



HTML: the language of the web

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Web technology overview

1. HTTP: the language of web communication
2. **HTML** & web app design
3. **JavaScript**: interactions in the browser
4. **Node.js**: JavaScript on the server
5. **CSS**: adding style
6. Node.js: advanced topics
7. Cookies & sessions
8. Web security

Learning goals

- **Apply** Web design principles during the design stage of a Web app.
- **Explain** the ideas behind usability testing and **employ** it
- **Employ** HTML5 to create web pages.

Web sites vs. Web applications

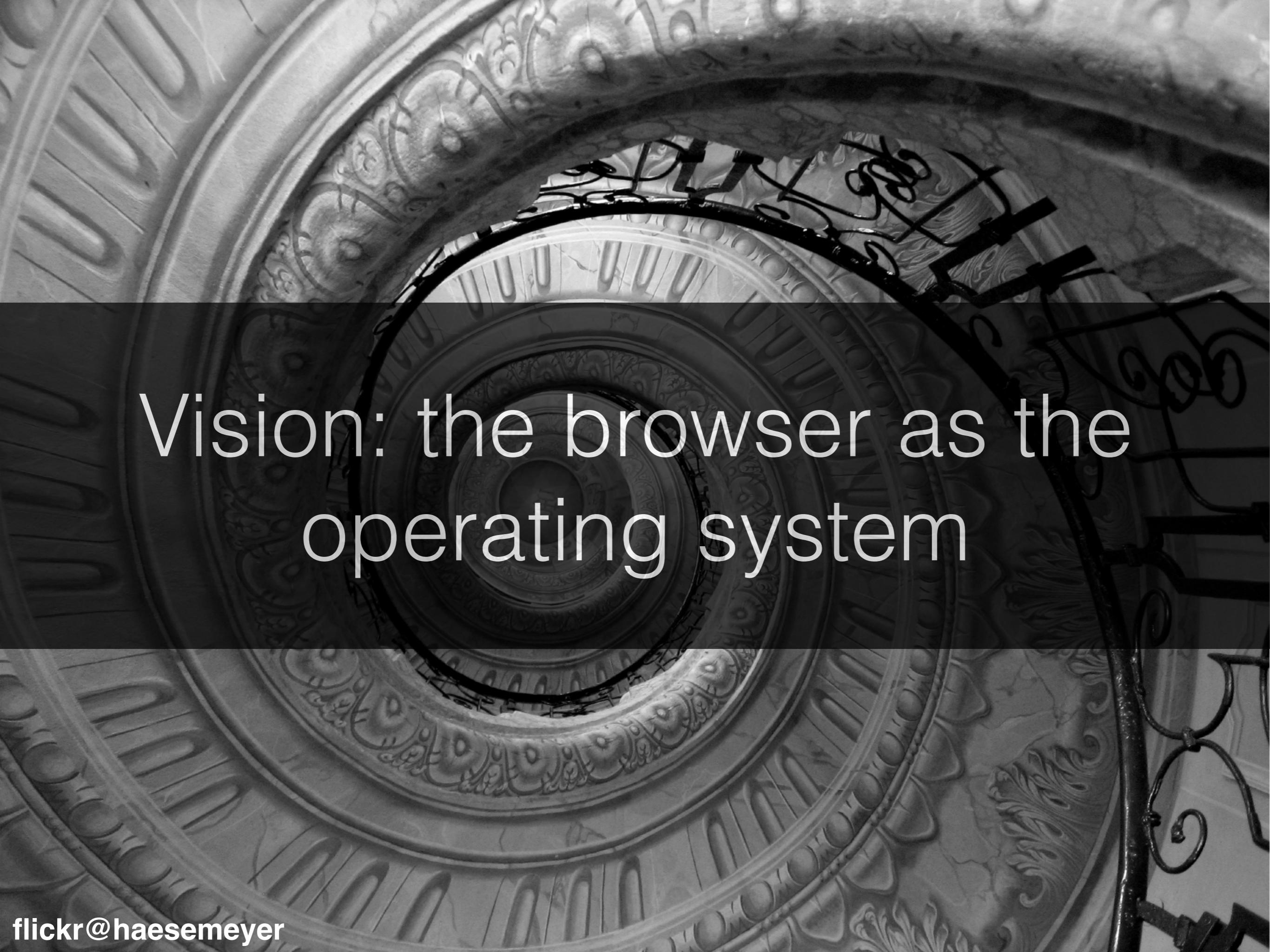
>10 million lines of code

“As Web browsers and the Web engine components that power them become ubiquitous [...], developers are increasingly **using Web technologies** to build **applications** and are relying on Web engines as **application runtime environments**.

Examples of applications now commonly built using Web technologies include [...] **games, multimedia applications, maps ...**”

W3C: Web Applications Working Group

Since 2017: Web Platform Working Group.

