

MOBILE WEB

OVERVIEW

- Introduction
- Browsers and Rendering Engines
- Mobile First
- Responsive Webdesign
- Final Remarks

MOBILE WEB

MOBILE WEB

- Every new phone has a web browser in it
- Mobile web usage will exceed desktop web usage
- The Web is the only true cross-platform technology

Mobile web has its own challenges, but there is no other technology that allows you to create content and apps that reach every platform.

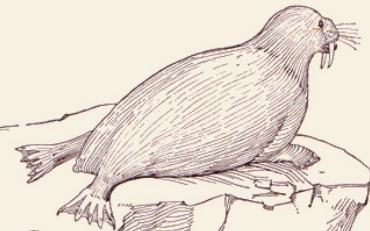
2.1 Billion HTML5 Browsers on Mobile Devices by 2016 says ABI Research

WEBSITE IN DESKTOP BROWSER

The Splendid Walrus: Public Ho... +

www.splendidwalrus.com Suchen

HOME ON TAP Now ABOUT US



THE SPLENDID WALRUS: PUBLIC HOUSE & SPIRITS

VISIT US!

Location
1543 SW Pretend Street
Portland, OR 97201 [\[Map\]](#)

Hours
M-F
Until midnight
Sa-Su
Until 1AM*
*At least

Call us
+1 (503) 555-1212

Beer! by PSYCHOSTI...  

THIS MONTH'S SPECIAL

25% off Jazz Hands Vodka: locally-made vodka bliss.

Jazz Hands Vodka is the newest product from local distiller Awesomesauce. Bright and vivid, it's the perfect warm-weather treat. We've concocted some pretty wonderful custom cocktails to highlight it (try the *White Devil* or the *Regret*). Or you can go classic with our ultra-fresh Lemon Drop (made with organic citrus).



The Splendid Walrus pub is *the* place in downtown Portland, Ore., to do all of these things:

- ☞ Sample local and hard-to-find microbrews—always at least 20 rotating taps
- ☞ Meet friends and hang out
- ☞ Surf the Web while sipping a pint (free wifi!)
- ☞ Catch a cult flick (movie Mondays!)
- ☞ Have a favorite cocktail or sample spirits from local distilleries

See you soon! Love, The Splendid Walrus

SAME PAGE IN MOBILE SAFARI

- Problems?



POSSIBLE PROBLEMS

- Many different mobile web browsers
- Support for web technologies varies
- Mobile devices are smaller and slower
- Mobile interfaces require us to rethink our sites

Fundamental change in use

PC internet

- Shared, or used at work and locked-down
- Semi-portable at best
- Web and web search

Mobile internet

- Personal
- Taken everywhere
- Web, web search, apps, social, location, service integration, prediction, APIs, image recognition, local wireless...

MOBILE IMPORTANCE

- 2014: 37 Mio mobile Internet users in Germany
- This is a 25% growth compared to the year before

Source

Since April 2015 mobile usability of a website is one of Google's ranking factors

Google

Smartphone users spend most of their time in apps



86%

spent in apps



14%

spent in the
browser

Source: Flurry 2014

TIME SPENT IN APPS

That looks pretty bad for the Web.

Until you realize that 60% of the time in native is spent in just four apps (social and gaming).

