dt>Published</dt> <dd><time ...>24 May 2017</time></dd>
    <dt>Reading Time</dt> <dd>25 minutes</dd>
  </dl>
  <div class="entry__content">
    <p>I had the great pleasure of delivering a talk...</p>
    <p>I do a lot of traveling and it's...</p>
  </div>
</article>
```

A photograph of a vast field of yellow flowers, likely canola or mustard, under a clear blue sky. The flowers are in sharp focus in the foreground and middle ground, while the background is slightly blurred. A dark blue rectangular box is overlaid on the upper left portion of the image, containing white text.

With CSS it all looks the same anyway,
so why should I care?

Readability

Progressive Web Apps and the Windows Ecosystem

Published 24 May 2017

Reading Time 25 minutes

I had the great pleasure of delivering a talk...

I do a lot of traveling and it's...

Readability

Progressive Web Apps and the Windows Ecosystem

Published

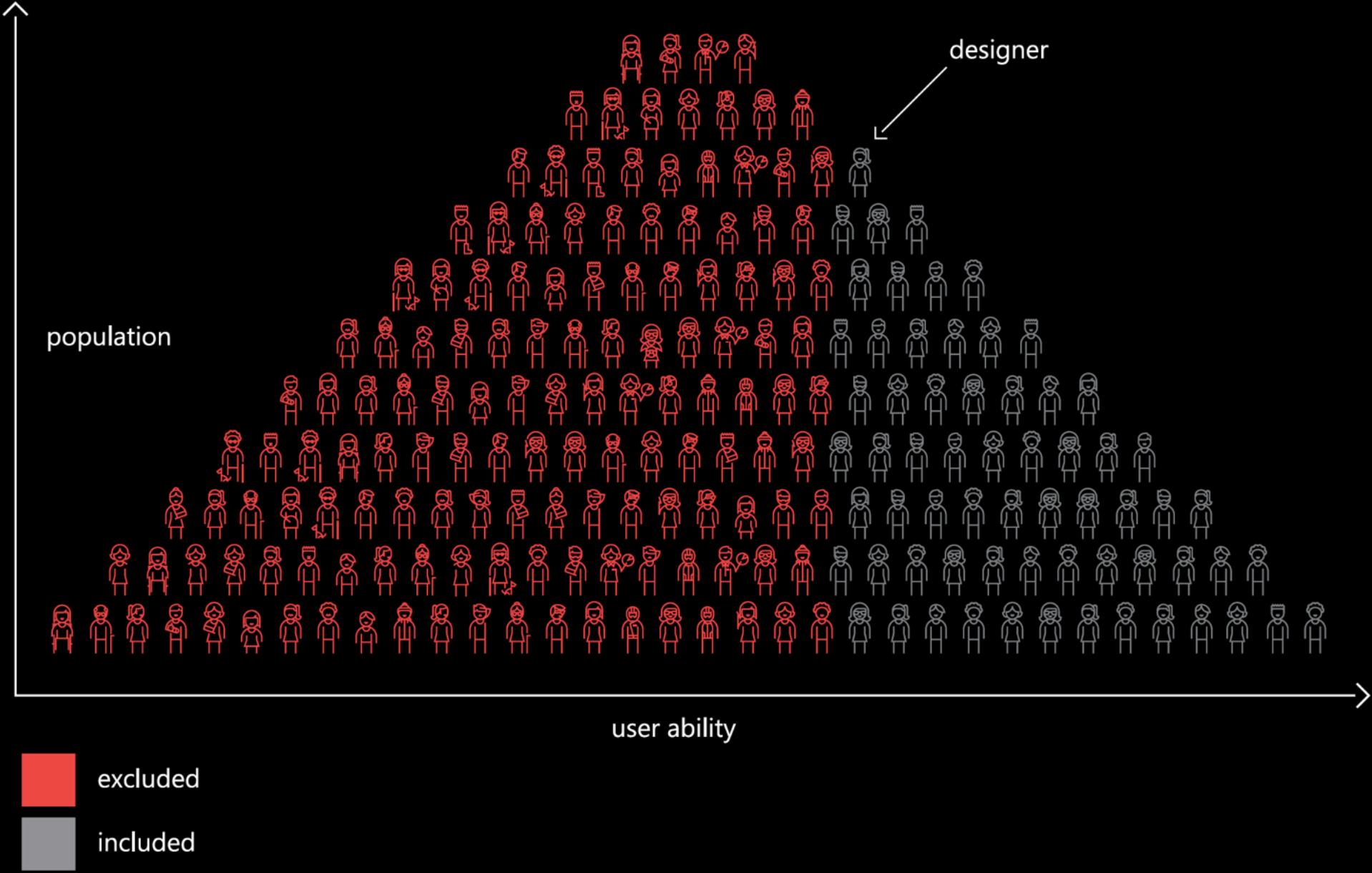
24 May 2017

Reading Time

25 minutes

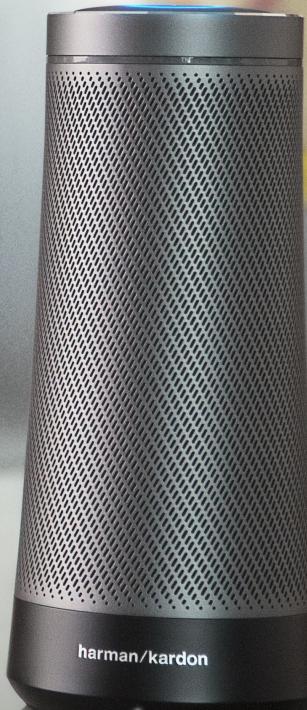
I had the great pleasure of delivering a talk...

I do a lot of traveling and it's...





Hey Cortana, read me the top three
headlines in today's New York Times



Accessing content via semantics:

```
function extractHeadlines( response ){  
  var $html = document.createElement('div'),  
      $headings, i=0, headlines=[];  
  $html.innerHTML = response.contents;  
  $headings = $html.querySelectorAll('#top-news')  
    .querySelectorAll('article h1, article h2, article h3');  
  heading_count = $headings.length;  
  while (headlines.length < 3) {  
    let $link = $headings[i].querySelector('a');  
    if ($link && $link.href) {  
      headlines.push({  
        title: $headings[i].innerText.trim(),  
        link: $link.href  
      });  
    }  
    i++;  
  }  
  console.log( headlines );  
}
```

Accessing content via semantics:

```
function extractHeadlines( response ){  
  var $html = document.createElement('div'),  
      $headings, i=0, headlines=[];  
  $html.innerHTML = response.contents;  
  $headings = $html.querySelectorAll('#top-news')  
    .querySelectorAll('article h1, article h2, article h3');  
  heading_count = $headings.length;  
  while (headlines.length < 3) {  
    let $link = $headings[i].querySelector('a');  
    if ($link && $link.href) {  
      headlines.push({  
        title: $headings[i].innerText.trim(),  
        link: $link.href  
      });  
    }  
    i++;  
  }  
  console.log( headlines );  
}
```

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Developing Dependency Awareness

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I'm sure you've heard the proverb, "A chain is only as strong as its weakest link," probably many times. Its written origin dates back to the 18th century, but I wouldn't be surprised if it was much, much older. And though the work we do has little to do with

Let's say you needed to code a button...



Sign Up