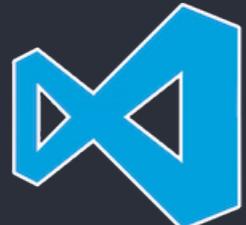


Vision: the browser as the
operating system

Not just for the Web: ELECTRON



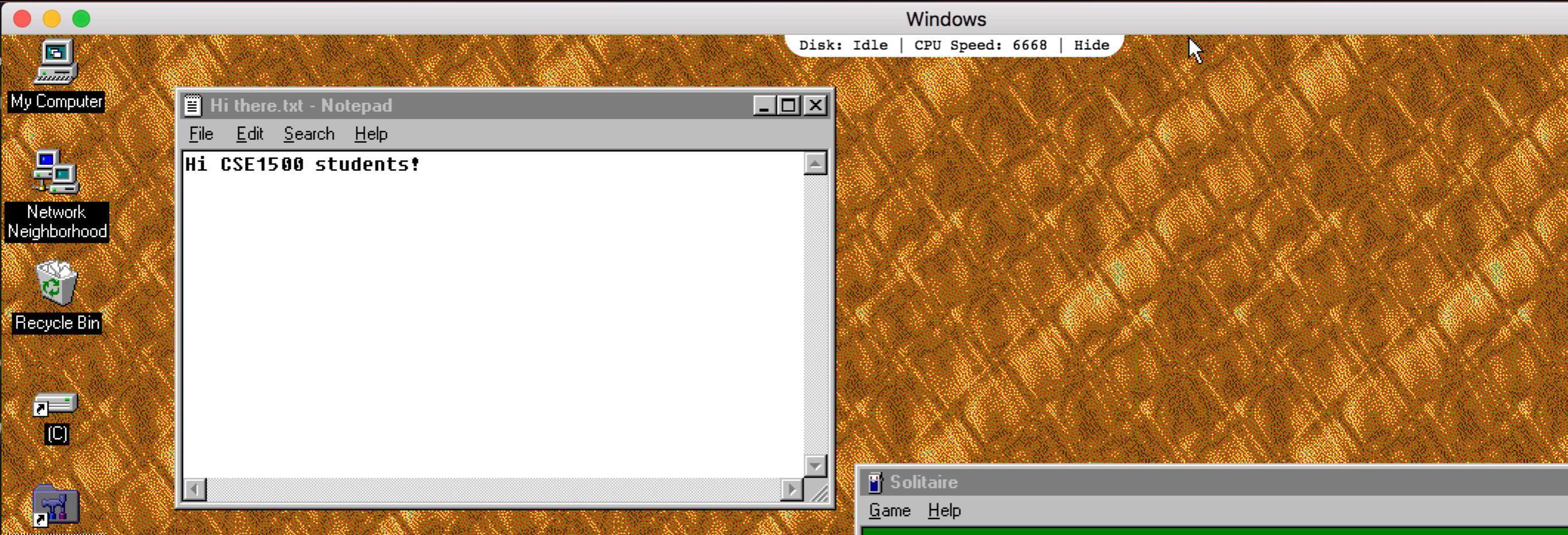
Build cross platform desktop apps
with JavaScript, HTML, and CSS



Windows

Disk: Idle | CPU Speed: 6668 | Hide





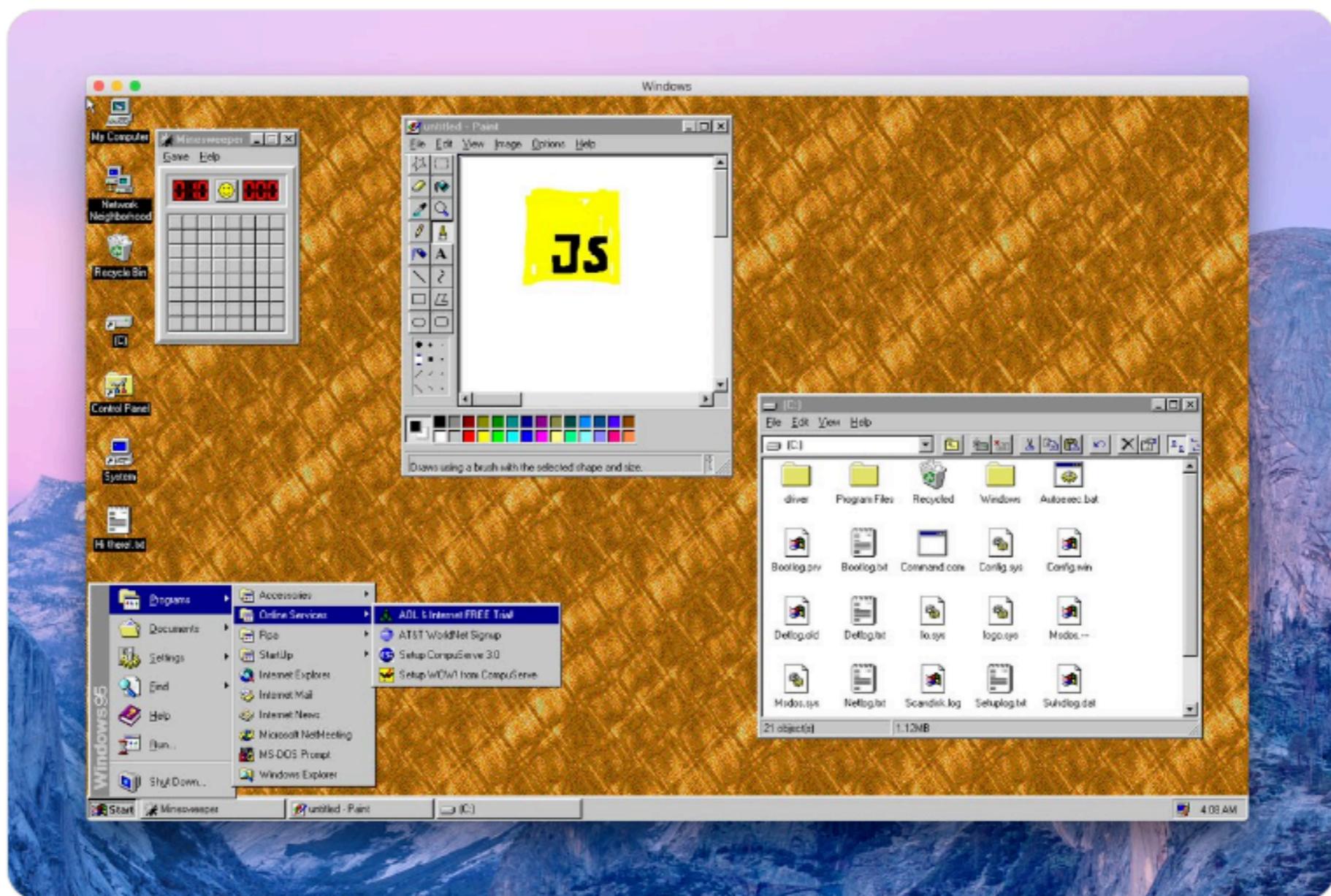
- Positive: a **single application** for different operating systems.
- Negative: **overhead** (every application bundles Chromium).
- Concretely: Windows 95 requires 40 MB disk space, the unzipped Electron app is > 400 MB.