Google

Smartphone users spend most of their time in apps



86%

spent in apps

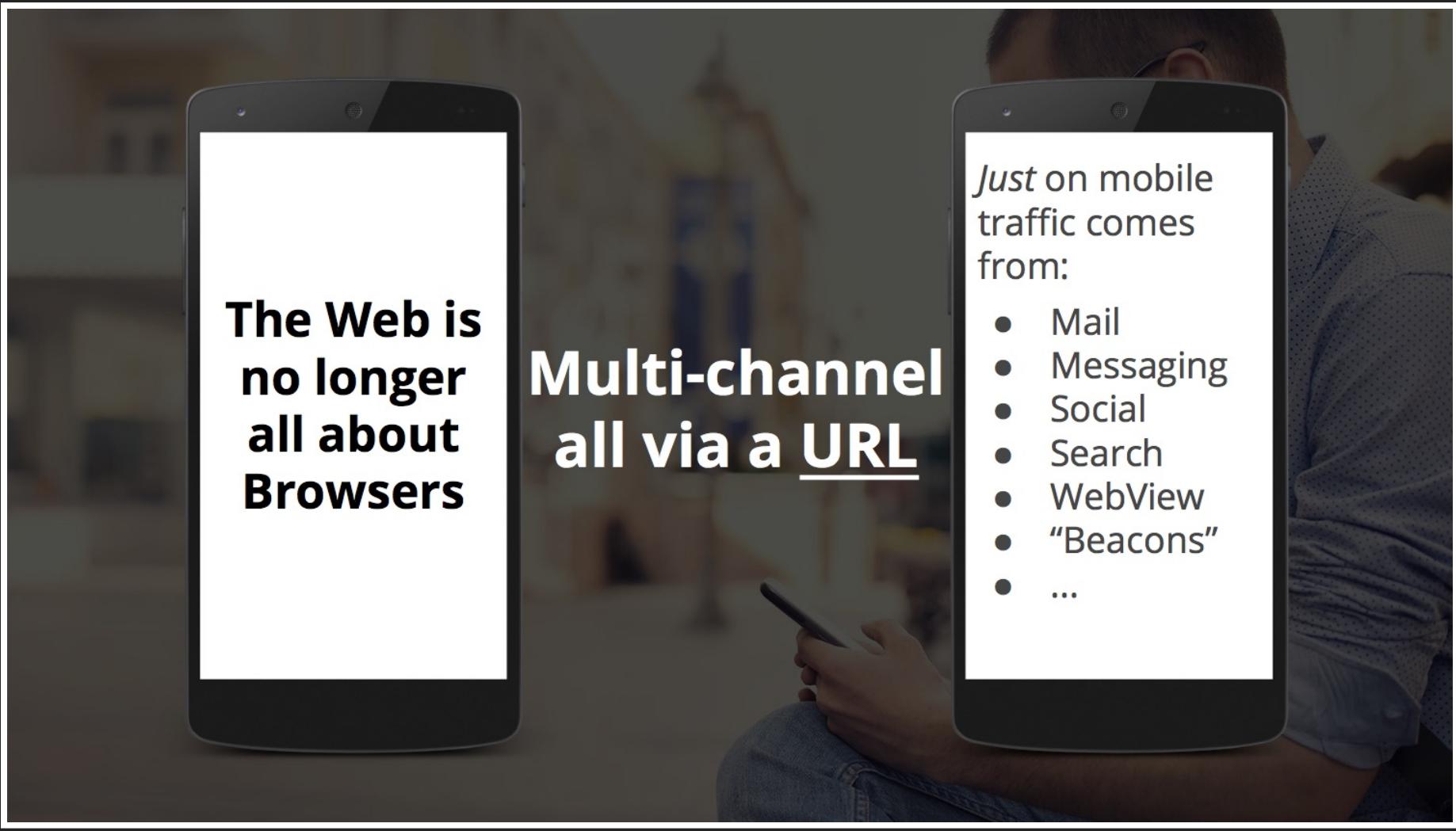
?%
spent **on web
in apps**



14%

spent in the
browser

Source: Flurry 2014

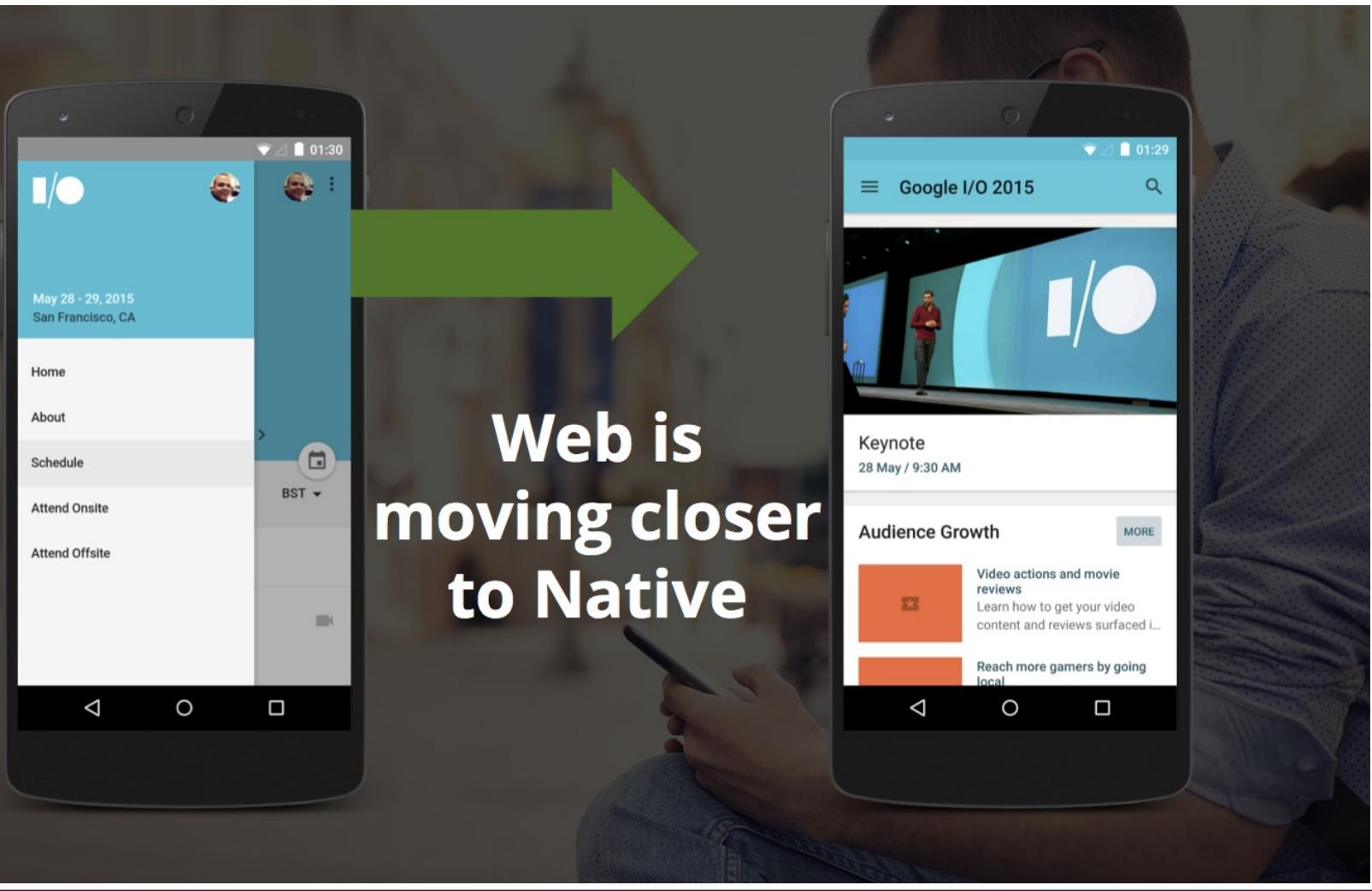


The Web is
no longer
all about
Browsers

Multi-channel
all via a URL

Just on mobile
traffic comes
from:

- Mail
- Messaging
- Social
- Search
- WebView
- “Beacons”
- ...



**Web is
moving closer
to Native**



May 28 - 29, 2015
San Francisco, CA

Home

About

Schedule

Attend Onsite

Attend Offsite

01:30

BST ▾

▼

01:29

≡ Google I/O 2015



Keynote
28 May / 9:30 AM

Audience Growth

MORE

Video actions and movie reviews
Learn how to get your video content and reviews surfaced i...

Reach more gamers by going local

APPS AND WEBSITES

- Apps
 - Native Apps
 - Web Apps
 - Hybrid Apps
- Websites
 - Tailored to mobile browsers
 - Responsive

APPS AND WEBSITES

- Webapps
 - Dynamic, interactive
 - Rather single-page implementations
 - Client side logic
- Websites
 - Rather static content
 - Multiple pages, links
 - Forms, server side logic
- But: No strict separation possible

NEWS PORTAL

- news.ch

news.ch

News Wetter Sport People Meinung! Digital Lifestyle Kultur Sommer Stellenmarkt
Inland | Wirtschaft | Ausland | Boulevard | Wissen | ETH-Klimatag | Neuesport | Fußball | Tiere | Kompetenzmarkt | Mehr