```
<input type="submit" value="Sign Up">  
  
<button type="submit">Sign Up</button>  
  
<a class="button" href="#">Sign Up</a>  
  
<div class="button">Sign Up</div>
```

Let's compare

Pattern	Display	Semantics	Focusable?	Activate By	Submits Forms
<code>input[type=submit]</code>	button	button	Yes	Mouse, touch, ENTER, SPACE	Yes
<code>button[type=submit]</code>	button	button	Yes	Mouse, touch, ENTER, SPACE	Yes
<code>a</code>	link	Named generic	Yes	Mouse, touch, ENTER	No
<code>div</code>	block	Not exposed	No	N/A	No

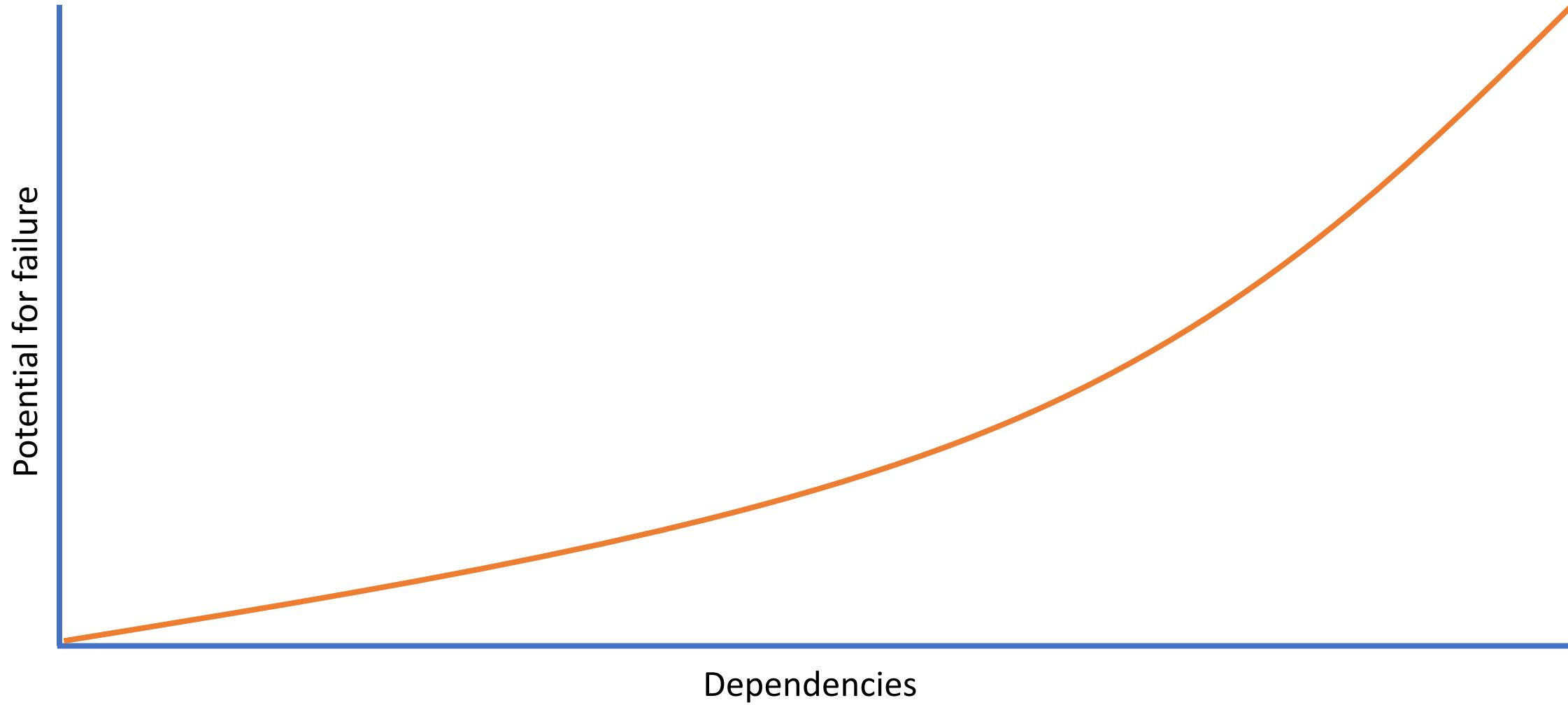
UX gaps that need to be filled

Pattern	Display	Semantics	Focusable?	Activate By	Submits Forms
input[type=submit]	button	button	Yes	Mouse, touch, ENTER, SPACE	Yes
button[type=submit]	button	button	Yes	Mouse, touch, ENTER, SPACE	Yes
a	link	Named generic	Yes	Mouse, touch, ENTER	No
div	block	Not exposed	No	N/A	No

Filling those gaps introduces dependencies

Pattern	Display	Semantics	Focusable?	Activate By	Submits Forms
<code>input[type=submit]</code>	None	None	None	None	None
<code>button[type=submit]</code>	None	None	None	None	None
<code>a</code>	CSS	ARIA	None	JavaScript	JavaScript
<code>div</code>	CSS	ARIA	HTML	JavaScript	JavaScript

More dependencies, more (potential) problems



Disaster averted

A screenshot of a Twitter post from Michael Spellacy (@Spellacy). The post features a profile picture of Michael Spellacy, a man with glasses and a beard, wearing a shirt with a logo. The tweet text is: "Do you think progressive enhancement is a waste of time? Think again! Chrome 66 just knocked out SSL on a CDN that hosted CSS and JS for 200 of my employer's sites and most of them still work with good ol' HTML! @AaronGustafson would be proud! :-)" The timestamp at the bottom left is 10:15 PM - 18 Apr 2018.

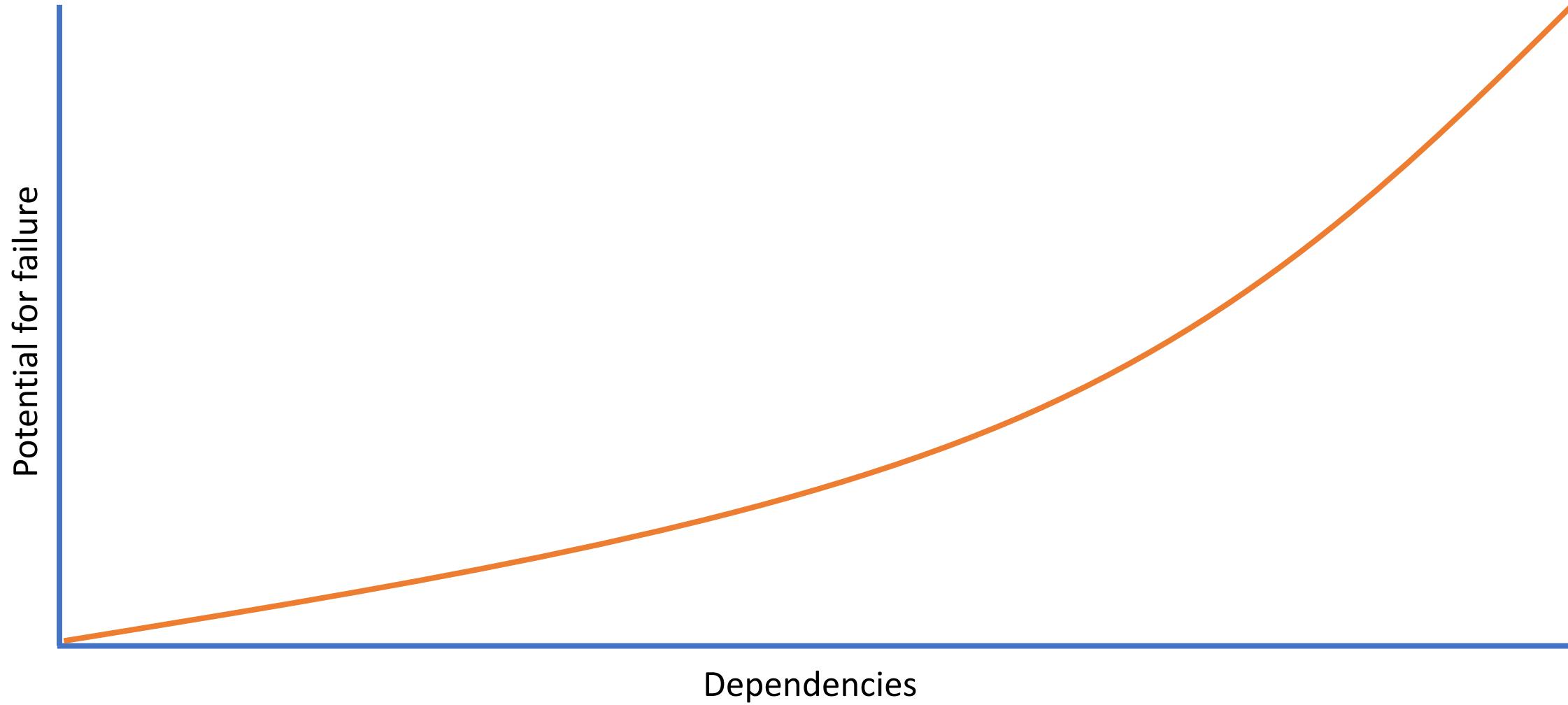
Michael Spellacy
@Spellacy

Follow

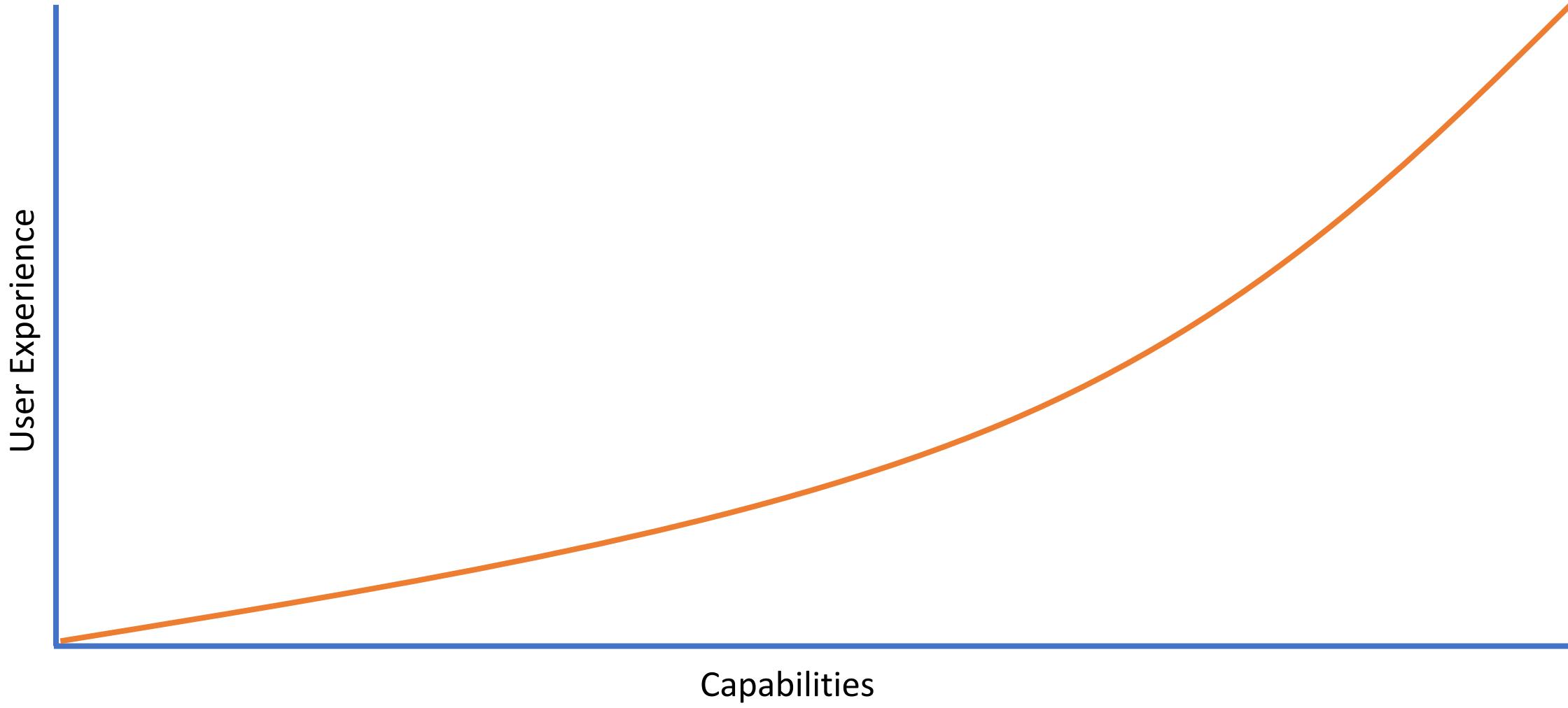
Do you think progressive enhancement is a waste of time? Think again! Chrome 66 just knocked out SSL on a CDN that hosted CSS and JS for 200 of my employer's sites and most of them still work with good ol' HTML!
@AaronGustafson would be proud! :-)

10:15 PM - 18 Apr 2018

More dependencies, more (potential) problems

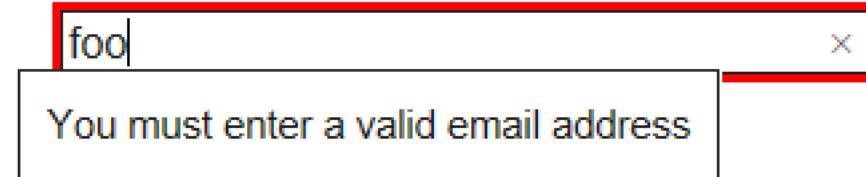


Enhance the experience



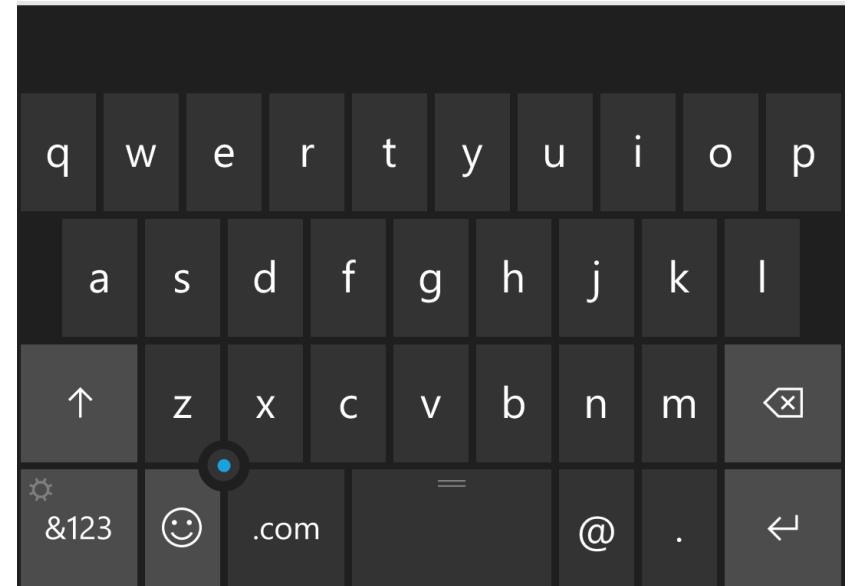
Enhancing UX with markup

```
<input type="email" name="email" id="email"  
      required aria-required="true">
```



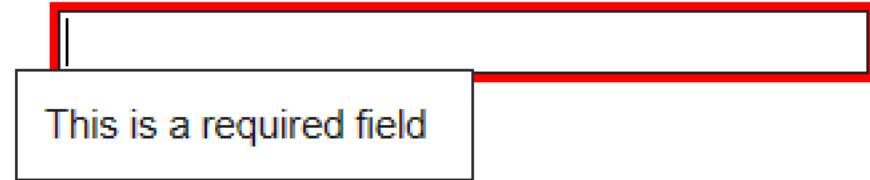
Experience deltas

1. Support for email input type?
2. Validation algorithm implemented?
3. Virtual keyboard?



Enhancing UX with markup

```
<input type="email" name="email" id="email"  
      required aria-required="true">
```



Experience deltas

1. Support for HTML validation?

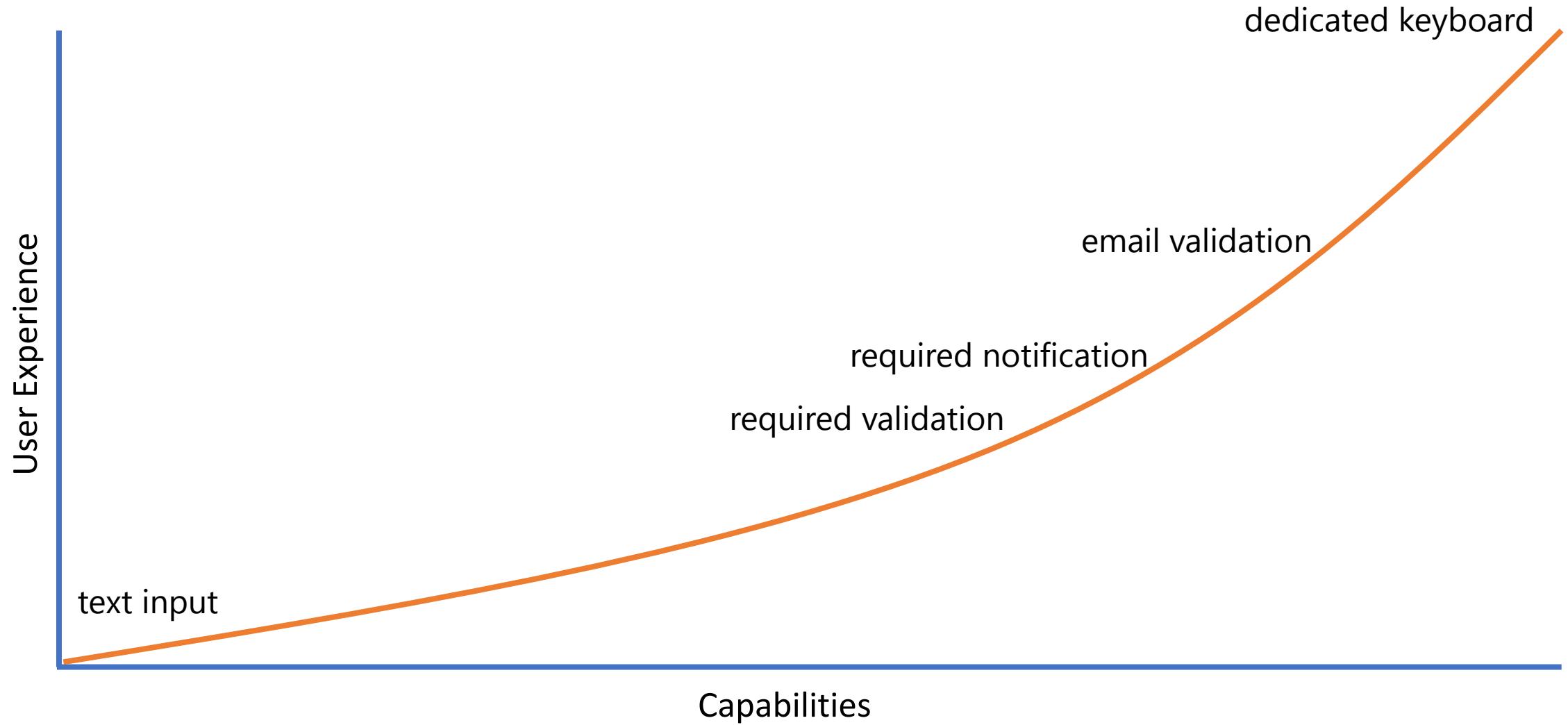
Enhancing UX with markup