Felix Rieseberg @felixrieseberg · Aug 23

I put **Windows 95** into an **Electron** app that now runs on macOS, Windows, and Linux. It's a terrible idea that works shockingly well. I'm so sorry.

Go grab it here: [github.com/felixrieseberg...](https://github.com/felixrieseberg/windows95)



630



7.5K



20K



Show this thread

Web design basics

Disclaimer

- Web design is **not trivial**
- **But:** a few rules go a long way
- Most **basic principles** seem obvious, but are often ignored

Steve Krug



DON'T
MAKE
ME
THINK
revisited

and Mobile
A Common Sense Approach to Web Usability

Rule#1: don't make me think

- How a web site/app “works”, should be self-evident
- Users’ **cognitive effort** should be **minimal**

The screenshot shows the eBay homepage with a clean, user-friendly interface. At the top, there's a search bar with the placeholder "Search for anything" and a "Search" button. Below the search bar is a navigation menu with links to Home, Saved, Motors, Fashion, Electronics, Collectibles & Art, Home & Garden, Sporting Goods, Toys, Business & Industrial, Music, Deals, and Under \$10. A "Shop by category" dropdown is also present. The main banner features a large orange background with the text "Shoppers Want What You Have" and a subtext "Put your items in front of millions of people." It includes a "Sell Now" button and images of a leather jacket, headphones, and a magazine cover for Bruce Springsteen. Below the banner, a section titled "All About Your Fall Look" displays seven circular thumbnails representing different product categories: Women's Clothing (denim jacket), Women's Shoes (white boot), Accessories (clutch bag), Beauty (makeup palette), Jewelry & Watches (watch), Men's Clothing (plaid shirt), and Men's Shoes (maroon sneakers). Each thumbnail has its category name written below it.

ebay Shop by category ▾

Search for anything

All Categories

Advanced

Search

Home Saved Motors Fashion Electronics Collectibles & Art Home & Garden Sporting Goods Toys Business & Industrial Music Deals Under \$10

Shoppers Want What You Have

Put your items in front of millions of people.

Sell Now →

SPRINGSTEEN THE BOTTOM LINE-AUG. 13-17

All About Your Fall Look

Women's Clothing

Women's Shoes

Accessories

Beauty

Jewelry & Watches

Men's Clothing

Men's Shoes



WELKOM!

KIES HIER JE KOOPPLEIN

De gratis marktplaats in je eigen gemeente



Nederland

Je postcode:

Of woonplaats:

Of

Beginletter gemeente:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Nieuws

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[Lees verder »](#)





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Meer dan 360.000 tweedehands producten in je eigen woonplaats of heel Nederland.

Woonplaats of postcode

Zoek product of dienst

Zoeken

Plaats hier je gratis advertentie

Wil je snel iets verkopen? Plaats dan eenvoudig en **gratis** een advertentie op Koopplein.nl.

[Plaats advertentie](#)

Alle aanbiedingen in Nederland

Hieronder een greep uit ons aanbod uit heel Nederland. Kies je woonplaats om lokaal aanbod te kunnen zien.



Zuivere sinusomvormers mé...

Caravans, Campers en Kamperen >
Accessoires en Toebehoren

KENMERKEN:

- Co...

n.o.t.k.



Wit Luipaard booktype cov...

Telecommunicatie > Mobiele telefoons
en Smartphones > Hoesjes en
Frontjes...

€ 14,95

Rule#1: don't make me think

- Name links, buttons, sections, etc. **clearly, not cleverly**



- **Adhere** to established style standards

this is a link in 1999 is this a link?

- Avoid users getting lost within the web site; tell users where they are and how they arrived (leave “**breadcrumbs**”)

[Back to search results](#) | Listed in category: [Toys & Hobbies](#) > [Games](#) > [Chess](#) > [Vintage Chess](#)

- Clearly **divide** the different parts of a site (e.g. advertisements vs. content)



All

Images

News

Shopping

Maps

More

Settings

Tools

About 308.000.000 results (0,59 seconds)

November 2018

[Toyota.nl | Toyota Nederland | De officiële website](#)**Ad** www.toyota.nl/ ▾

Van compacte stadsauto tot SL **Google**
 modellen van Toyota online. H
 voor alles. Always a Better Way **Search**

Toyota

About 640,000,000 results

[New Car Deals | Local](#)<https://www.toyota.com/local>

Find out about the latest new car deals.

Web

Images

Videos

News

Shopping

More

Show search tools

[Toyota Deals | New Toyota](#)<https://www.toyota.com/deals>

From Toyota incentives like Cash for your next car, truck, SUV & more. Fi

Ads

[Toyota.com - New Toyota Incentives](#)www.toyota.com/Deals

Request a Quote, Explore Incentives at the Nationwide Clearance Event.

[Local Specials](#) [Locate a Dealer](#)
[Build & Price](#) [Request a Quote](#)
[2013 Toyota - New Toyota Is Here](#)shop.autonationtoyotanortharlington.com/

Browse And Get Our Internet Price.

[Toyota 1/2 Toyota - JeffHunterToyota.com](#)www.jeffhuntertoyota.com/

Find Photos, Specs & More Options Online. Find an Authorized Dealer!

[Toyota Cars, Trucks, SUVs & Hybrids | Toyota Official Site.](#)www.toyota.com/ - Cached - Similar

Explore the newest Toyota trucks, cars, SUVs, hybrids and minivans. See photos, compare models, get tips, calculate payments, and more.

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 Narrow current Toyota models down by ...[Rav4](#)

The Toyota RAV4 crossover SUV features and prices. See the 2013 ...

[Find a Toyota Dealer](#)Finding a Toyota dealership is easy.
 Our dealer locator provides the most ...[Toyota Tacoma Truck 2013](#)

Check out the 2013 Tacoma pick-up trucks and you'll find it's tough outside and tough to ... Tacoma is one truck that doesn't need a break to get the job done .

[Build](#)

Build a custom Toyota vehicle package. Choose the model, select the engine, ...