Ban droht mit «ernsten Konsequenzen»: Ban Ki-Moon hat eine Konsequenzurteil gefordert, falls sich die Beziehungen über Chinasseien verschlechtern. (Foto: AP) | © AP Getty Images

CONCORDIA senkt Prämien für Spitalversicherung um 41 Mio Franken



Ban droht mit «ernsten Konsequenzen»

»Druck erhöht«: Ban Ki-Moon verhandelt den Frieden in Syrien. (Foto: AP Getty Images) | © AP Getty Images

Florinette zu stark: GC droht Euarcup-Aus

»Weltmeister werden«: Die Gruppeneuphorie hält auch das dritte Europacup-Fest der Florinette nicht vom ersten Sieg ab. Der FC Zürich gewinnt im Finale der Europa-League-Pokalgruppe gegen...

Schweizer Verlierer beginnen bald gegen die anderen

Florinette und Neuchâtel Xamax müssen auf dem Rücken der anderen in der Europa-League-Pokalgruppe gegen...

Inland



Bund will Fördergelder für Photovoltaik drastisch kürzen

GREEN INVESTMENT: Einvernehmen Energie: Bern: Das Bundesamt für Energie (BFE) will Fördergelder für diverse Technologien für erneuerbare Energien kürzen. Bisher standen Fördergelder für alle Photovoltaik...

»In der Schweiz sind zwei Gruppenwerte für die Erzeugungsermittlung von...



Bundesrätin Barbara Vischer fordert gegen Hildebrand

Die «ersteine Affäre Zürich» – Die juristische Aufarbeitung der Affäre misslingt jetzt weiter: Bundesrätin Barbara Vischer (CVP) hat...

»Bündnispartei CVP nach Blücher-Beschwerde einigt sich mit Christen-Demokrat Ueli Usteri über Arbeitsteilung, die...

Mehr Inland-Meldungen

HEBELSPÄLER



CONCORDIA senkt Prämien für Spitalversicherung um 41 Mio Franken



BILDERGALERIEN



ARTS & CULTURE in «schweizerischen Kreislauf»: Investitionen in der Medienkult. immer wiederholte sich...
© AP Getty Images

GFT GELESEN

»Gute Idee, lange Voraussicht, wird doch nie verwirklicht« (20)
Schweizer EM-Medienkritik gewinnt (20)
Jahr etwas nach Gedanken in den Blocker-Preis ein (20)
Musik verleiht den Gelingungspreis (20)
Bund will Fördergelder für Photovoltaik drastisch kürzen (20)

news.ch

Ticker

0020 Man City-Star neu in West-Bronn-Therapie
0021 Ban droht mit «ernsten Konsequenzen»
0021 Pionier am Rande zu Amman
0021 Internationale Klimafusionsgruppe greift
0021 Pfegepreis in Italien mit mehreren Minuten vergewaltigt
0020 Schweizer-Europaparole liegen zurück
0019 System McCann und Obama unter Druck
0019 Schauspielerin ist mit ihrem Hund gestorben
0014 Uefa spielt zwei schwierige Schiedsrichter
Letzte Meldungen

WETTBEWERB



MARKUS KREBS LITERATUR UNTER BETÄUBUNG
Markus Krebs «Literatur unter Betäubung - Live in Heiden»
Krebs ist einer der bestsellenden Autoren des Landes. Seine Romane für das Zehnjährige bis zum Zwanzigjährigen erzielen den KTS Comedy Award. Mit gewonnen. Der 41-jährige Düsslinger hat seine damit reiche...

stellenmarkt.ch

Diese Seiten aus der Berichtsgalerie Online-Marketing, Social Media

Soziale Medien Online-Marketing Manager (m/w) | © AP Getty Images

Marketing Assistant Online-Marketing Assistant (m/w) | © AP Getty Images

E-Business Manager Online-Marketing Manager (m/w) | © AP Getty Images

Projektive Online-Spezialist Der dynamische Online-Sales Bereich investiert von seinen Projektionsberatern bei der am schweiz...

Marketing Online-Spezialist Marketing (m/w) | © AP Getty Images

Trainer Online Sales & Marketing (Clean / Wissen) Berät die Firmengruppe und ihre strategischen Bezugspunkte in die Phasen und für welche Monate...
© AP Getty Images

Akkreditierte - Akkreditierte Online-Marketing & Marketing-Support (FIR/PR) Ihr zufriedenstellender Arbeitsplatz umfasst...

