



# HTML: the language of the web

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Search Twitter

# Demo time

[Inspector](#) [Console](#) [Debugger](#) [Style Editor](#) [Performance](#) [Memory](#) [Network](#) [Storage](#)

- [twitter\\_core.bundle.css](#) Save
- [Toggle style sheet visibility](#) [twitter\\_core.bundle.css](#) 2143 rules.
- [twitter\\_more\\_2.bundle.css](#) 2388 rules.
- [<inline style sheet #4>](#) 66 rules.
- [<inline style sheet #5>](#) 2 rules.
- [<inline style sheet #6>](#) 0 rules.
- [<inline style sheet #7>](#) 7 rules.
- [<inline style sheet #8>](#) 0 rules.
- [<inline style sheet #9>](#) 7 rules.
- [<inline style sheet #10>](#) 7 rules.

```
1 /*! normalize.css v3.0.0 | MIT License | git.io/normalize */html {  
2   font-family:sans-serif;  
3   -ms-text-size-adjust:100%;  
4   -webkit-text-size-adjust:100%  
5 }  
6 body {  
7   margin:0  
8 }  
9 article,aside,details,figcaption,figure,footer,header,hgroup,main,nav,section,summary {  
10   display:block  
11 }  
12 audio,canvas,progress,video {  
13   display:inline-block;  
14   vertical-align:baseline  
15 }  
16 audio:not([controls]) {  
17   display:none;  
18   height:0  
19 }  
20 [hidden],template {  
21   display:none  
22 }  
23 a {  
24   background:transparent  
25 }  
26 a:active,a:hover {  
27   outline:0  
28 }  
29 abbr[title] {  
30   border-bottom:1px dotted  
31 }
```

**CWI @CWI\_nl**

Op zaterdag 17 november om 14.28 uur is het exact dertig jaar geleden dat Nederland als eerste land in Europa werd aangesloten op het publieke #internet. Teus Hagen en @stevenpemberton waren erbij en vertellen hun...



1

**FD Nieuws** @FD\_Nieuws · 10m

Chemicaliënhandelaar IMCD breidt uit in India

[Translate Tweet](#)**Chemicaliënhandelaar IMCD breidt uit in India**

IMCD koopt bedrijf Aroma met omzet van €26 mln.

fd.nl

# Learning goals

- **Apply** web design principles during the design stage of a web app.
- **Explain** the ideas behind usability testing and **employ** it
- **Employ** HTML to create web pages.
- **Create** basic HTML documents containing forms