```
<input type="email" name="email" id="email"  
      required aria-required="true">
```

Experience deltas

1. Browser exposure of aria-required property?
2. Assistive tech implementation of aria-required?

Enhance the experience



A photograph of a vast field of yellow flowers, likely mustard or rapeseed, stretching towards a clear blue sky. The flowers are in sharp focus in the foreground, while the background is slightly blurred, creating a sense of depth.

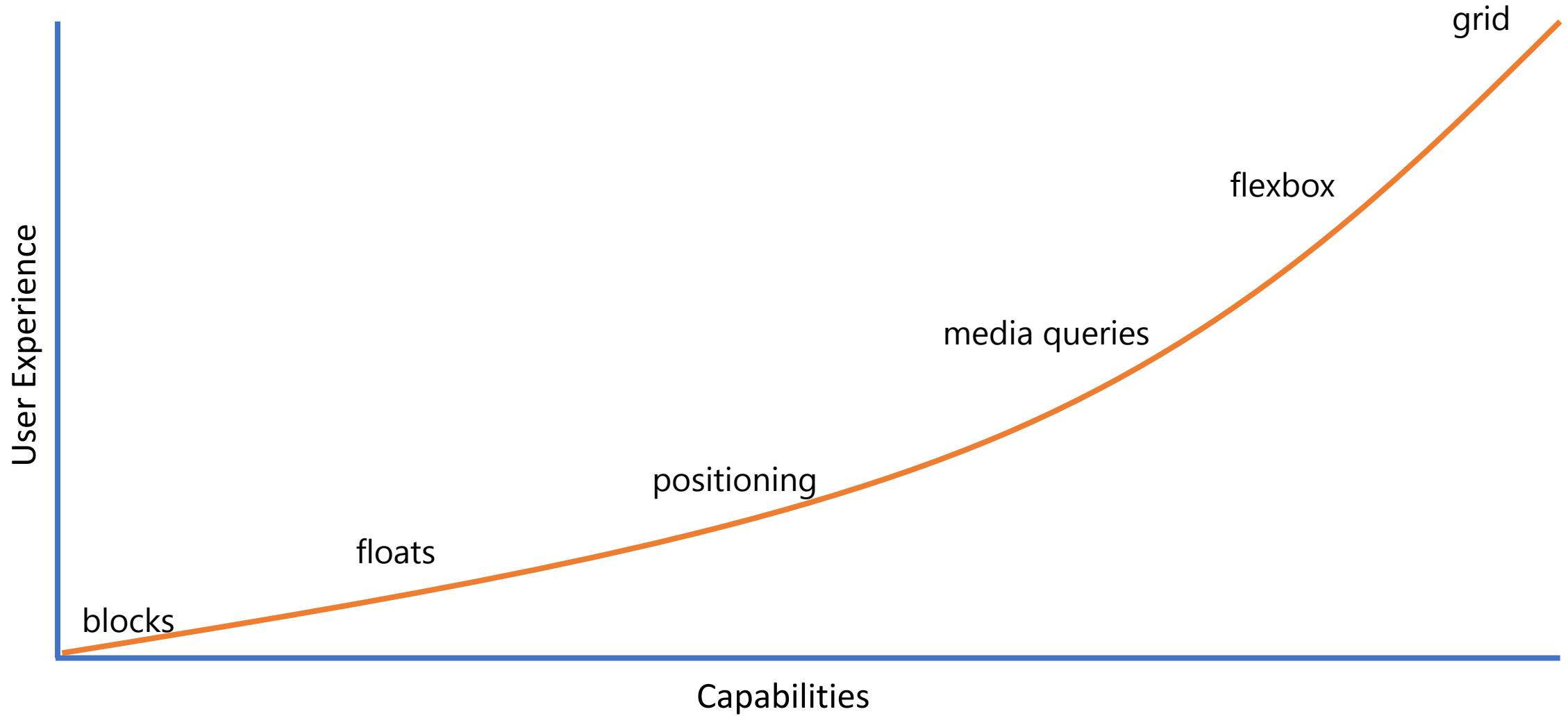
When you think of user experience as a continuum that scales with capabilities, a progressive approach to interfaces is both elegant and powerful.

Step 3

Design in support of the core experience



Enhance the experience



Enhance!



Basic, but ok!

ay!

Gridbyexample

Progressive Enhancement

Grid Garden

Progressive Enhancement Demo

Leverage the power of CSS Grid Layout!

Read [this article](#) for details on how to use CSS Grid Layout today.

I've been amazed at how often those outside the discipline of design assume that what designers do is decoration—likely because so much bad design simply is decoration. Good design isn't. [Good design is problem solving.](#)

— Jeff Veen



Tools for graphic design

⌚ Alignment

⌚ Balance

⌚ Contrast

⌚ Emphasis

⌚ Gestalt

⌚ Harmony

⌚ Movement

⌚ Proportion

⌚ Proximity

⌚ Repetition

⌚ Rhythm

⌚ Unity

⌚ White Space

Tools for graphic design

⌚ Alignment

⌚ Balance

⌚ Contrast

⌚ Emphasis

⌚ Gestalt

⌚ Harmony

⌚ Movement

⌚ Proportion

⌚ Proximity

⌚ Repetition

⌚ Rhythm

⌚ Unity

⌚ White Space

Alignment

[ORDER](#) [CARDS](#) [GIFT](#) [STORES](#) ≡

Order

[Menu](#) [Previous](#) [Favorites](#)

DRINKS

	Hot Coffees		Hot Teas
	Hot Drinks		Frappuccino® Blended Beverages
	Cold Coffees		Iced Teas
	Cold Drinks		

FOOD

For item availability, choose a store ▾



Contrast

Medium



MEMBER FEATURE STORY

Believing Women Means Believing Their Pain

A notoriously dangerous birth control device reveals the extent to which the medical establishment disbelieves women's pain



Sady Doyle [Follow](#)

Apr 16 · ★ 5 min read



Melissa Davis Gilbert with her husband before her surgery in 2017. Gilbert has had the Essure device for about 10 years, and her symptoms — pelvic pain, fatigue, rashes, joint swelling — have gotten worse. In deciding to remove the device, it would mean she would have to get a hysterectomy. Photo by Katherine Frey/The Washington Post via Getty Images

Proportion

≡ Menu



Proximity



Create FREE Account

EMAIL

email@example.com

PASSWORD

Enter your password

- Minimum 8 Characters
- 1 Capital Letter
- 1 Lowercase Letter
- 1 Number

Create FREE Account

By clicking Create FREE Account, I have read and agreed
to the [terms and conditions](#)

Rhythm

This is a header

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Quasi reprehenderit sint obcaecati reiciendis voluptas voluptate excepturi recusandae ab accusamus deleniti facilis, illo placeat harum, iusto ratione. Ullam laborum voluptas et!

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Quasi reprehenderit sint obcaecati reiciendis voluptas voluptate excepturi recusandae ab accusamus deleniti facilis, illo placeat harum, iusto ratione. Ullam laborum voluptas et!

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Quasi reprehenderit sint obcaecati reiciendis voluptas voluptate excepturi recusandae ab accusamus deleniti facilis, illo placeat harum, iusto ratione. Ullam laborum voluptas et!

This is a header

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Quasi reprehenderit sint obcaecati reiciendis voluptas voluptate excepturi recusandae ab accusamus

Unity



Join Twitter today.

Full name

Phone or Email

Password

Personalize Twitter based on where you've seen Twitter content on the web. [Learn more.](#)

Sign up

By signing up, you agree to the [Terms of Service](#) and [Privacy Policy](#), including [Cookie Use](#). Others will be able to find you by email or phone number when provided.

[Advanced options](#)

Design considerations unique to the web

- ⌚ Screen size
- ⌚ Resolution
- ⌚ Brightness
- ⌚ Color density
- ⌚ User preference
- ⌚ Network speed & quality
- ⌚ Assistive technology

Design considerations unique to the web

- ⌚ Screen size
- ⌚ Resolution
- ⌚ Brightness
- ⌚ Color density
- ⌚ User preference
- ⌚ Network speed & quality
- ⌚ Assistive technology

Design considerations unique to the web

- ⌚ Screen size 👉 Responsive layouts
- ⌚ Resolution 👉 SVG, responsive images
- ⌚ Brightness 👉 Contrast
- ⌚ Color density 👉 Color choice, media queries
- ⌚ User preference 👉
- ⌚ Network speed & quality 👉 Responsive images, system fonts
- ⌚ Assistive technology 👉

Design considerations unique to the web

- ⌚ Screen size
- ⌚ Resolution
- ⌚ Brightness
- ⌚ Color density
- ⌚ User preference
- ⌚ Network speed & quality
- ⌚ Assistive technology

Examples of user preference

⌚ Larger or smaller fonts

```
@media (min-width: 32em) { ... }
```

⌚ High contrast colors

```
@media (-ms-high-contrast: active) { ... }
```

```
@media (-ms-high-contrast: white-on-black) { ... }
```

```
@media (-ms-high-contrast: black-on-white) { ... }
```

⌚ Reduced motion

```
@media screen and (prefers-reduced-motion: reduce) { ... }
```

Assistive technologies

⌚ Vision

- ⌚ Screen magnifiers
- ⌚ Screen readers
- ⌚ Braille printers & refreshable braille displays
- ⌚ High contrast settings

⌚ Motor/mobility

- ⌚ Speech recognition
- ⌚ Mouse settings
- ⌚ Keyboards & keyboard overlays
- ⌚ Eye tracking

⌚ Hearing

- ⌚ Captions & subtitles

Don't rely on color
alone to convey
important information

Confirm

Cancel

Confirm

Cancel

Good contrast
ensures your
content is readable

contrast ratio

Background:

white

8.52

hsla(200, 0%, 0%)

Swap colors

How to use

As you type, the contrast ratio indicated will update.
Hover over the circle to get more detailed information.

When semi-transparent colors are involved as backgrounds, the contrast ratio will have an error margin, to account for the different colors they may be over.

This sample text attempts to visually demonstrate how readable this color combination is, for normal or **bold** text of various sizes and font styles.

Hint: Press the up and down keyboard arrows while over a number inside a functional color notation. Watch it increment/decrement. Try with the Shift or Alt key too!

By Lea Verou • WCAG 2.0 on contrast ratio

Explicit connections
ensure everyone can
follow references

[Figure 3.3](#figure-3-3) shows the lodging article in Safari with only the default browser styles applied.

...

`<figure id="figure-3-3">`

...

`</figure>`

Explicit connections ensure everyone can follow references

[Figure 3.3](#figure-3-3) shows the lodging article in Safari with only the default browser styles applied.

...

<figure id="figure-3-3">
...
</figure>

Registration

left-aligned

Text Box

4px

Slider

20px

15px

32px

34px

Toggle Switch

Off

Toggle Switch

Rating

Rating

Provide ample space around
interactive elements

Email

4px

Telephone number

20px

4px

City

4px

State

20px

4px

Birth Year

4px

Microsoft

[Finish Reading](#)

Consider what
your design
leaves unsaid

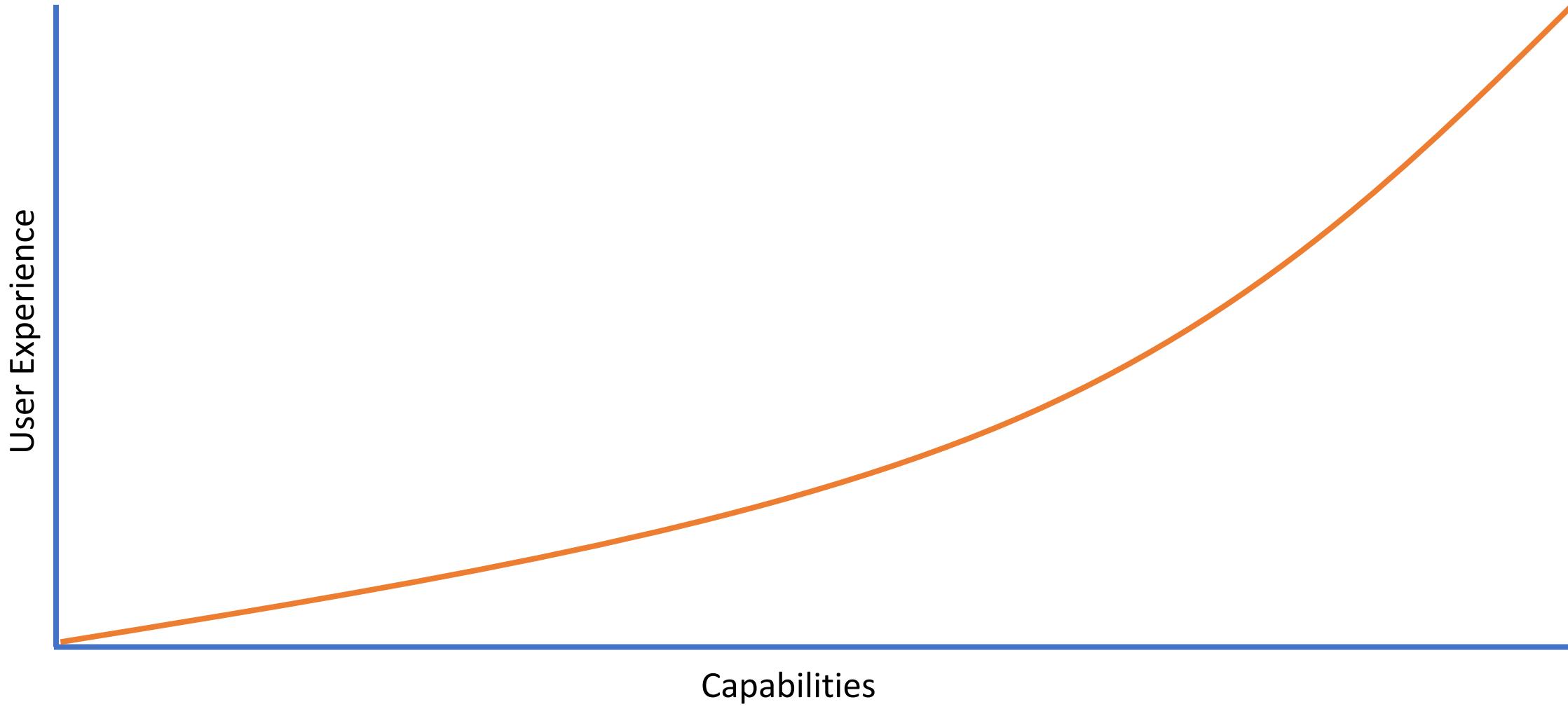
Consider what
your design
leaves unsaid

```
<a href="#">  
  <b class="hidden">You can</b>  
  finish reading  
  <b class="hidden">“The Web  
  Should Just Work for  
  Everyone” in less than  
  10 minutes</b>  
</a>
```

Consider what
your design
leaves unsaid

```
<a href="#">  
  <b class="hidden">You can</b>  
  finish reading  
  <b class="hidden">“The Web  
  Should Just Work for  
  Everyone” in less than  
  10 minutes</b>  
</a>
```

Enhance the experience



Enhancing design in CSS

```
p {  
  color: green;  
  color: rgba(0, 255, 0, .8);  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Enhancing design in CSS

```
p {  
  color: green;  
  color: rgba(0, 255, 0, .8);  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Older browsers without RGBa support, ignore the second rule

Enhancing design in CSS

```
p {  
  color: green;  
  color: rgba(0, 255, 0, .8);  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Modern browsers with RGBa support, overwrite the first rule

Enhancing design in CSS

```
h1:has(+ p) {  
  color: green;  
}
```

**Passwords can be
a hassle**

(That selects h1s that have adjacent sibling paragraphs.)