[Prius](#)

2013 Prius Photo Gallery - Toyota Prius C - Toyota Prius Hybrid - ...

August 2013

Ads

[Toyota Dallas](#)www.cowboytoyota.com/

Wide Selection of New Toyotas. Multiple Models. Shop Now. Dallas.

[2013 Toyota Clearance](#)toyota-clearance-sale.autosite.com/

Massive August Toyota Sale Now! Get Our Lowest Toyota Price & Save

[Toyota](#)www.freemantoyota.com/

2012 Tundra On Our Lot Now. Call Us For Info and Visit Today.

[2013 1/2 Toyota Closeout](#)www.toyota.car.com/

Special Aug. 2013 Toyota Discounts! Be Smart, Get Deals & Pay Less

More results from toyota.com 1/2/2

Rule#2: minimize noise & clutter

Cameras | Reviews | Shop | Business | Help | News | Handhelds | Desktops | Notebooks | Downloads | Developer

ZDNet
Where Technology Takes You

• Free Downloads
• Desktop Best Buys
• Digital Audio Rocks

Click Here!

Free Downloads • Product Reviews • Buying Guides • Faster Downloads • Free Updates • Hi-Tech Jobs
Smart Shopping • Domain Names • Top Notebooks • IT Resources • PC Check-Up • ZDNet onebox

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▶ Double talk among Apple dealers
▶ New rules favor Bells, threaten ISPs
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▶ Yahoo cuts off porn sales
▶ Computer junk: It's piling up
▶ AnchorDesk: How to find secret Easter eggs--in your computer programs
▶ More news headlines...

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Hot hard drives here
Looking for a hard drive? Meet ZDNet's five most popular picks and find a favorite of your own.
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Read review | Check prices
2. Maxtor DiamondMax 40
Read review | Check prices
3. Western Digital 30GB
Check prices
4. Maxtor DiamondMax 60
Read review | Check prices
5. IBM Deskstar 75GB
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▶ More product reviews...

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Check it out at ZDNet Reviews

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MyZDNet
E-Mail, SiteBuilder, Calendar, Discussions, ZDNet Rewards...

ZDNet TODAY ON ZDNET
Ten tax software bugs to watch out for
Tax software is supposed to save you time and stress when you do your taxes. We show you the bugs that stand in your way and how to fix them. Get details at ZDNet Help & How-To



14.04.2001

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14.10.2014

Rule#3: If you cannot make it self-evident, make it self-explanatory

- Self-explanatory sites require users to expend a **small** amount of cognitive effort
- A **small** amount of explanatory text can go a long way
- Keep the **mobile user** in mind (scrolling is expensive)
- **Avoid “happy talk”** - text without any content for the sake of adding text (e.g. welcome message)

Rule#3: If you cannot make it self-evident, make it self-explanatory

- Self-explanatory sites require users to expend a **small** amount of cognitive effort



Create Surveys. Get Answers.

Start Today

Pro Sign Up ▶

Unlimited Surveys & Responses

Sign Up FREE ▶

Just the Basics

Design
Build your own surveys or choose from our templates.

Collect
Choose how to distribute and start collecting responses.

Analyze
Use our powerful analytical tools for intelligent insights.

```
graph LR; Design[Design] --> Collect[Collect]; Collect --> Analyze[Analyze]
```

December 2013

EXPECTATIONS

VS.

REALITY

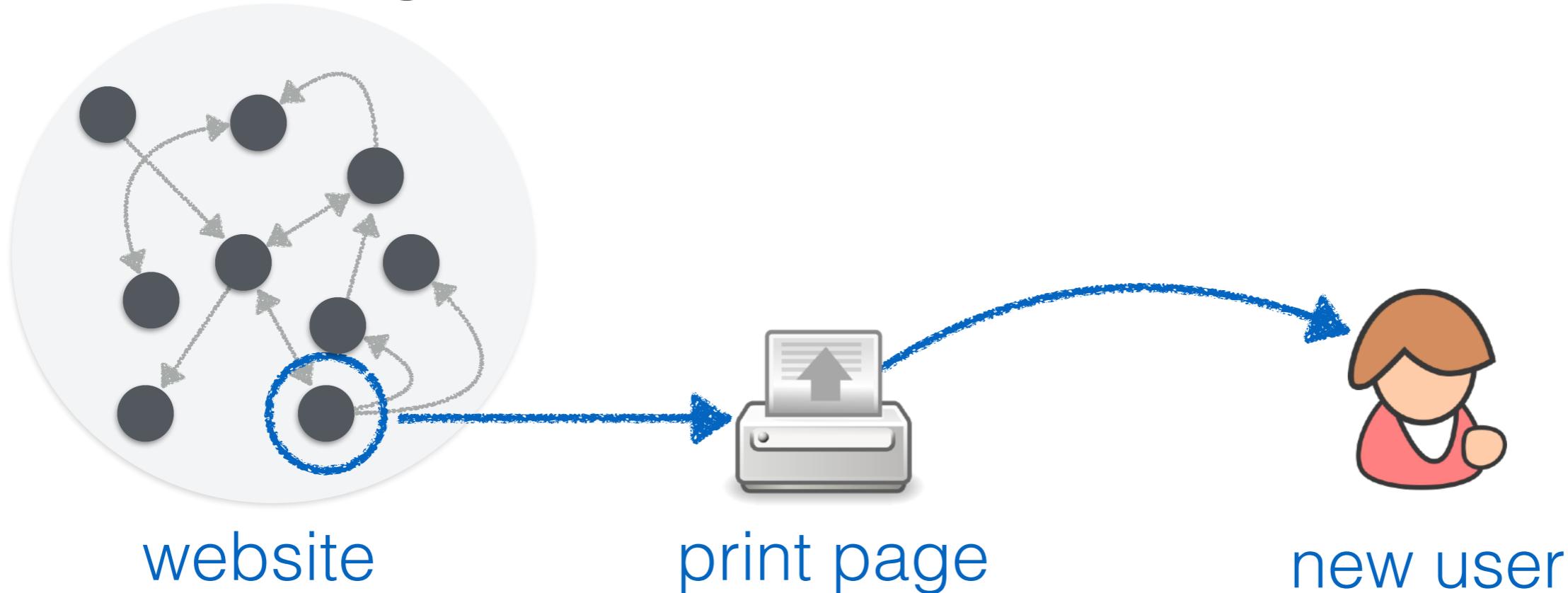
Idea: Web users are **rational, attentive** with a **clear goal** in mind

Reality: Web users ...