# Web sites vs. web applications

>10 million lines of code

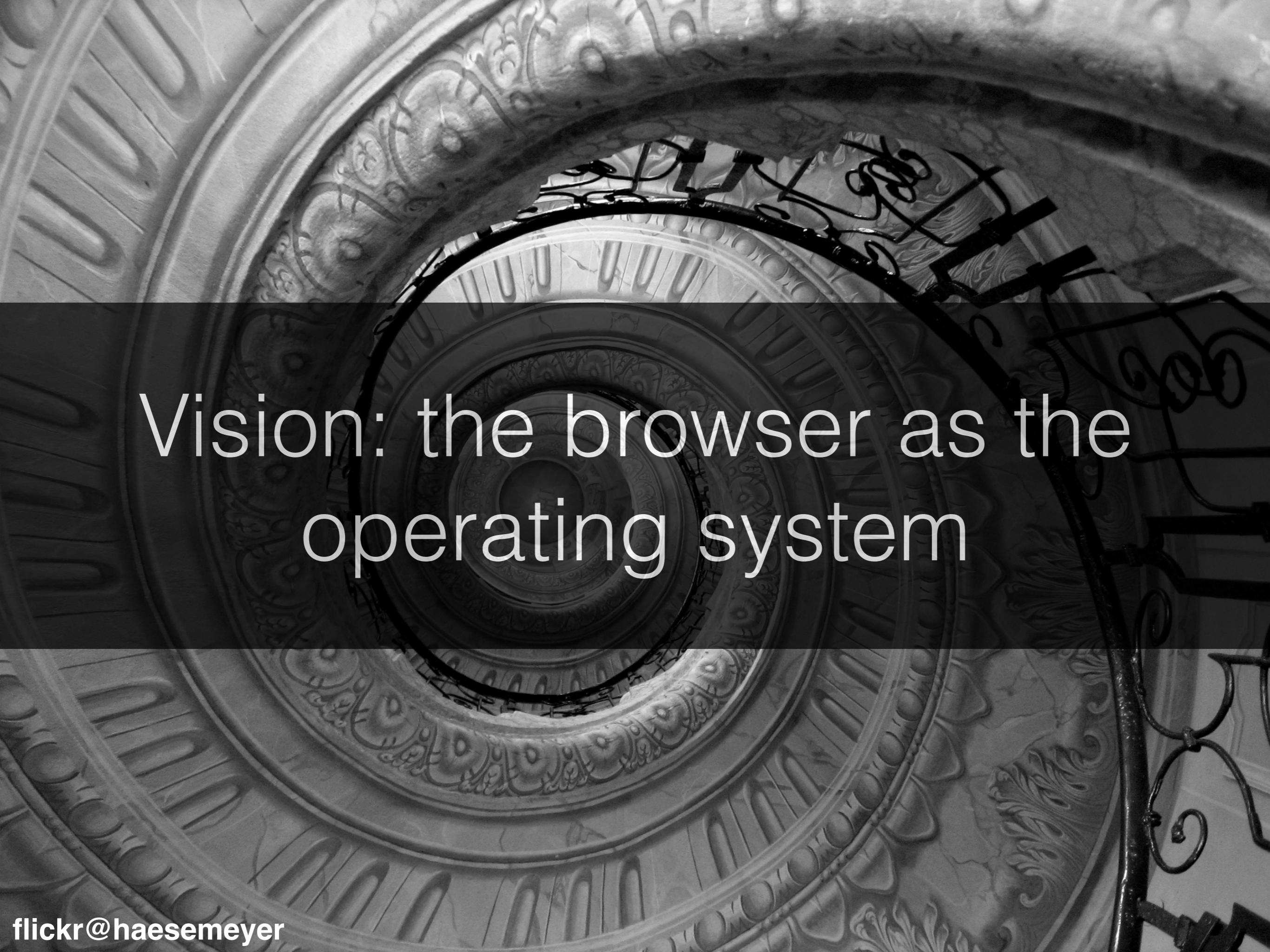


"As web browsers and the web engine components that power them become ubiquitous [...], developers are increasingly **using web technologies** to build **applications** and are relying on web engines as **application runtime environments**.

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.