Enhancing design in CSS

```
h1:has(+ p) {  
  color: green;  
}
```

**Passwords can be
a hassle**

Browsers that don't support :has() ignore the entire rule set

Enhancing design in CSS

```
h1:has(+ p) {  
  color: green;  
}
```

**Passwords can be
a hassle**

As browsers support :has(), matching h1s will turn green

Enhancing design in CSS

```
@media only screen {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Enhancing design in CSS

```
@media only screen {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Browsers without media query support ignore the block

Enhancing design in CSS

```
@media only screen {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Browsers with media query support apply it

Enhancing design in CSS

```
@supports (display: grid) {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Enhancing design in CSS

```
@supports (display: grid) {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Browsers that don't grok @supports ignore the block

Enhancing design in CSS

```
@supports (display: grid) {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Browsers that understand @supports, but don't display grid ignore it

Enhancing design in CSS

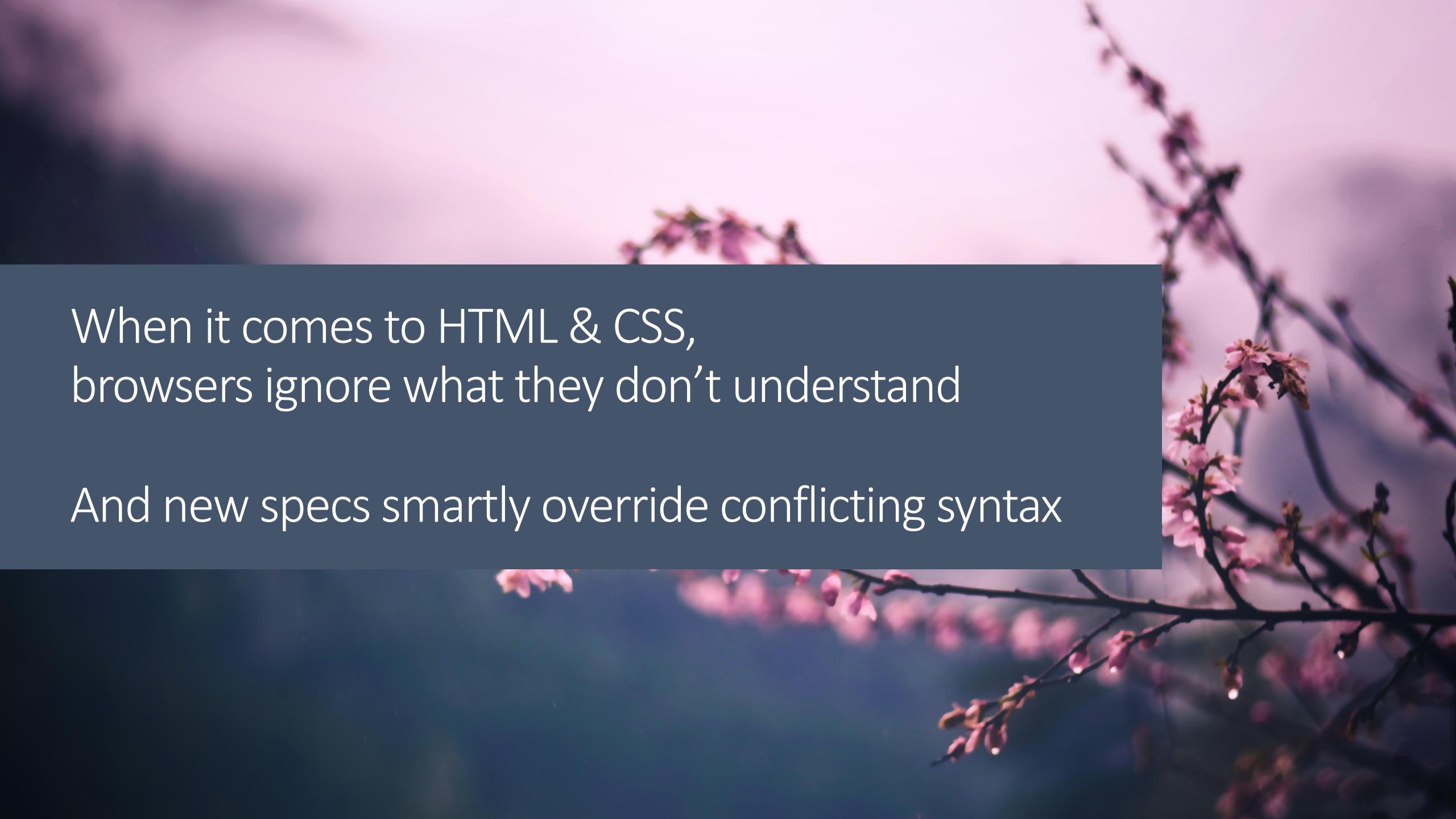
```
@supports (display: grid) {  
  p {  
    color: green;  
  }  
}
```

Passwords can be a hassle. Most people don't create strong passwords or make sure to maintain a different one for every site. People create easy-to-remember passwords and typically use the same passwords across all of their accounts.

Browsers that understand @supports and grid apply it



When it comes to HTML & CSS,
browsers ignore what they don't understand



When it comes to HTML & CSS,
browsers ignore what they don't understand

And new specs smartly override conflicting syntax

Enhance!



Basic, but ok!

ay!



Gridbyexample

Progressive Enhancement

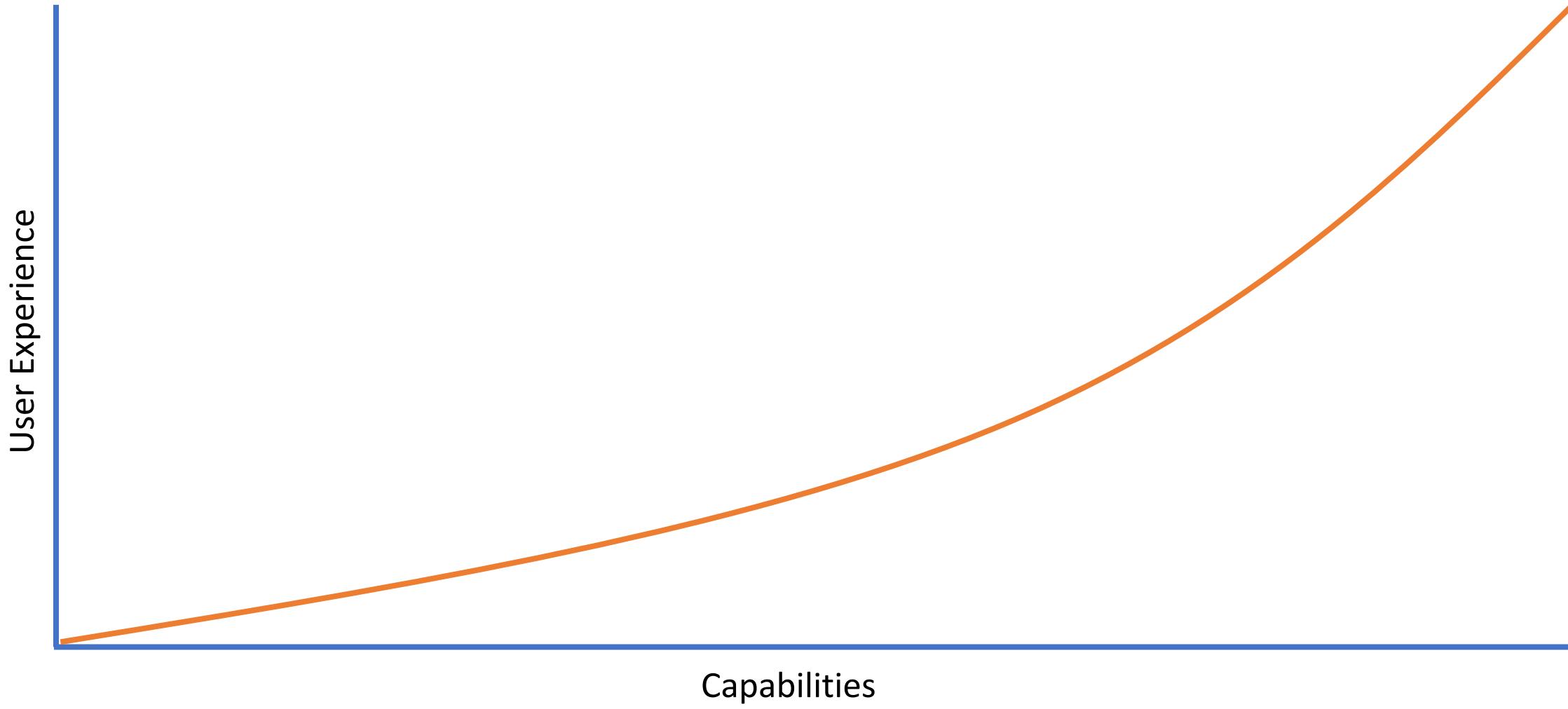
Grid Garden

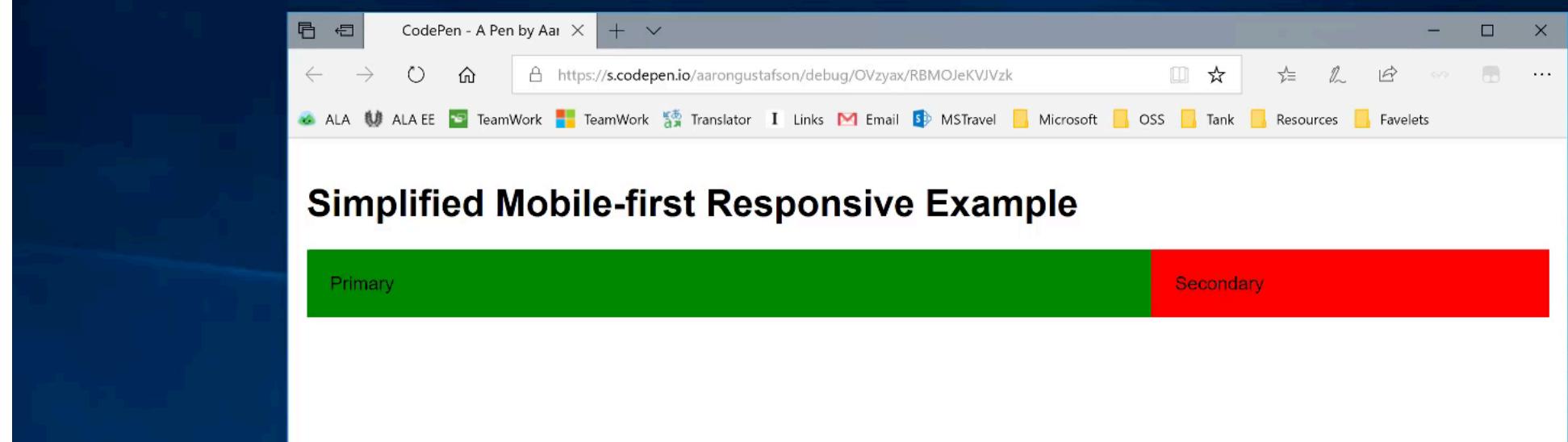
Progressive Enhancement Demo

Leverage the power of CSS Grid Layout!

Read [this article](#) for details on how to use CSS Grid Layout today.