- quickly **scan** (not read!) a Web page
- decide **within seconds** whether or not a site is worth it
- click on the **first link** that looks reasonable
- depend a lot on the browser's **back button**
- do **not read instructions**

A Web site's design should be based on **user reality!**
Usability testing is important to make a site a success.

Site navigation: the “trunk test”

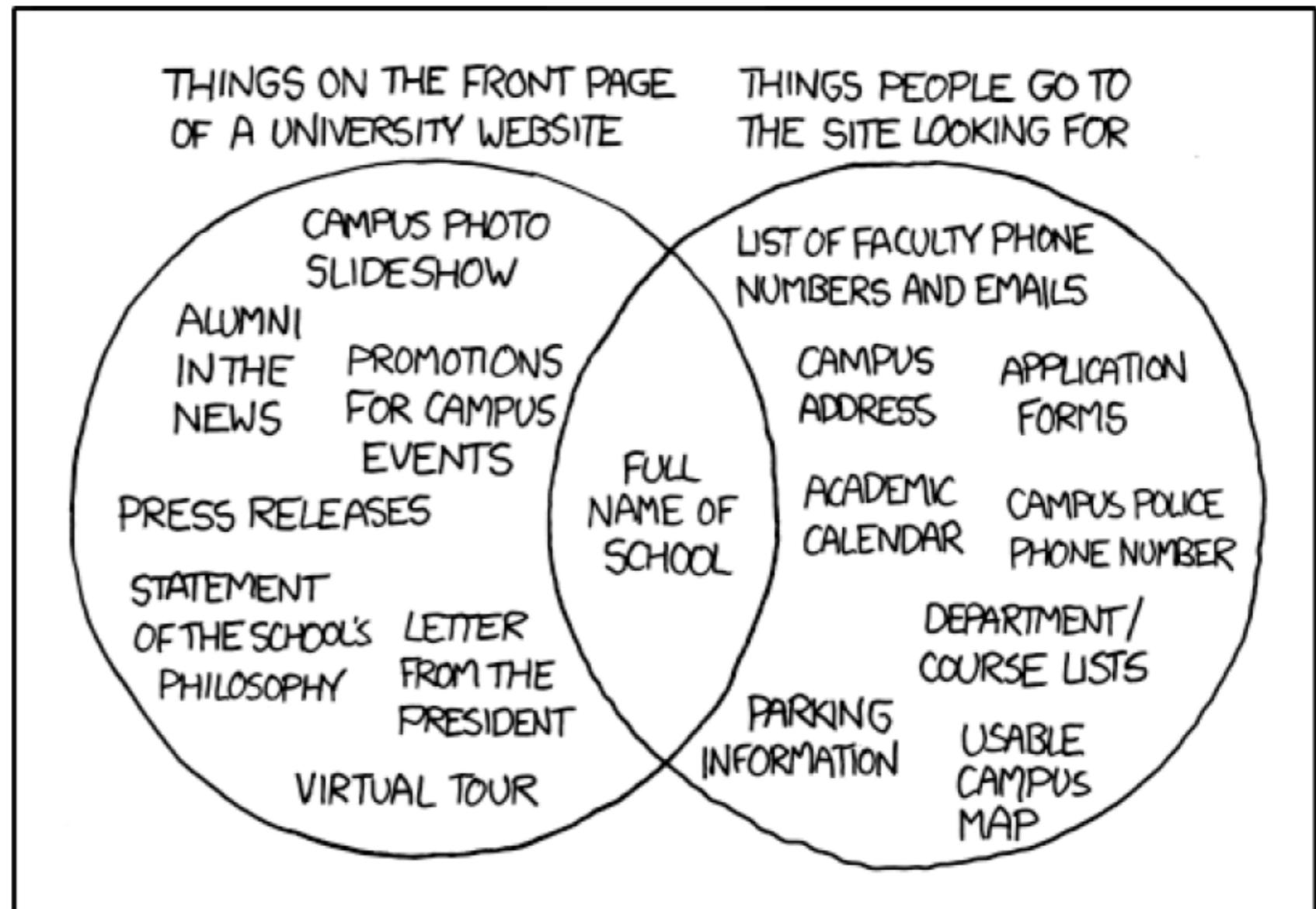


As quickly as possible the user should circle:

- **Name** of the Web site
- **Name** of the page he currently views
- **Major sections** of the page
- Possible **navigation options** at this point
- **“You are here”** indicators

The home page: the point of entry for most users

1. What **is** this?
2. What can I **do** here?
3. Why **should** I be here?
4. What do they **have** here?

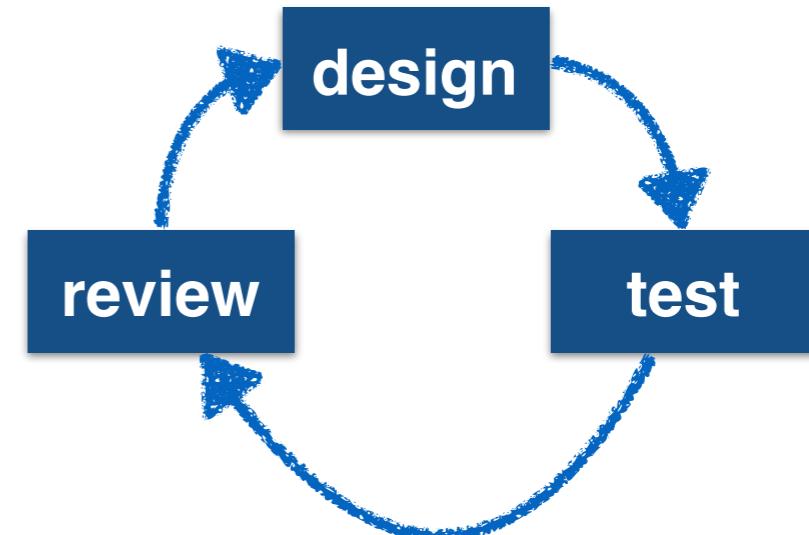


essential questions
to answer

<http://xkcd.com/773/>

Rule#4: test often and early

- **Usability test:** give a user a **typical task** and observe her



- Testers should be a mix of **target audience** and average Web users; **2-3 testers** per iteration are enough

Setup:

- + **Participant** (tester) sits in front of a device
- + **Facilitator** sits next to her and acts as guide
- + **Observers** (developers, managers, etc.) watch and learn

<http://bit.ly/1jLXwUy>



Participant & facilitator

<http://bit.ly/1jLXwUy>



What can you test?