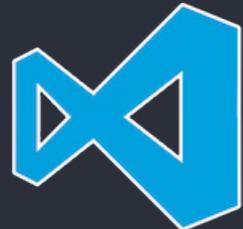


Vision: the browser as the  
operating system

# Not just for the Web: ELECTRON



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

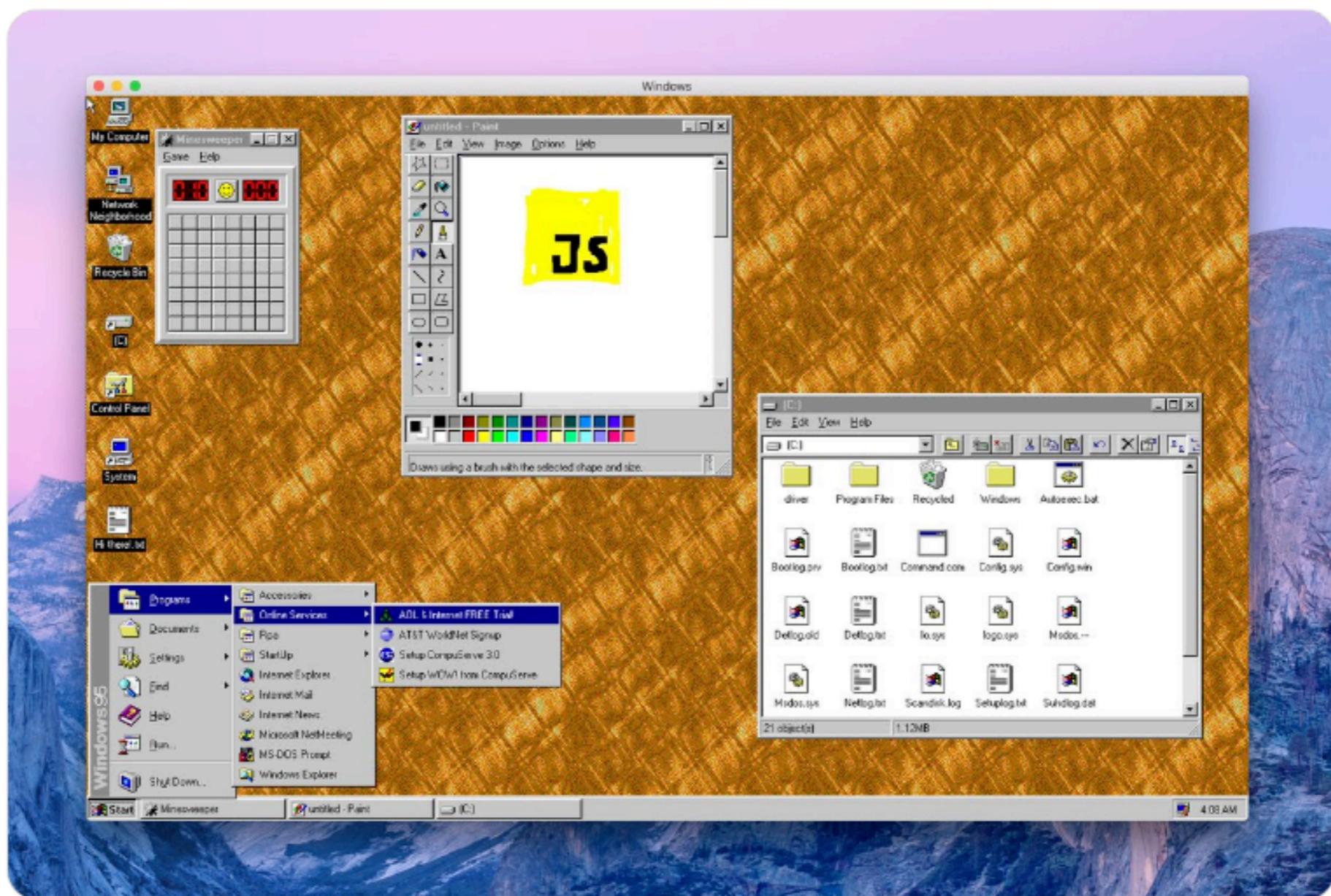




Felix Rieseberg @felixrieseberg · Aug 23

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

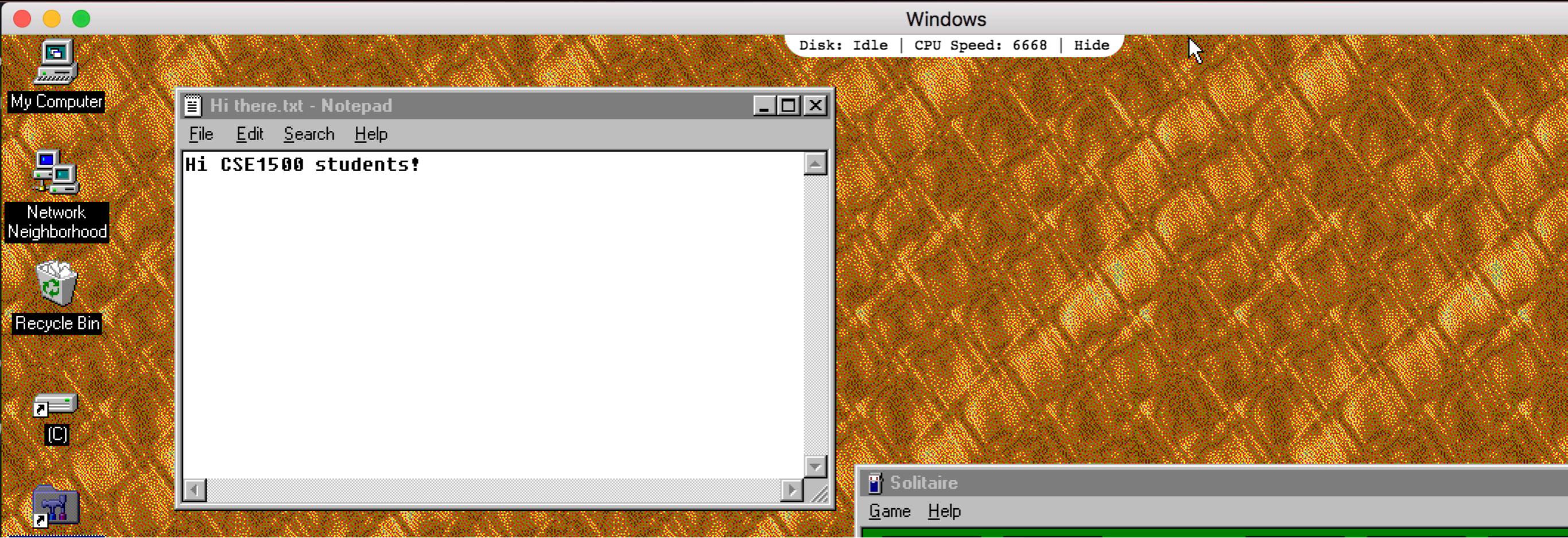


Show this thread

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.

# 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 content area features a large orange banner 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 this, 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

Blijf op de hoogte van alle gratis artikelen op Koopplein.nl en volg ons op Twitter! Om het gebruikers nog gemakkelijker te maken, zal Koopplein Nederland alle advertenties uit de rubriek 'Gratis aangeboden' van alle lokale Kooppleinen twitteren. Op die manier kunnen geïnteresseerden snel reageren en hoeven zij ook onderweg niets van Koopplein te missen. Gebruikers kunnen ook hun eigen advertenties eenvoudig delen met hun netwerk via social media als LinkedIn, Twitter en Facebook. Via de bek...

[Lees verder »](#)

### Bekijk hieronder onze introductiefilm

Uitgever worden van onze snel groeiende formule Koopplein.nl? Wanneer in jouw gemeente nog geen licentie is afgegeven, maak jij kans je eigen Koopplein te vestigen. Slechts één ondernemer krijgt daarvoor het exclusieve recht in zijn gemeente. Reageer dus snel. Bekijk onze introductiefilm Koopplein.nl omvat een netwerk van lokale marktplaatsen op internet. Elke gemeente heeft een eigen Koopplein. Dat wordt geëxploiteerd door een ondernemer uit die gemeente/streek. Jij kent jouw...