Enhance the experience





“Mobile first” design



Recycle Bin

“Desktop first”

```
.primary {  
    float: left;  
    width: 68%;  
}  
.secondary {  
    float: right;  
    width: 32%;  
}  
@media (max-width:599px) {  
    .primary, .secondary {  
        float: none;  
        width: auto;  
    }  
}
```

“Desktop first”

```
.primary {  
    float: left;  
    width: 68%;  
}  
.secondary {  
    float: right;  
    width: 32%;  
}  
@media (max-width:599px) {  
    .primary, .secondary {  
        float: none;  
        width: auto;  
    }  
}
```

“Desktop first”

```
.primary {  
    float: left;  
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}  
.secondary {  
    float: right;  
    width: 32%;  
}  
@media (max-width:599px) {  
    .primary, .secondary {  
        float: none;  
        width: auto;  
    }  
}
```

```
@media (min-width:600px) {  
    .primary {  
        float: left;  
        width: 68%;  
    }  
    .secondary {  
        float: right;  
        width: 32%;  
    }  
}
```

“Mobile first”

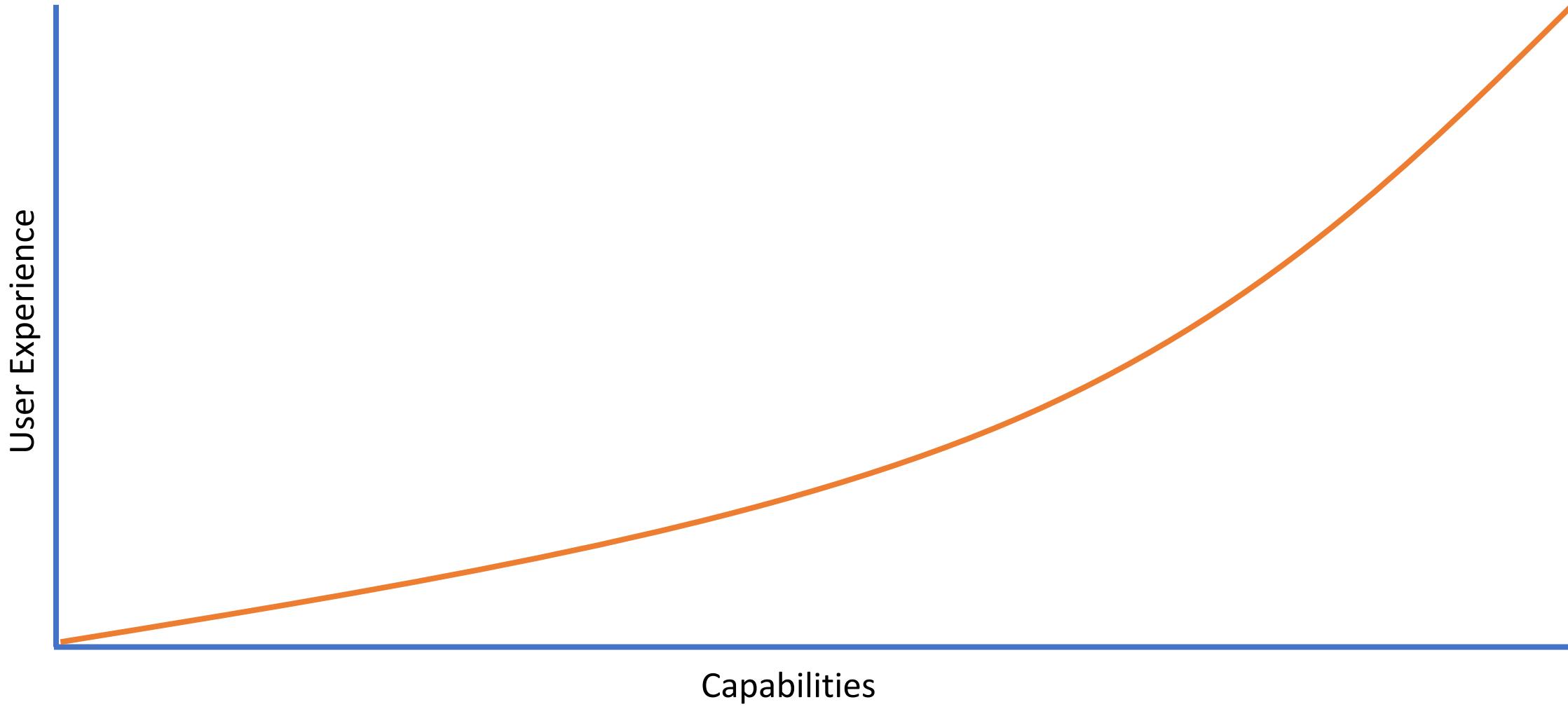
```
@media (min-width:600px) {  
    .primary {  
        float: left;  
        width: 68%;  
    }  
    .secondary {  
        float: right;  
        width: 32%;  
    }  
}
```

“Mobile first”

Other ways to design “mobile first”

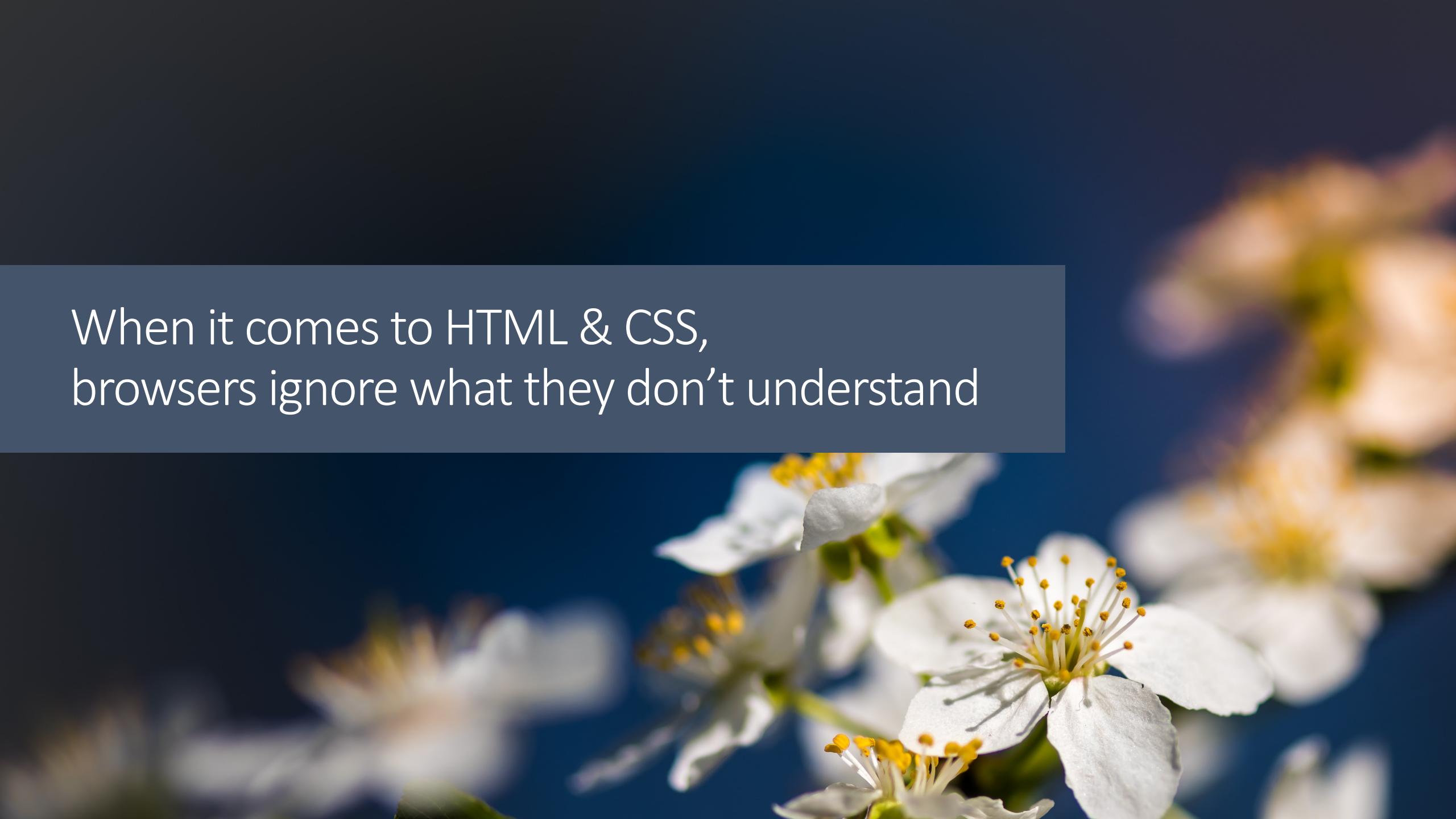
- ⌚ Selectively deliver advanced styles
- ⌚ Isolate large CSS images in min-width media queries
- ⌚ Don't hide content images using CSS
- ⌚ Use responsive images
- ⌚ Prefer system fonts
- ⌚ font-display: optional

Enhance the experience



Step 4

Improve the core experience with JavaScript

A close-up photograph of white cherry blossoms against a dark blue background. The flowers are in sharp focus in the foreground, showing their delicate petals and yellow stamens. The background is blurred, creating a bokeh effect with more flowers and leaves.

When it comes to HTML & CSS,
browsers ignore what they don't understand

The background of the slide features a close-up photograph of white cherry blossoms with yellow stamens, set against a dark blue gradient background.

When it comes to HTML & CSS,
browsers ignore what they don't understand

Sadly, that's not the case with JavaScript

What happens when a browser doesn't understand **let**?

```
document.body.innerHTML += '<p>Can I count to four?</p>';
```

```
for ( let i=1; i<=4; i++ )  
{  
  document.body.innerHTML += '<p>' + i + '</p>';  
}
```

```
document.body.innerHTML += '<p>Success!</p>';
```

Does your browser support `let`?

If it does, you should see some numbers in paragraphs, followed by a success message.

Can I count to four?