- How to **create** a user account
- How to **retrieve** a lost password
- How to **change** the credit card information
- How to **delete** a user account
- How to **find** an article in the archive
- How to **edit** a posting made on the forum
-

Usability testing: the aftermath

- Assign each found problem to a **priority** (low, medium, high)
- Focus on the **high priority** problems
- Create an ordered list of high priority problems and **start fixing** the most severe one
- **Do not add** new problems to the list until you fixed everything

HTML5: let's take a closer look

HTML5 overview

- A set of related technologies that together enable **rich Web content**
 - **Core HTML5**: mark up content
 - **CSS**: control the appearance of marked-up content
 - **JavaScript**: manipulate the contents of HTML documents & respond to user interactions
- **Modern Web (app) development** requires knowledge of all three technologies
- Before HTML5: XHTML and HTML 4.01

Not all browsers support all features: <https://caniuse.com/>

HTML5 overview

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html
    PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
    <head>
        <title>Virtual Library</title>
    </head>
    <body>
        <p>Moved to <a href="http://example.org/">example.org</a>.</p>
    </body>
</html>
```

- Before HTML5: **XHTML** and HTML 4.01

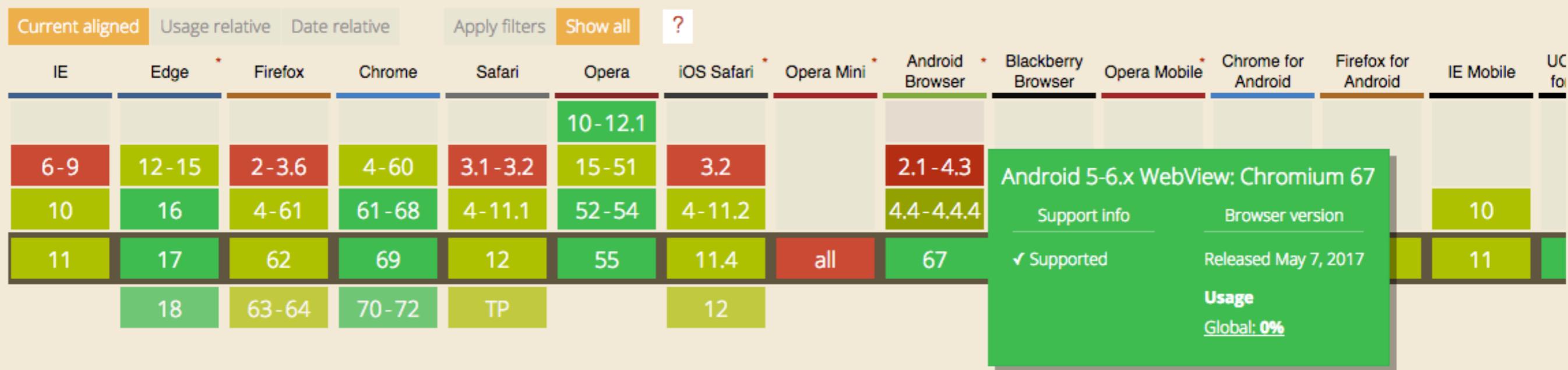
Not all browsers support all features: <https://caniuse.com/>

HTML5 overview

HTML5 form features

Expanded form options, including things like date pickers, sliders, validation, placeholders and multiple file uploads. Previously known as "Web forms 2.0".

Usage
Global
% of all users
68.16% + 24.88% = 93.03%



Not all browsers support all features: <https://caniuse.com/>

The move towards HTML5



@BrendanEich

- HTML tags (1991/92):
`<title> <a> <isindex> <plaintext>`
`<listing> <p> <h1> <address>`
`<hp1> <dl> <dt> `
- **JavaScript** appeared in 1995, developed by Netscape - the start of client-side **dynamic** scripting for the browser

JavaScript is not part of HTML, but HTML5 assumes JavaScript to be available.

- **Plugins** (e.g. Adobe Flash, 1996) were created to go beyond what was possible with HTML

HTML5: a drive to return rich content *directly* into the browser.

- **Semantic HTML** (`<footer>`, `<aside>`, ...) enables large-scale automated processing of Web content

Web standardization