[Lees verder »](#)





# KOOPPLEIN.NL

De gratis marktplaats in je eigen gemeente



## Zoek in je woonplaats

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

**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/](http://www.toyota.nl/) ▾

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



Toyota



About 640,000,000 results

August 2013

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

Find out about the latest new car

Web

Images

Videos

News

Shopping

More

Show search tools

Ads

[Toyota.com - New Toyota Incentives](#)[www.toyota.com/Deals](http://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/](http://shop.autonationtoyotanortharlington.com/)

Browse And Get Our Internet Price.

[Toyota½ Toyota - JeffHunterToyota.com](#)[www.jeffhuntertoyota.com/](http://www.jeffhuntertoyota.com/)

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

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

[Current Toyota Vehicles](#)

Find your perfect 2013 Toyota vehicle.

Narrow Current Toyota models down

[Find a Toyota Dealer](#)

Finding a Toyota dealership is easy.

Our dealer locator provides the

[Rav4](#)

The Toyota RAV4 crossover SUV

features and price. See the 2013...

[Toyota Tacoma Truck 2013](#)

Check out the 2013 Tacoma pick-up

trucks and you'll find it's tough outside

and inside. See the 2013...

[Prius](#)

2013 Photo Gallery - Toyota

Prius. Toyota's hybrid

Dark pattern: "... user interface design choice that benefits an online service by coercing, steering, or deceiving users into making unintended and potentially harmful decisions."

Category	Type	Description	# Instances	# Websites	Asymmetric? Cover?	Deceptive? Hides Info?	Restrictive?	Cognitive Biases
Sneaking	Sneak into Basket	Adding additional products to users' shopping carts without their consent	7	7	○ ○ ● ● ○	○ ○ ● ● ○	○ ○	Default Effect
	Hidden Costs	Revealing previously undisclosed charges to users right before they make a purchase	5	5	○ ○ ● ● ○	○ ○ ● ● ○	○ ○	Sunk Cost Fallacy
	Hidden Subscription	Charging users a recurring fee under the pretense of a one-time fee or a free trial	14	13	○ ○ ● ● ○	○ ○ ● ● ○	○ ○	None
Urgency	Countdown Timer	Indicating to users that a deal or discount will expire using a counting-down timer	393	361	○ ● ○ ○ ○	○ ● ○ ○ ○	○ ○	Scarcity Bias
	Limited-time Message	Indicating to users that a deal or sale will expire soon without specifying a deadline	88	84	○ ● ○ ○ ●	○ ● ○ ○ ●	○ ○	Scarcity Bias
Misdirection	Confirmshaming	Using language and emotion (shame) to steer users away from making a certain choice	169	164	● ○ ○ ○ ○	● ○ ○ ○ ○	○ ○	Framing Effect
	Visual Interference	Using style and visual presentation to steer users to or away from certain choices	25	24	○ ● ○ ○ ○	○ ● ○ ○ ○	○ ○	Anchoring & Framing Effect
	Trick Questions	Using confusing language to steer users into making certain choices	9	9	● ● ○ ○ ○	● ● ○ ○ ○	○ ○	Default & Framing Effect
	Pressured Selling	Pre-selecting more expensive variations of a product, or pressuring the user to accept the more expensive variations of a product and related products	67	62	○ ● ○ ○ ○	○ ● ○ ○ ○	○ ○	Anchoring & Default Effect, Scarcity

Mathur et al., *Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites*, CSCW 2019.

# Rule#2: minimize noise & clutter

This screenshot shows the ZDNet homepage from April 14, 2001. The layout is cluttered with various sections and links. At the top, there's a banner for 'Cameras | Reviews | Shop | Business | Help | News | Handhelds | Desktops | Notebooks | Downloads | Developer'. Below the banner, the ZDNet logo is prominently displayed with the tagline 'Where Technology Takes You'. A large 'Click Here!' button is centered above a search bar. To the right of the search bar are links for 'Free Downloads', 'Desktop Best Buys', and 'Digital Audio Rocks'. The main content area includes a 'BREAKING NEWS' section with links to stories about Intel, Apple, and Microsoft. There are also sections for 'HOT PRODUCTS', 'REVIEWS', 'BUSINESS & TECH', 'TECH NEWS', 'GAME SPOT', 'DOWNLOADS', 'ELECTRONICS', and 'TODAY ON ZDNET'. A sidebar on the left lists 'Hot hard drives here' and a top 5 list of hard drives.



14.04.2001

This screenshot shows the ZDNet homepage from October 14, 2014. The layout is much cleaner and organized. The ZDNet logo is at the top left, followed by a navigation bar with links for 'Hot Topics', 'Reviews', 'Downloads', 'Newsletters', and 'White Papers'. Below the navigation is a red header bar with links for 'UK Edition', 'UK News', '3D Printing', 'Hybrid Cloud', 'Wearables', 'Enterprise Software', 'Security', 'Microservers', and 'Tablets'. The main article features a large image of a Microsoft logo and the headline 'Microsoft builds Snapchat-like WindUp for Windows Phone'. Below the main article are 'Featured Stories' for Firefox OS, Samsung SmartThings, and Google Safe Browsing. A 'Tip us off!' section allows users to suggest topics. The 'Latest Articles' section includes a story about Ferguson and public security cameras. A 'Great Debate' poll is shown. The right sidebar contains a newsletter sign-up form, social media links, and a 'Top Stories' section with a list of five popular articles. The overall design is modern and minimalist compared to the 2001 version.