NEWS PORTAL



- No easy conversion to mobile version
- Responsive webdesign doesn't help
- Too much information
- Too many page elements
- Necessary: reduce to the essential
- Mobile: Website on a diet

DESKTOP AND MOBILE

The screenshot shows the homepage of news.ch. At the top, there's a navigation bar with links like News, Wetter, Sport, People, Meinung!, Digital Lifestyle, Kultur, Sommer, Stellenmarkt, Inland, Wirtschaft, Ausland, Boulevard, Wissen, ETH Altklima, Hebelspalter, Freizeit, Tiere, Kompetenzmarkt, and Mehr. Below the navigation is a search bar. A banner at the top reads "CONCORDIA senkt Prämien für Spitalversicherung um 41 Mio Franken". The main content area features several news articles with images and headlines. One article about a man in a suit is titled "Ban droht mit «ernsten Konsequenzen»". Another article about football is titled "Florentia zu stark: GC-Aus". There are also sections for "INLAND", "WETTREIBER", "FORUM", and "HEBELSPALTER". On the right side, there's a sidebar with a "BILDERGALERIEN" section showing small thumbnail images.



MOBILE WEB ADVANTAGES

- Web technologies offer the easiest route into mobile development
- HTML, CSS and JavaScript
- Make content accessible on almost any platform
- Save development time and cost
- Lower maintenance costs
- Independence of app stores

MOBILE WEB CHALLENGES

- Platform integration of native apps cannot be reached
- More or less dependent on connectivity
- Lack of developer tools compared to native app development
- Monetization of mobile sites can prove tricky

If monetization is one of the key requirements, a hybrid or web app strategy could prove to be a good compromise.

HTML, CSS, JAVASCRIPT

- Progress in web standards
- Look-and-feel *close* to that of apps possible
- Single code base for a number of popular devices
- Access hardware such as the camera and microphone
- Local data storage for offline availability
- Problem: technology fragmentation across mobile browsers

BROWSERS AND RENDERING ENGINES

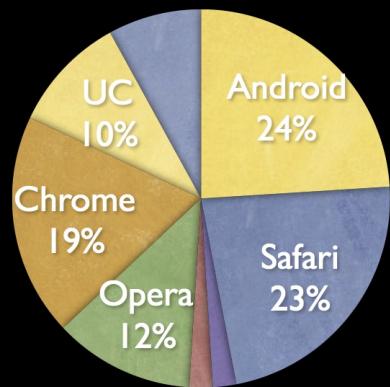
DOMINANT MOBILE RENDERING ENGINES

- WebKit (Safari)
- Blink (Chromium)
- Trident (Internet Explorer), EdgeHTML (Edge)

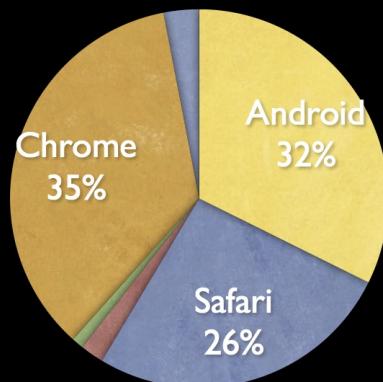
(EdgeHTML is a fork of Trident)