W3C **recommendation**: features are stable & (partially) implemented in multiple (2+) common browsers

- HTML is widely used, making standardisation slow
- Many different stakeholders are part of **W3C's HTML Working Group** (Microsoft, Apple, Google, Mozilla, Nokia, Adobe, Intel, Baidu, etc.)
- HTML5: candidate recommendation in Q4-2012, **W3C recommendation in Q4-2014**
- HTML5.1: candidate recommendation in Q1-2015, **W3C recommendation in Q4-2016**

HTML5.3: 1000+ specification pages

In practice: W3C standardises what the browser vendors agree upon and have chosen to implement.

Web standardization process

1. **Working Draft**: published for review by the community
2. **Candidate Recommendation**: published to gather implementation experience
3. **Proposed Recommendation**: sent to the W3C Advisory Committee for endorsement after reviewing and implementation experience has been gathered
4. **W3C Recommendation**: endorsed by the W3C

2.4.4 Numbers

2.4.4.1 Signed integers

Add developer-view styles

A string is a **valid integer** if it consists of one or more [ASCII digits](#), optionally prefixed with a "-" (U+002D) character.

A [valid integer](#) without a "-" (U+002D) prefix represents the number that is represented in base ten by that string of digits. A [valid integer](#) with a "-" (U+002D) prefix represents the number represented in base ten by the string of digits that follows the U+002D HYPHEN-MINUS, subtracted from zero.

The **rules for parsing integers** are as given in the following algorithm. When invoked, the steps must be followed in the order given, aborting at the first step that returns a value. This algorithm will return either an integer or an error.

1. Let `input` be the string being parsed.
2. Let `position` be a pointer into `input`, initially pointing at the start of the string.
3. Let `sign` have the value "positive".
4. [Skip whitespace](#).
5. If `position` is past the end of `input`, return an error.
6. If the character indicated by `position` (the first character) is a "-" (U+002D) character:

1. Let `sign` be "negative".
2. Advance `position` to the next character.
3. If `position` is past the end of `input`, return an error.

Otherwise, if the character indicated by `position` (the first character) is a "+" (U+002B) character:

1. Advance `position` to the next character. (The "+" is ignored, but it is not conforming.)
2. If `position` is past the end of `input`, return an error.