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

The screenshot shows the SurveyMonkey homepage. On the left, there is a large, close-up photograph of a woman with blonde hair and glasses, smiling. To her right is a teal-colored section containing the following content:

**Create Surveys. Get Answers.**

The central part of the page features a three-step process flow:

- Design**: Represented by a lightbulb icon. Description: "Build your own surveys or choose from our templates."
- Collect**: Represented by a chain-link icon. Description: "Choose how to distribute and start collecting responses."
- Analyze**: Represented by a pie chart icon. Description: "Use our powerful analytical tools for intelligent insights."

On the far right, there are two call-to-action buttons:

- Start Today** (in red)
- Pro Sign Up ▶** (in yellow)
- Unlimited Surveys & Responses**
- Sign Up FREE ▶** (in white)
- Just the Basics**

December 2013

# EXPECTATIONS

VS.

# REALITY

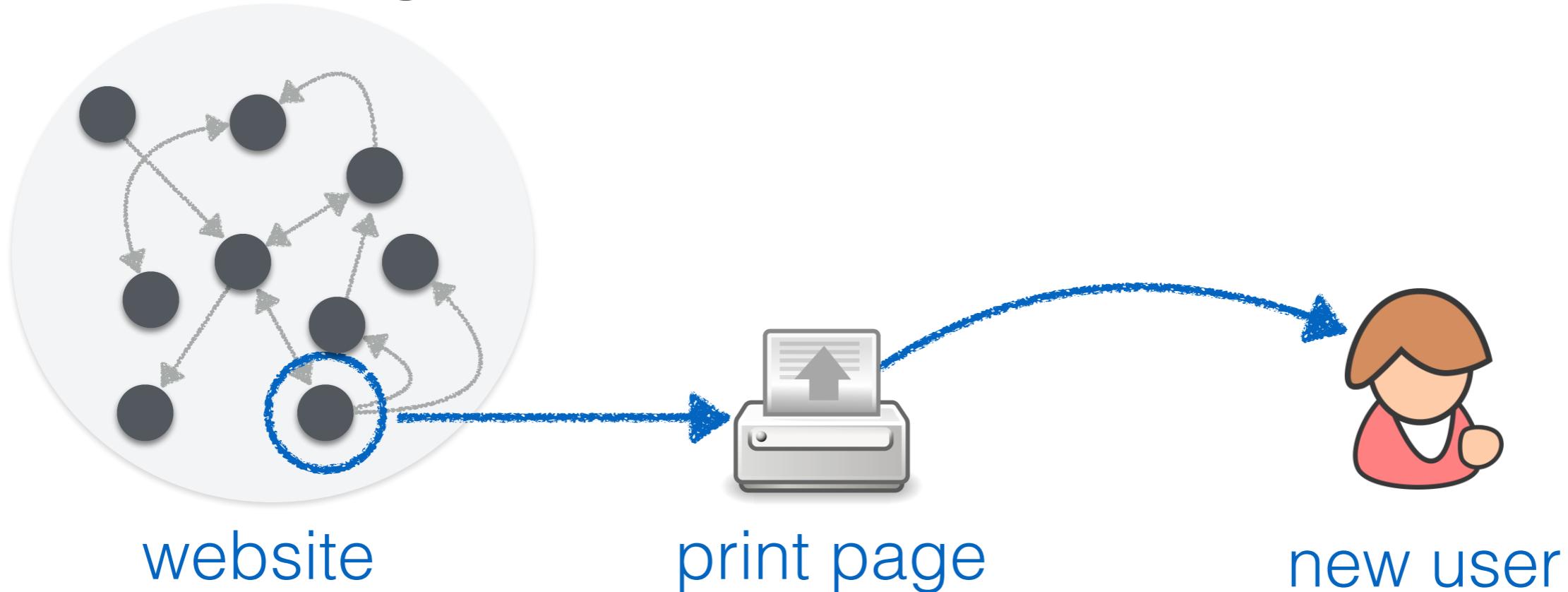
**Idea:** web users are **rational**, **attentive** with a **clear goal** in mind

**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**

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”