Mobile browser shares 2014

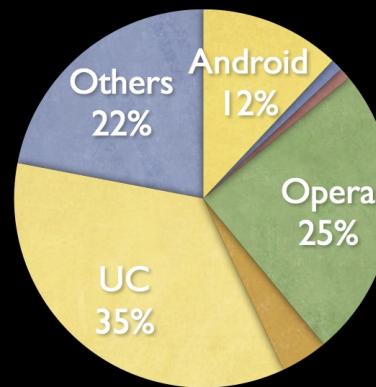
Global



Germany



India

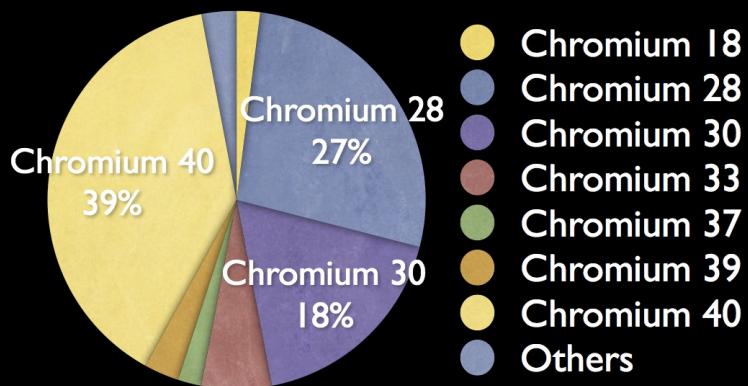


- Android
- Safari
- BlackBerry
- IE
- Opera
- Chrome
- UC
- Others

Source: StatCounter.com

Chromia shares

Netherlands

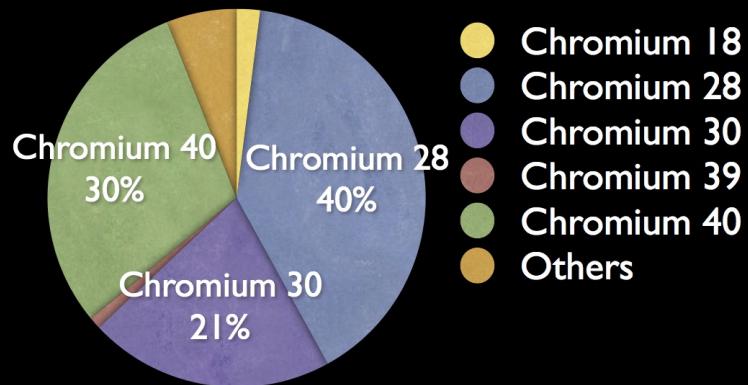


Source: about 46K Chromium-impressions
from a Dutch ad network; 31st Jan 2015

See also: [http://www.quirksmode.org/blog/archives/2015/02/
counting_chromi.html](http://www.quirksmode.org/blog/archives/2015/02/counting_chromi.html)

Samsung only

Netherlands



Source: about 46K Chromium-impressions
from a Dutch ad network; 31st Jan 2015

CHROME ON IOS

- Chrome on iOS is not Chrome
- Testing on Chrome on iOS is in fact an Apple WebView test

BROWSERS ON ANDROID

- Android WebKit
 - Originally the Android default browser
 - Slightly modified by device vendors
 - HTC Android WebKit, Samsung Android WebKit, ...
 - Development stopped after Android 4.3
- Chrome
 - Now the Android default browser
 - Device vendor can use Google's version
 - Or they can build their own based on Chromium
 - HTC Chromium, Samsung Chromium, ...

CHROMIA

- Nexus, Motorola, Sony: Google Chrome 40
- Samsung Chromium 28
- HTC Chromium 33
- LG Chromium 30 (or 34)
- Xiaomi Chromium 34 or 35
- Cyanogen Chromium 33
- Huawei Chromium 30

WEBVIEWS

- Embedded browser that native apps can use
- Android 4.3 and lower: AndroidWebKit
- Android 4.4: Chromium 30; fixed version
- Android 4.4.3: Chromium 33; fixed version
- Android 5: Chromium 42; updated with Chrome

GOOGLE SERVICES

- Package of crucial Google apps
- Maps, YouTube, Play ... and Chrome
- Device vendors may opt in to or out of the *entire* package
- But: Not mandatory to make Chrome the default browser
- Some vendors opted out: Amazon, Xiaomi, Huawei, ZTE,
...

DIFFERENCES

```
<input type="datetime">
```

- Yes: HTC, LG, Samsung
- No: Google, Opera, Xiaomi, Cyanogen

DIFFERENCES

`border-radius: 3px;`

- Did not work on Samsung Chromium 18
- Reason: performance hit
- But this does: (forgot to remove)

`border-top-left-radius: 3px;`

...

DIFFERENCES

```
left: 0          /* is this the default value? */  
left: auto      /* or this? */
```

- 0: Samsung
- auto: all the others
- Default was changed between Chromium 28 and 30

DIFFERENCES: HOW TO DEAL WITH?