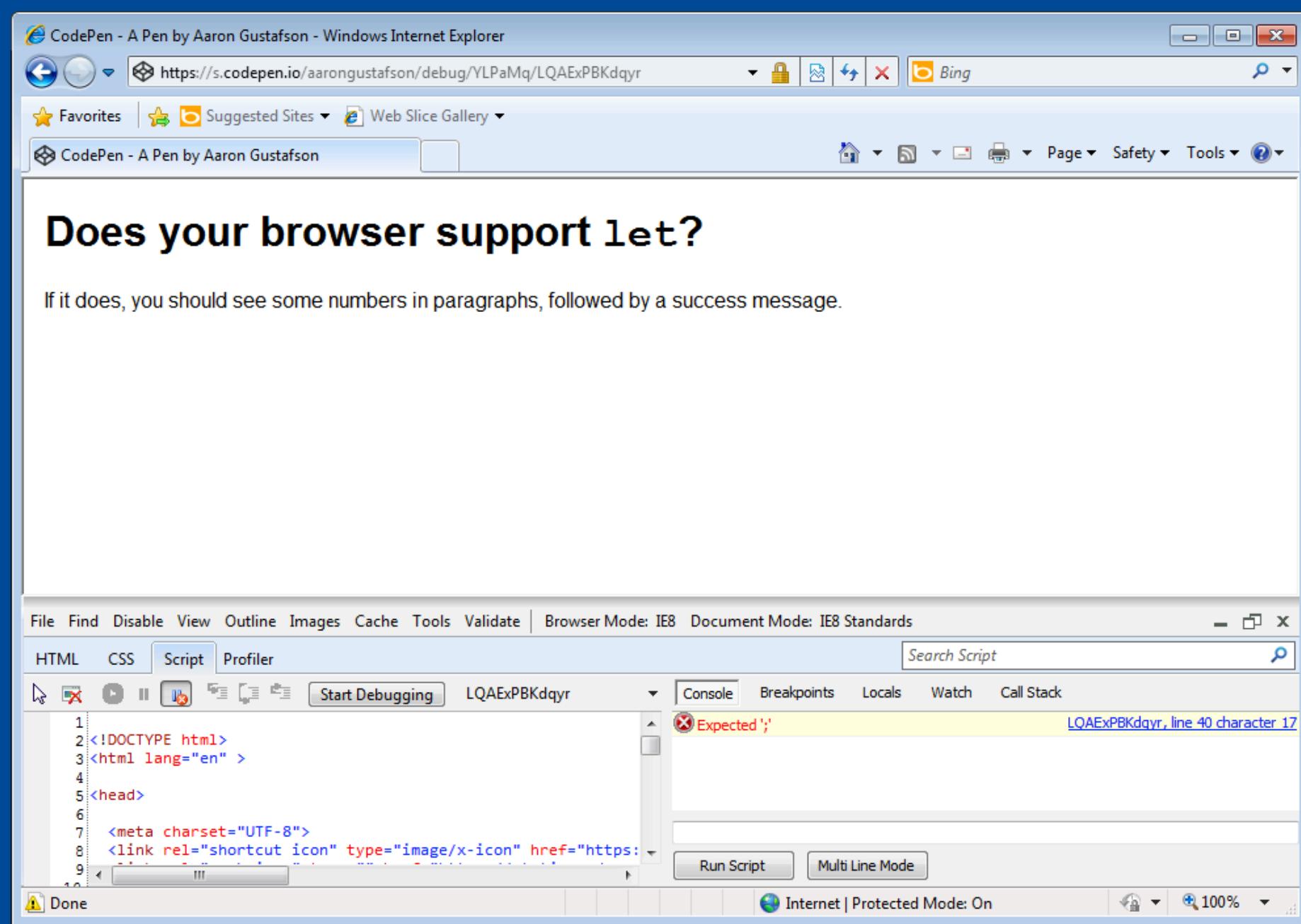
1

2

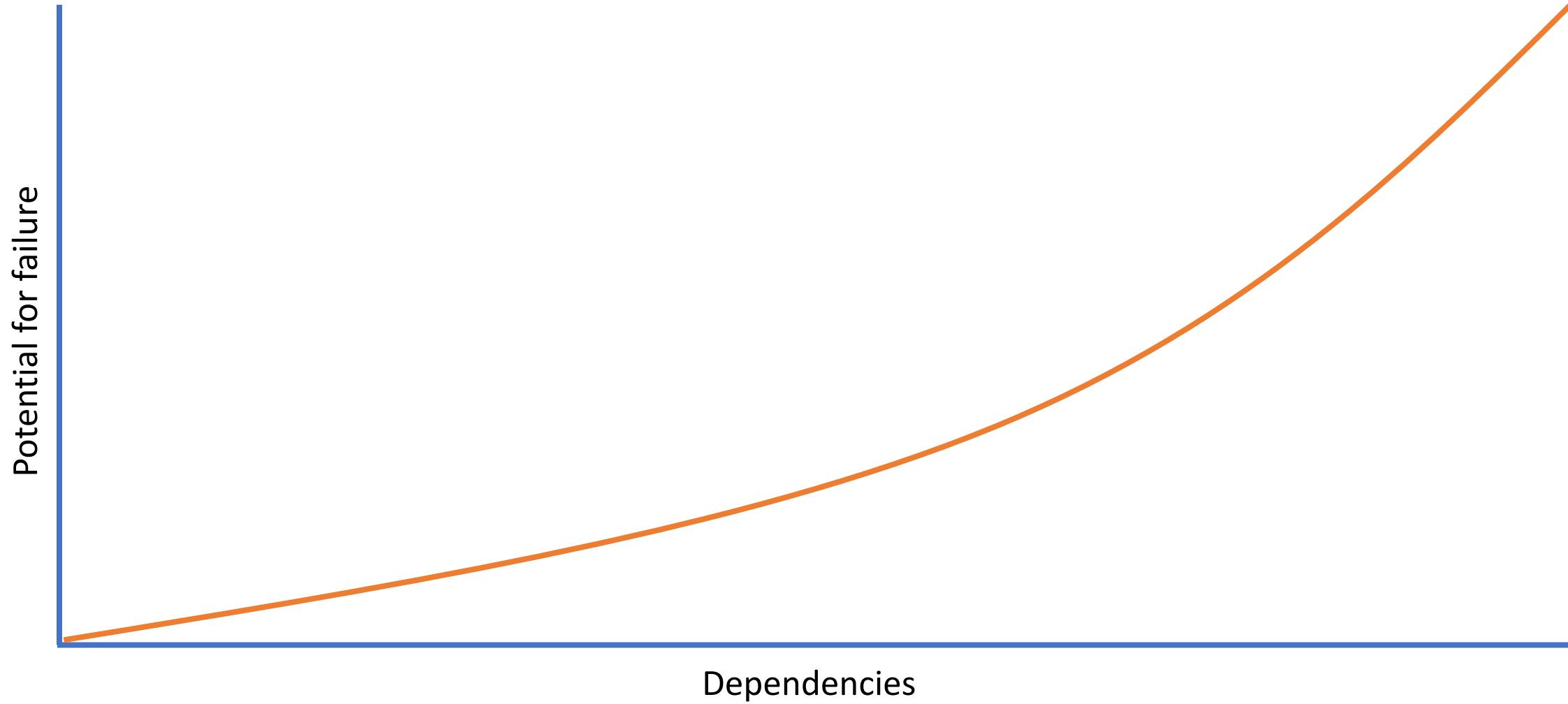
3

4

Success!



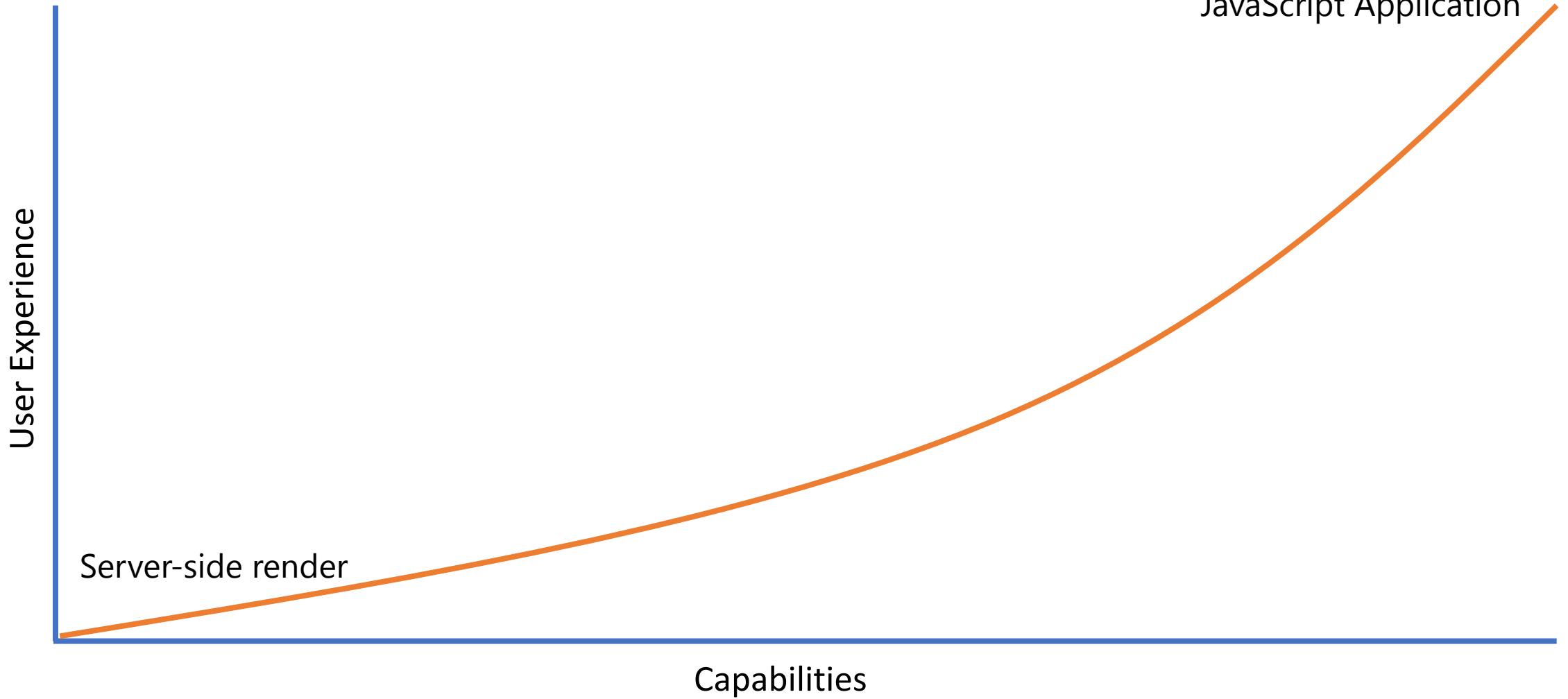
More dependencies, more (potential) problems



A close-up photograph of white cherry blossoms against a dark blue background. The flowers are in sharp focus in the foreground, showing their delicate petals and yellow stamens. The background is blurred, creating a bokeh effect with more flowers and leaves.

We can and should use JavaScript,
but thoughtfully & intentionally

Enhance the experience



Start X +

Search or enter web address

My Feed Politics US World Technology Entertainment Sports Money Lifestyle Autos Video powered by MSN

Analysts: Giuliani's media blitz gave investigators new leads
 The Washington Post

Weather Hawaii volcano erupts; county issues evacuation orders
 Associated Press

Seattle, Washington >

53°F Partly Cloudy
50.0%

Fri	Sat	Sun	Mon	Tue
60° 52°	67° 57°	71° 55°	70° 55°	74° 57°

Data from Foreca | Updated 14 mins ago

Money Why SF residents are freaking out after buying \$1M homes
 Business Insider

US Miami Cop Relieved Of Duty For Kicking Handcuffed Suspect...
 CBS Miami - LocalNewsRSS

Politics Ryan says chaplain will remain in his post
 The Washington Post

NBA >

May 3	103 - 108	PHI	BOS
FINAL	128 - 110	CLE	TOR
BOS leads 2-0	CLE leads 2-0	ESPN 8:00 PM ET May 4	NO

Data from Stats

Feedback

Detecting support

```
if ( navigator.credentials ) {  
    // Actual logic goes here  
}
```

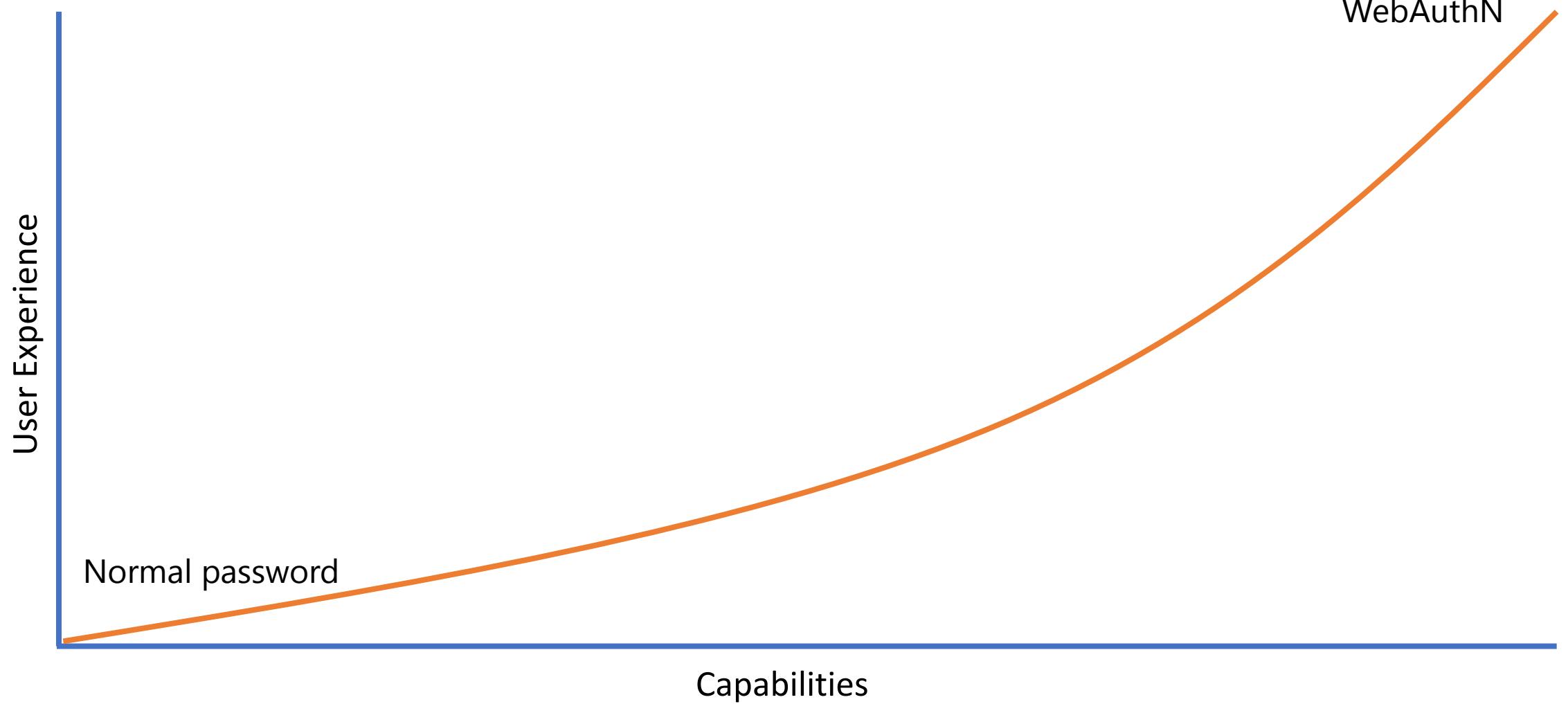
Creating the credential

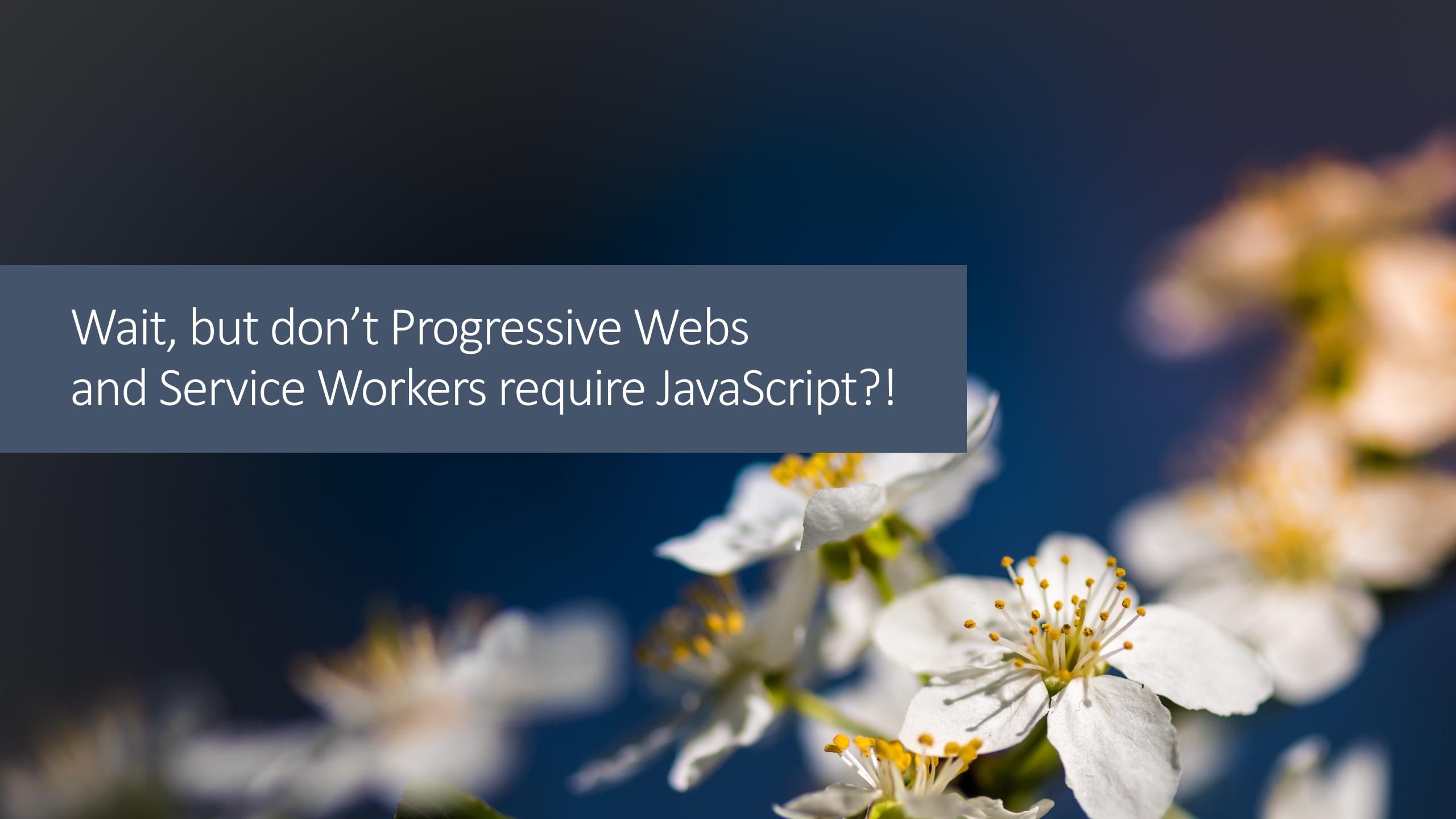
```
// Create a credential with WebAuthn APIs
navigator.credentials.create({
  publicKey: {
    rp: { /* relying party info */ },
    user: { /* user info */ },
    authenticatorSelection: {
      authenticatorAttachment: "platform"
    },
    pubKeyCredParams: [
      {
        type: "public-key",
        alg: -257 /* Accept RS256 credentials */
      }
    ],
    // and other required parameters such as challenge, timeout, ...
  }
}).then(attestation => {
  // Send the credential to your server, which decodes it and stores the public key
  sendToServer(attestation);
});
```

Verifying the credential later

```
// Next time the user visits the page, call the WebAuthn APIs
navigator.credentials.get({
  publicKey: {
    allowCredentials: [
      type: "public-key",
      id: credentialId // ID of credential(s) previously created
    ]
    // and other required parameters such as challenge, timeout, ...
  }
}).then(assertion => {
  // Send the assertion to your server, which decodes it and ensures the
  // contained signature matches the public key received at credential creation
  sendToServer(assertion);
});
```

Enhance the experience



A close-up photograph of white cherry blossoms against a dark blue background. The flowers are in sharp focus in the foreground, showing their delicate petals and yellow stamens. The background is blurred, creating a bokeh effect with more flowers visible.