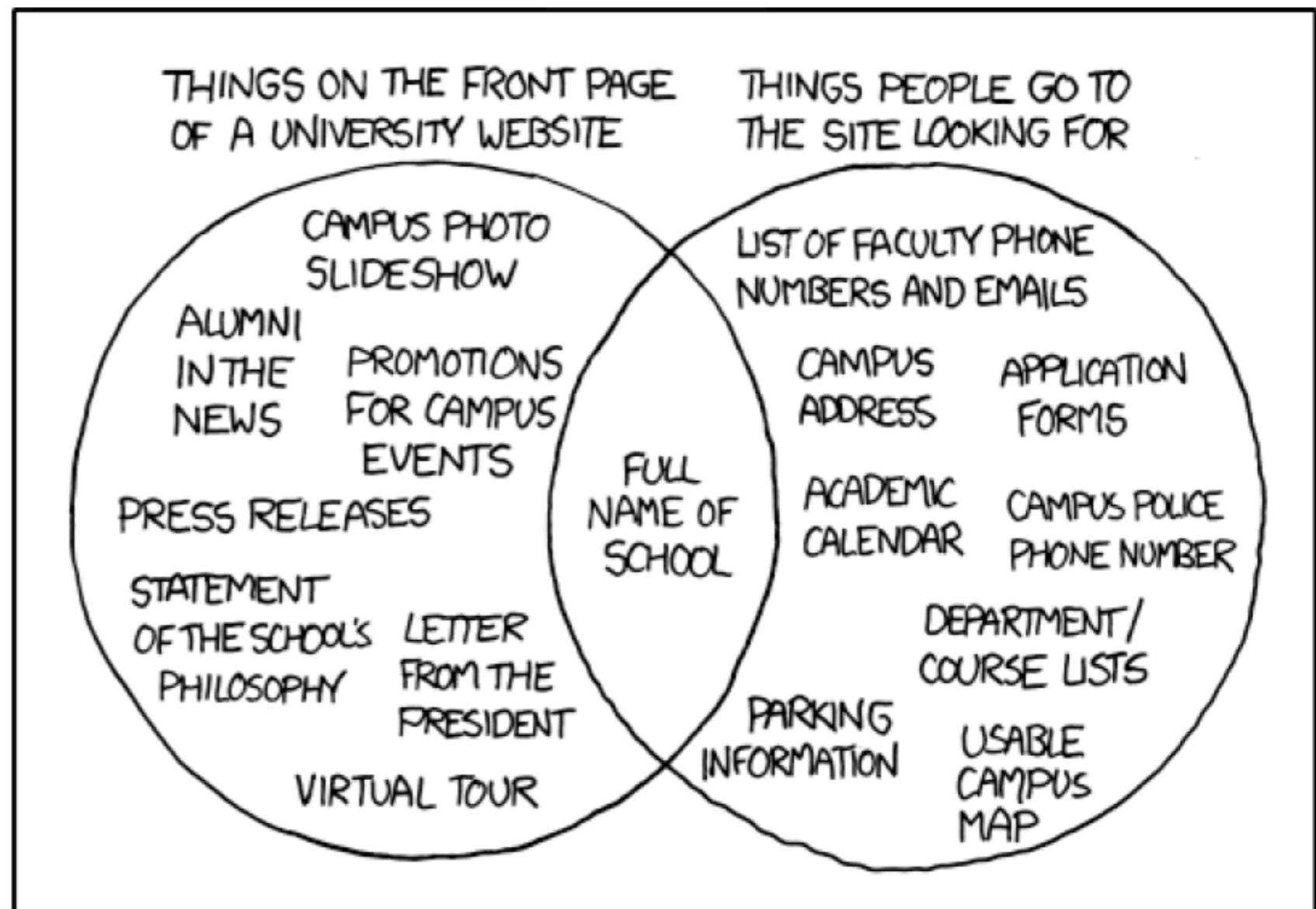


**As quickly as possible** the user should circle:

- **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

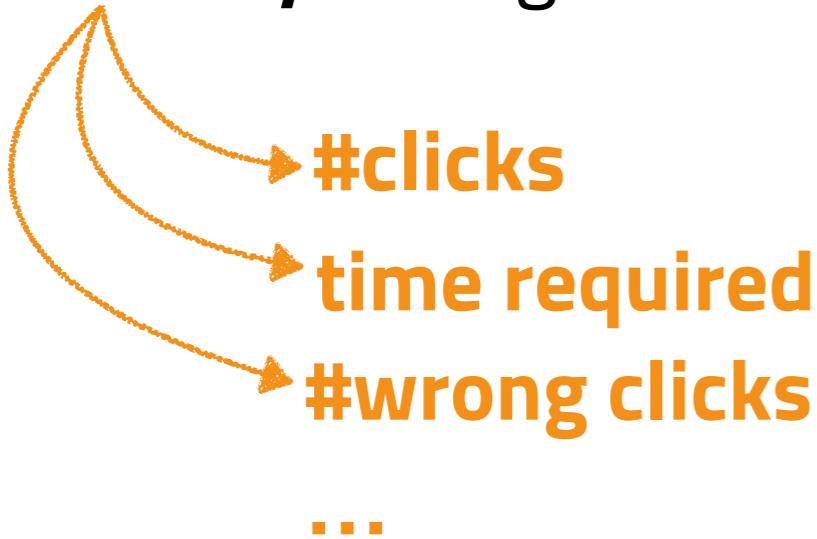
1. What **is** this?
2. What can I do here?
3. Why **should** I be here?
4. What do they **have** here?