7. If the character indicated by `position` is not an [ASCII digit](#), then return an error.
8. [Collect a sequence of characters](#) that are [ASCII digits](#), and interpret the resulting sequence as a base-ten integer. Let `value` be that integer.
9. If `sign` is "positive", return `value`, otherwise return the result of subtracting `value` from zero.

HTML5 is modular and complex

- **Web Workers**: Web applications can spawn background workers to run processes (scripts) running in parallel to their main page
- **WebSocket**: bidirectional communication with server-side processes
- **WebRTC**: real-time communication between browsers (for videoconferencing, etc.)
- **HTML Media Capture**: enables user access to a device's media capture mechanism
- ...

HTML5: taking things offline with the AppCache



That sounds easy . . .

Application Cache is a Douchebag

by Jake Archibald · May 08, 2012

Published in Application Development, HTML, JavaScript

“The applicationCache is like an onion: it has many layers and as you peel through them you’ll be reduced to tears.”

“The fine art of debugging, a.k.a. ‘Kill me! Kill me now!’”

Common Pitfalls to Avoid when using HTML5 Application Cache



Tanay Pant



March 17, 2015



+1

Ramblings of a madman

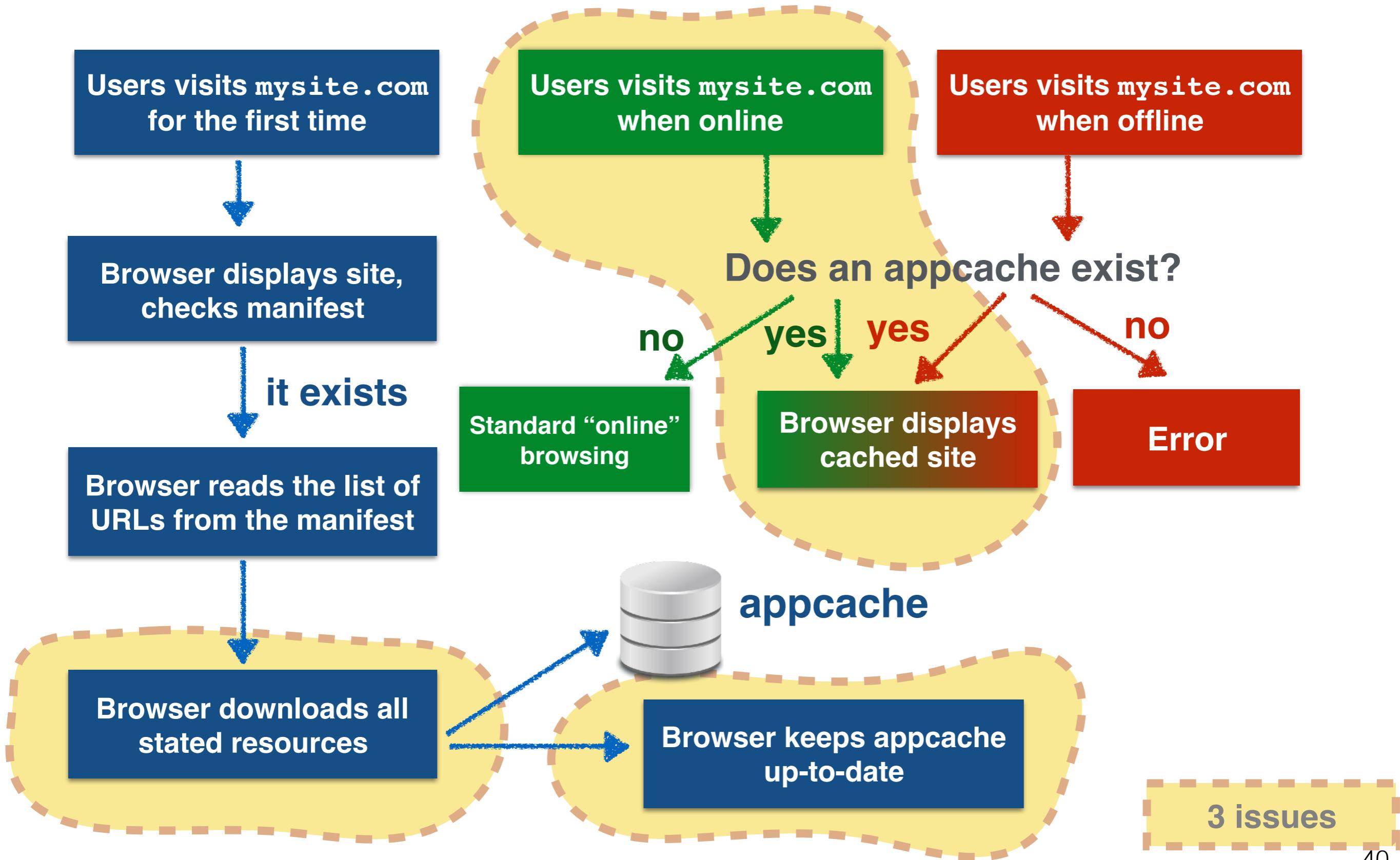
General ramblings about all things JavaScript and Firefox Developer Tools

The Application Cache is no longer a Douchebag

Getting Appcache’s Fallback to work, crossbrowser

“Offline webapps are... Lets be honest, a great idea marred by a particularly bizarre implementation, poor documentation and more gotchas than I can count.”

Appcache “workflow”



Taking things away is difficult

Can I use **appcache** ? Settings

1 result found

Offline web applications - UNOFF

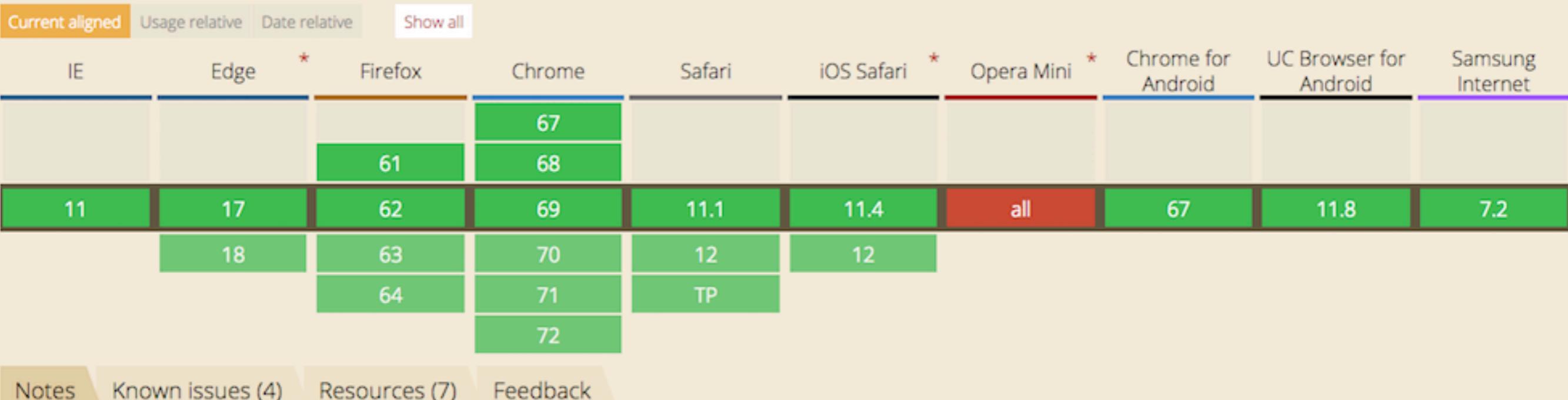
Usage

% of all users

Global

93.23% + 0.01% = 93.24%

Now deprecated method of defining web page files to be cached using a cache manifest file, allowing them to work offline on subsequent visits to the page.



This technology is being deprecated in favor of Service Workers

Taking things away is difficult

Can I use service workers ?  Settings

2 results found

Service Workers - WD

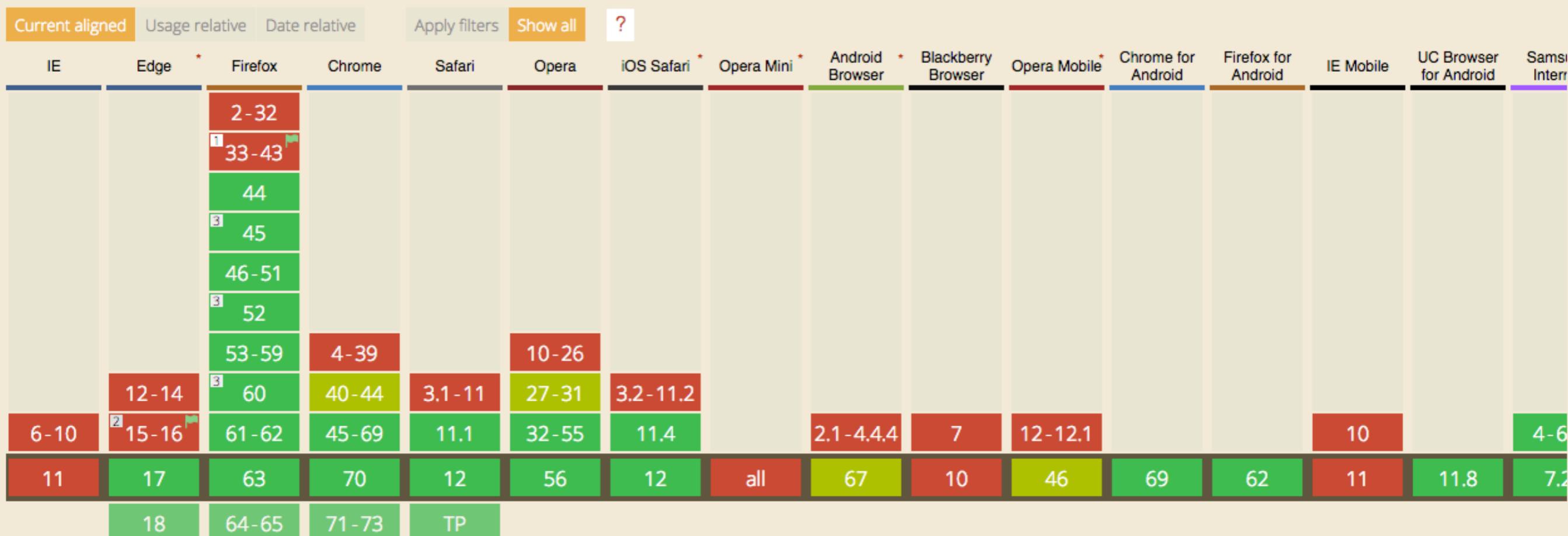
Usage

% of all users

Global

85.69% + 0.15% = 85.84%

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



- Work through **Chapter 4** (intro to JavaScript) of the Web development book **before** Monday's lecture!
- Work on **Assignment 1**.