Wait, but don't Progressive Webs
and Service Workers require JavaScript?!

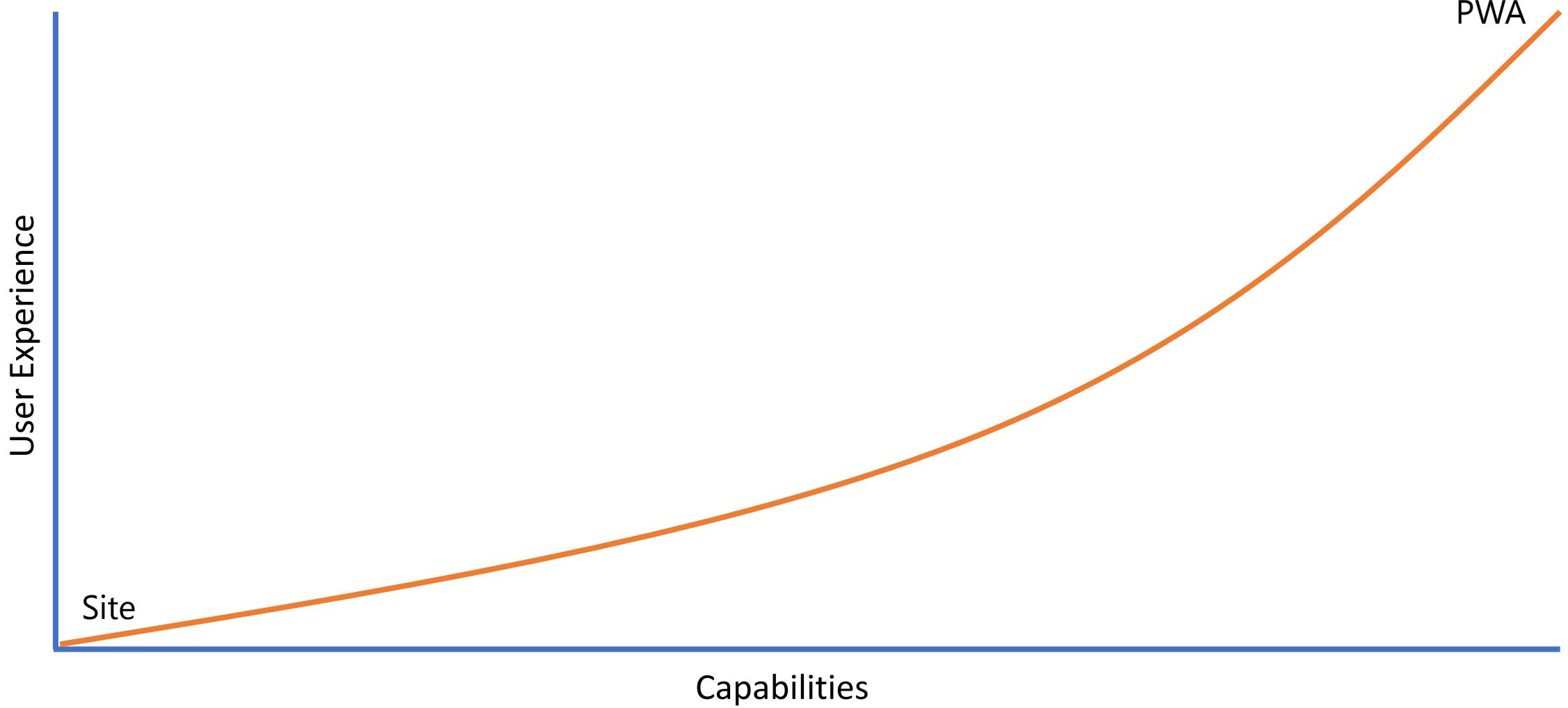
Registering a Service Worker

```
if ( navigator.serviceWorker ) {
  navigator.serviceWorker.register('/serviceworker.js')
    .then(function(registration) {
      console.log('Success!', registration.scope);
    })
    .catch(function(error) {
      console.error('Failure!', error);
    });
}
```

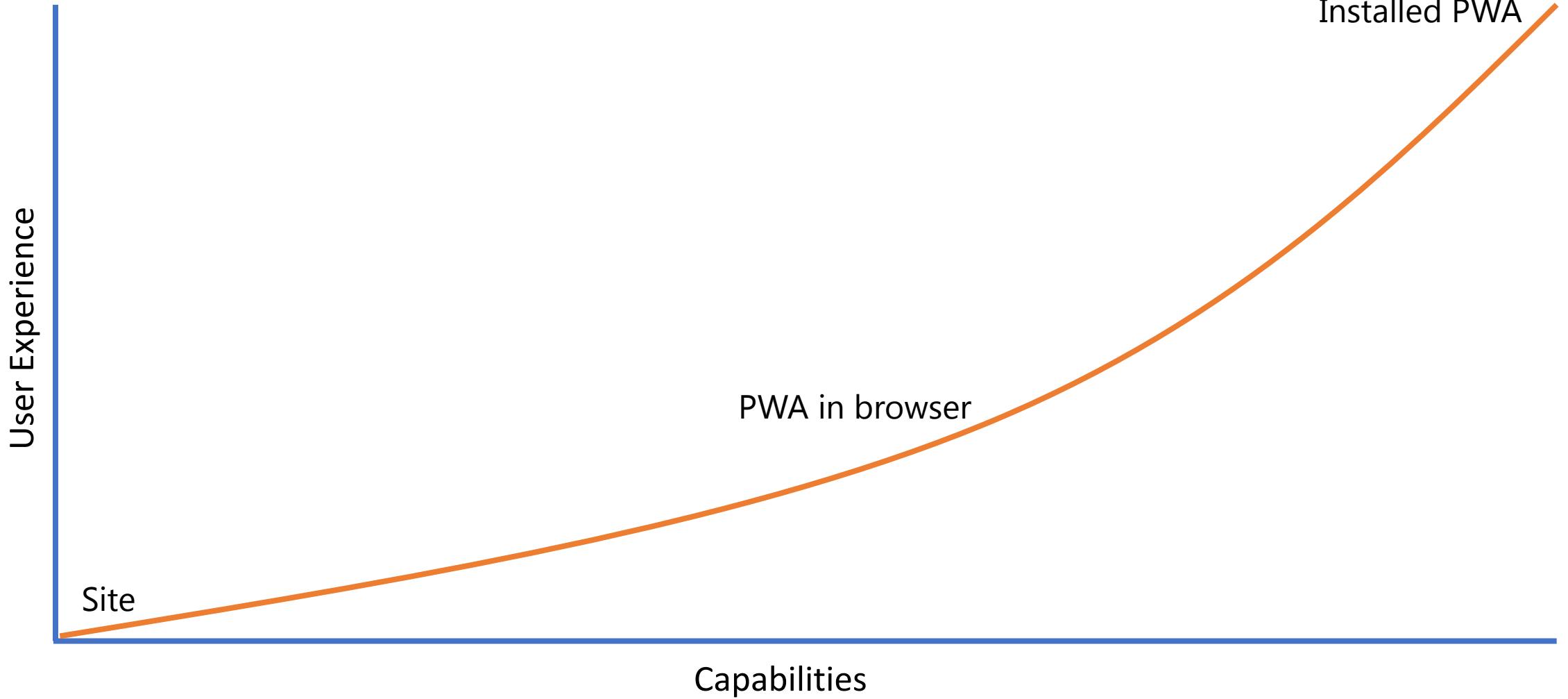
Object detection FTW!

```
if ( navigator.serviceWorker ) {  
  navigator.serviceWorker.register('/serviceworker.js')  
    .then(function(registration) {  
      console.log('Success!', registration.scope);  
    })  
    .catch(function(error) {  
      console.error('Failure!', error);  
    });  
}
```

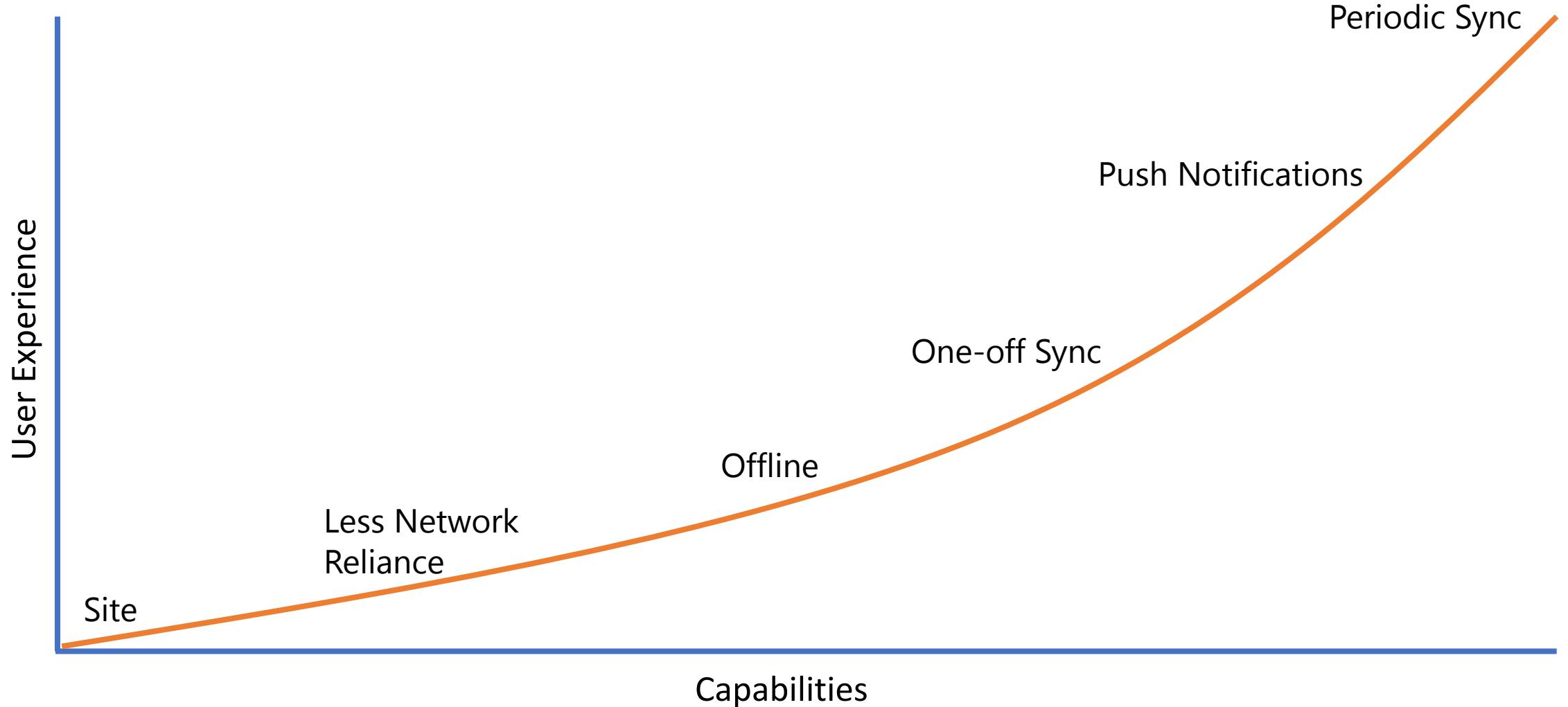
Enhance the experience



Enhance the experience



Enhance the Service Worker



Windows Settings

 Find a setting 

System

Display, sound, notifications,
power

Devices

Bluetooth, printers, mouse



Phone

Link your Android, iPhone



Personalization

Background, lock screen, colors



Apps

Uninstall, defaults, optional
features

Time & Language

Speech, region, date



Gaming

Game bar, DVR, broadcasting,
Game Mode

Cortana

Cortana language, permissions,
notifications

Privacy

Location, camera



Update & Security

Windows Update, recovery,
backup

Did you know PWAs can enhance via native APIs?