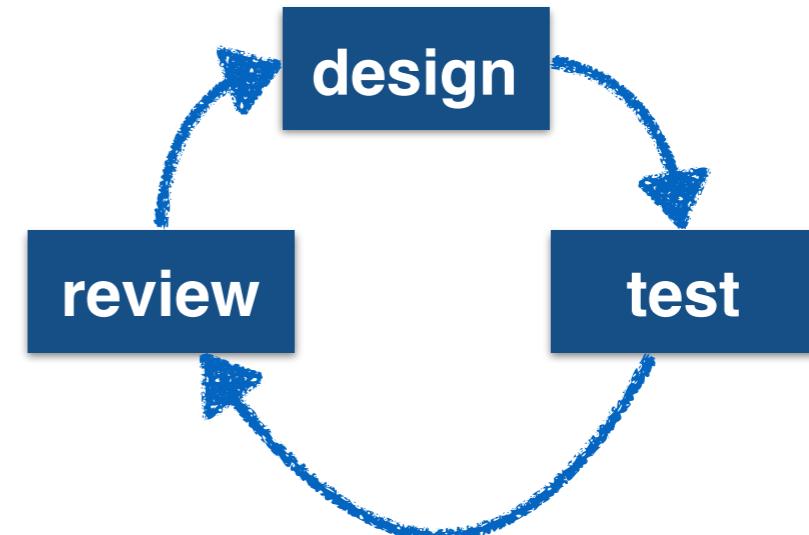
<http://xkcd.com/773/>

# 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>



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



Observer

# 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

# Performance metrics

- Complex web applications need to be **performant**
- Many performance metrics exist:
  - the time until the first content is rendered;
  - the time until the user can successfully interact with the application;
  - the time between the user's first interaction with the application and the time the browser responds to it

JavaScript snippet

Recompute style

Recompute layout

Repaint



# 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



- LS

Usage

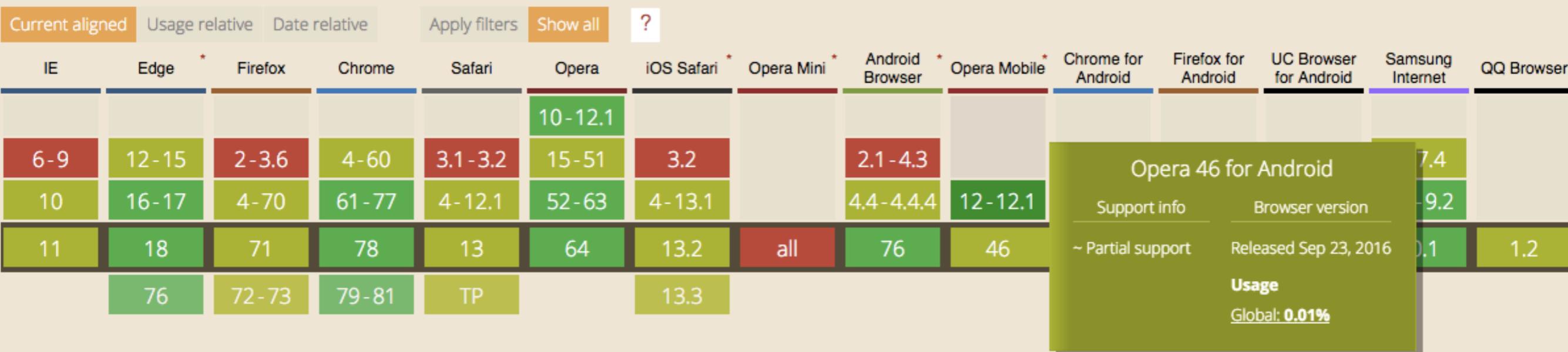
% of all users



Global

72.8% + 24.44% = 97.24%

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



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

# The move towards HTML5



- HTML tags (1991/92):

```
<title> <a> <isindex> <plaintext>  
<listing> <p> <h1> <address>  
<hp1> <dl> <dt> <ul>
```

@BrendanEich

- **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 standardisation

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 standardisation 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