Recycle Bin

Detecting “dark mode”

```
if (window.Windows) {  
    var uiSettings = new Windows.UI  
        .ViewManagement  
        .UISettings();  
  
    var color = uiSettings  
        .getColorValue(  
            Windows.UI  
                .ViewManagement  
                .UIColorType  
                .background  
        );  
    if (color.r == 0 && color.g == 0  
        && color.b == 0) {  
        // changes for Dark Mode  
    }  
}
```

```
if (window.Windows) {  
    var uiSettings = new Windows.UI  
        .ViewManagement  
        .UISettings();  
  
    var color = uiSettings  
        .getColorValue(  
            Windows.UI  
                .ViewManagement  
                .UIColorType  
                .background  
        );  
    if (color.r == 0 && color.g == 0  
        && color.b == 0) {  
        // changes for Dark Mode  
    }  
}
```

Detecting “dark mode”

```
if (window.Windows) {  
    var uiSettings = new Windows.UI  
        .ViewManagement  
        .UISettings();  
  
    var color = uiSettings  
        .getColorValue(  
            Windows.UI  
                .ViewManagement  
                .UIColorType  
                .background  
        );  
    if (color.r == 0 && color.g == 0  
        && color.b == 0) {  
        // changes for Dark Mode  
    }  
}
```

Detecting “dark mode”

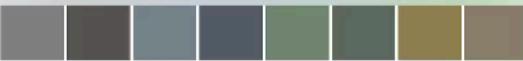
Detecting “dark mode”

```
if (window.Windows) {  
    var uiSettings = new Windows.UI  
        .ViewManagement  
        .UISettings();  
  
    var color = uiSettings  
        .getColorValue(  
            Windows.UI  
                .ViewManagement  
                .UIColorType  
                .background  
        );  
  
    if (color.r == 0 && color.g == 0  
        && color.b == 0) {  
        // changes for Dark Mode  
    }  
}
```

```
if (window.Windows) {  
    var uiSettings = new Windows.UI  
        .ViewManagement  
        .UISettings();  
  
    var color = uiSettings  
        .getColorValue(  
            Windows.UI  
                .ViewManagement  
                .UIColorType  
                .background  
        );  
    if (color.r == 0 && color.g == 0  
        && color.b == 0) {  
        // changes for Dark Mode  
    }  
}
```

Detecting “dark mode”

Colors



+ Custom color

More options

Transparency effects

On

Show accent color on the following surfaces

Start, taskbar, and action center

Title bars

Choose your default app mode

Light

Dark

Related Settings

[High contrast settings](#)

[Sync your settings](#)

Have a question?

[Get help](#)

Make Windows better

[Give feedback](#)

Testing PWA + Windows Dark Mode

This is a test to demonstrate how a PWA can respond to Windows' Dark Mode.

```
if ( window.Windows )
{
    var uiSettings = new Windows.UI.ViewManagement.UISettings();
    var color = uiSettings.getColorValue( Windows.UI.ViewManagement.UIColorType.background );
    if ( color.r == 0 && color.g == 0 && color.b == 0 )
    {
        // Dark mode
    }
    else
    {
        // Light mode (default)
    }
}
```

This is an installed PWA WinRT JS is already in the Cache Adding WinRT JS to the Page

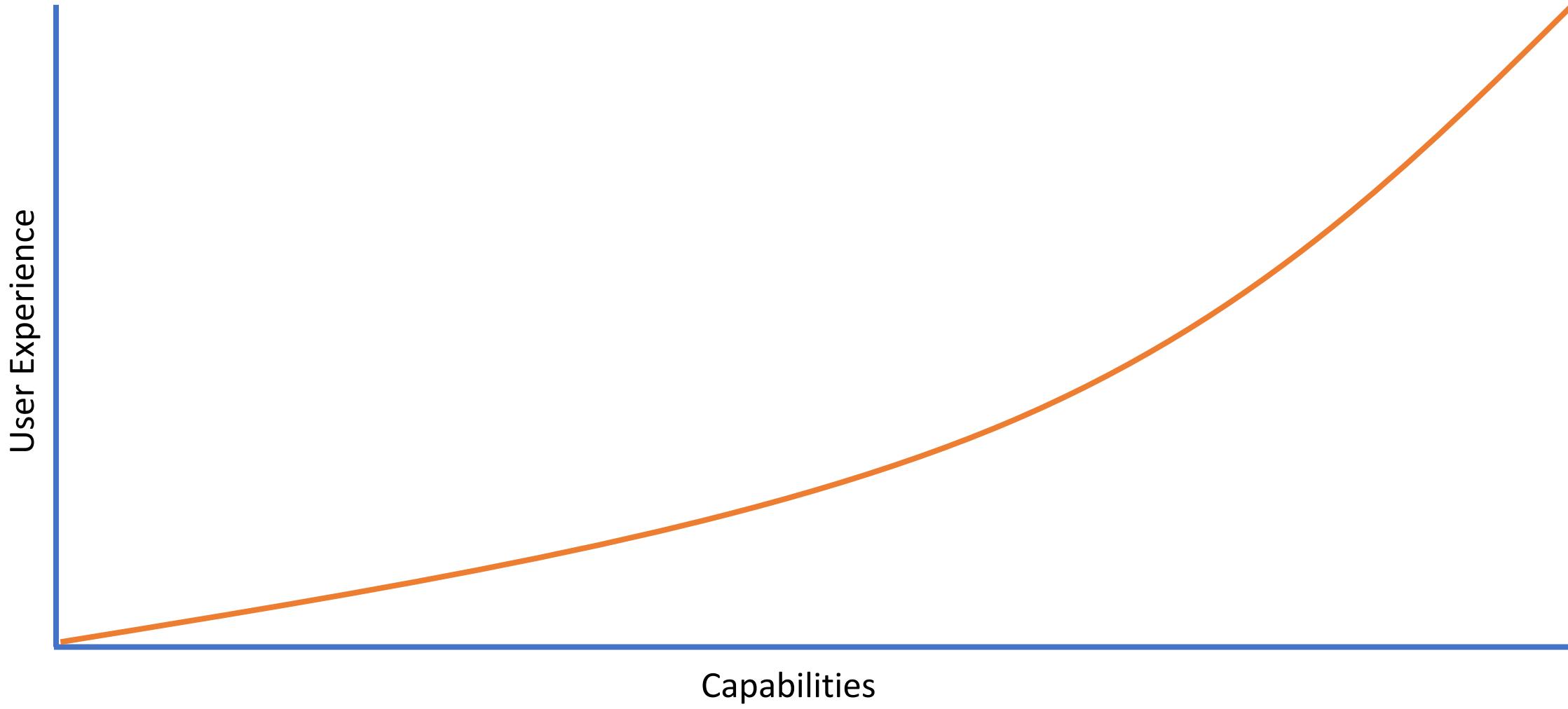


4:56 PM

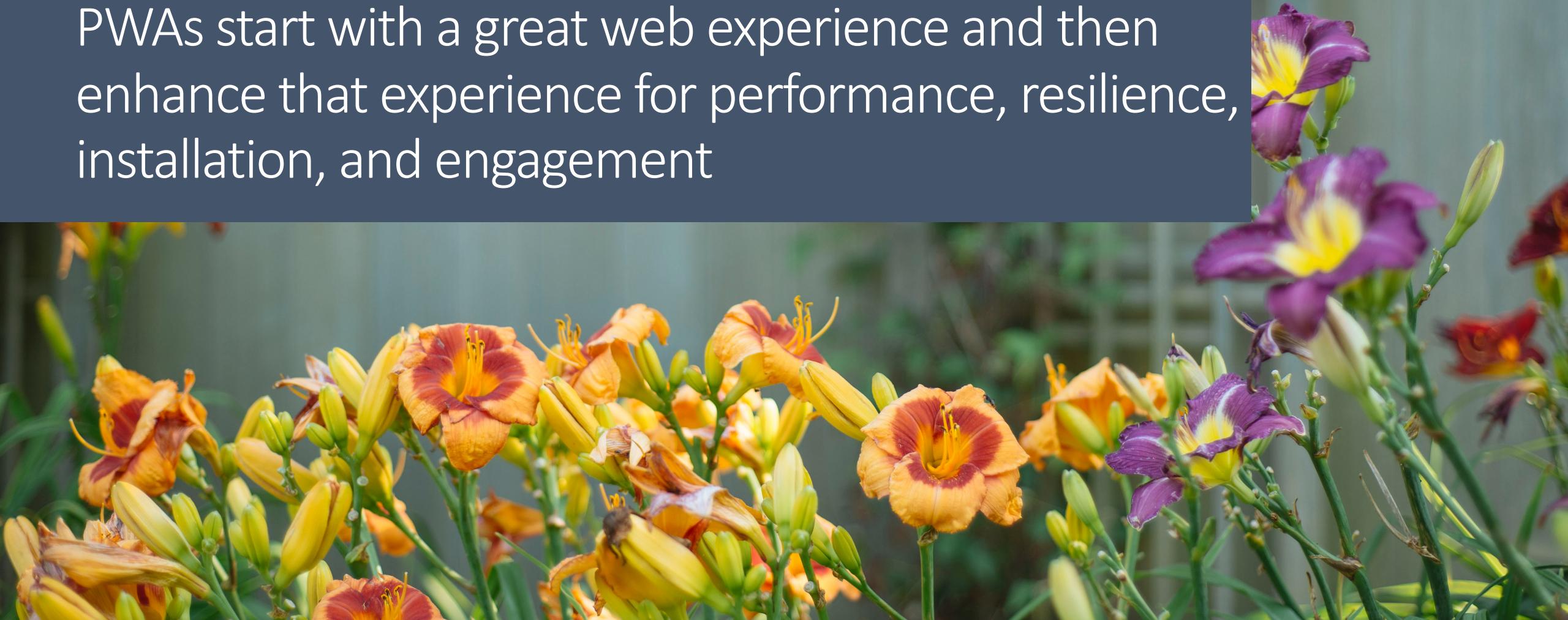
A close-up photograph of white cherry blossoms against a dark blue background. The flowers are in sharp focus in the foreground, showing their delicate petals and yellow stamens. The background is blurred, creating a bokeh effect with more flowers and leaves.

We can and should use JavaScript,
but thoughtfully & intentionally

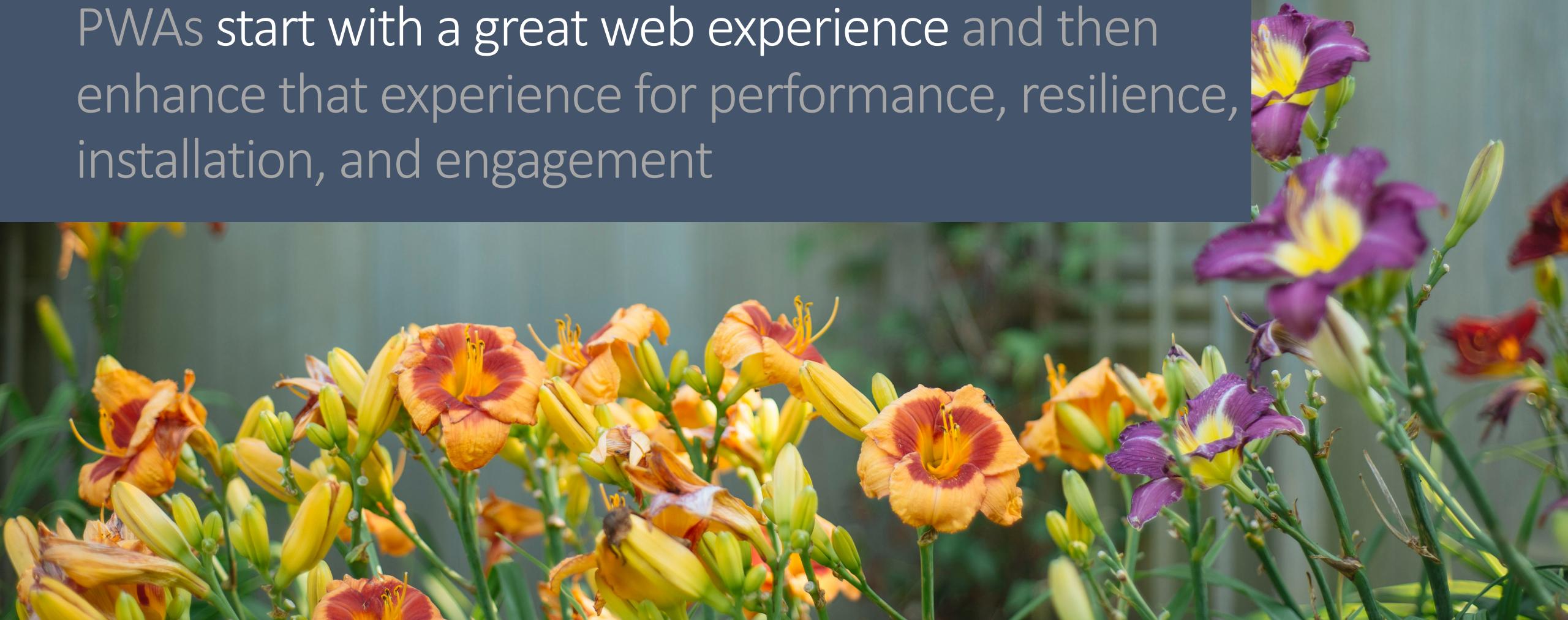
Enhance the experience



PWAs start with a great web experience and then enhance that experience for performance, resilience, installation, and engagement



PWAs start with a great web experience and then enhance that experience for performance, resilience, installation, and engagement





Focus
Design

Markup
JavaScript



Thank you.

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PWABuilder.com