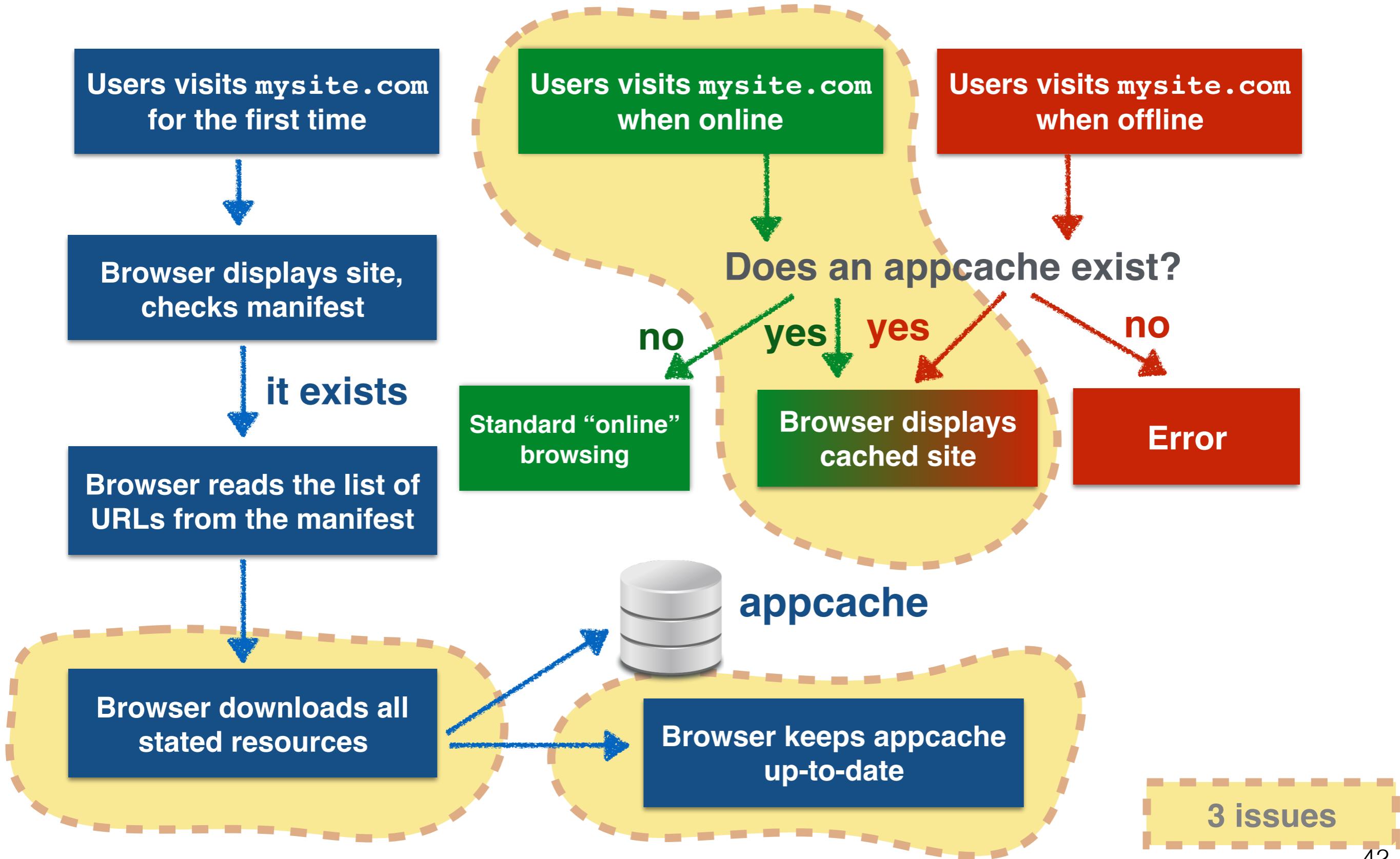
General ramblings about all things JavaScript and Firefox Developer Tools

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

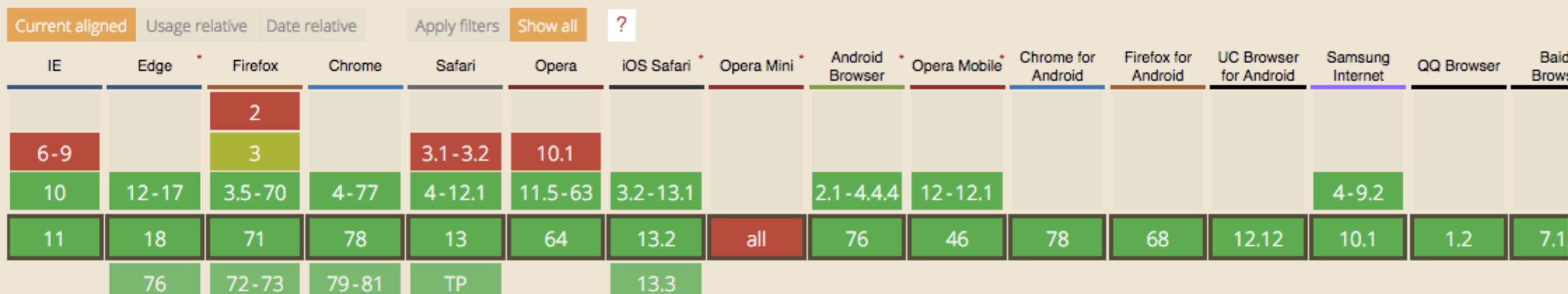
Can I use  ? 

1 result found

## Offline web applications - UNOFF

Usage % of all users    
Global 97.42%

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.



Notes

Known issues (4)

Resources (7)

Feedback

This technology is being deprecated in favor of Service Workers

# Taking things away is difficult

- Work through **Chapter 4** (intro to JavaScript) of the web coursebook before the next lecture.
- Work on **Assignment 1**.