- Test each new Android phone carefully
- :)
- About 24'000 devices

Source: Heise Newsticker

OTHER BROWSERS

- Opera, Firefox, UC
- Most device vendors want Chromium though
- UC is doing fine, but only in China
- Opera Mini and UC Mini proxy browsers doing OK

MOBILE BROWSERS

SCORES	
current	
Score	Browser
518	Chrome 44 »
512	Opera Mobile 31 »
474	Firefox Mobile 40 »
468	Amazon Silk 3 »
452	Android 5.0 »
449	BlackBerry 10.3 »
445	Tizen 2.3 »
408	Jolla Sailfish »
405	iOS 8.0 »
346	Windows Phone 8.1 »
upcoming	
Score	Browser
409	iOS 9.0 »
401	Windows 10 »

- html5test.com/results/mobile.html
- rng.io (Facebook)

AD BLOCKER

- UC Browser for Android comes with preloaded AdBlock and other new features
- Browsen Sie mit Adblock Browser schnell, sicher und ohne störende Werbung
- Apple allows iOS ad blocking. Your move, Google!

AD BLOCKER

What's New in iOS 9.0

[...] Use the Content Blocking extension point to give Safari a block list describing the content that you want to block while your users are browsing the web. Source: developer.apple.com

Usage of advertising networks for websites

MOBILE FIRST

MOBILE FIRST

- Traditional Approach:
 - Start with desktop version
 - Then develop reduced mobile version
- Alternative:
 - Reduce to the essential from the beginning
 - Develop mobile first
 - Then bother with desktop version

MOBILE FIRST

Designing for mobile first forces you to embrace these constraints to develop an elegant mobile-appropriate solution. But the benefits go well beyond mobile.

Small screen sizes force you to prioritize what really matters to your customers and business.

[...]

Fueled by capable devices and faster networks, mobile internet usage is exploding. Building mobile first not only positions you to take advantage of this growth, it also opens up new opportunities for engaging your customers.

This isn't just an opportunity to create a mobile version of your web product; it's an opportunity to provide an improved overall experience for your customers.

Luke Wroblewski: Mobile First

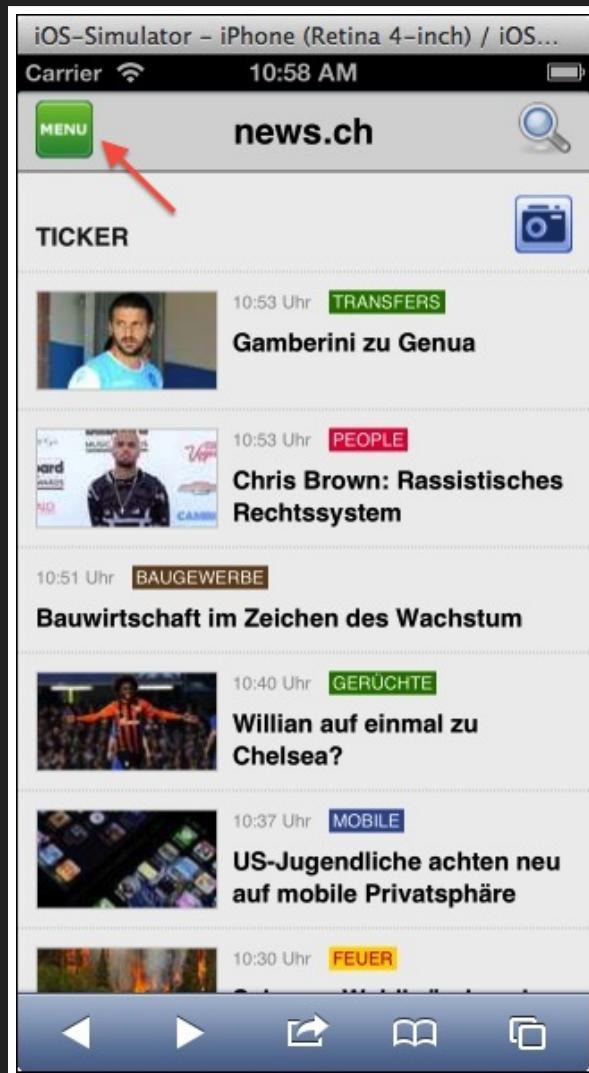
http://www.lukew.com/resources/mobile_first.asp

MOBILE WEB

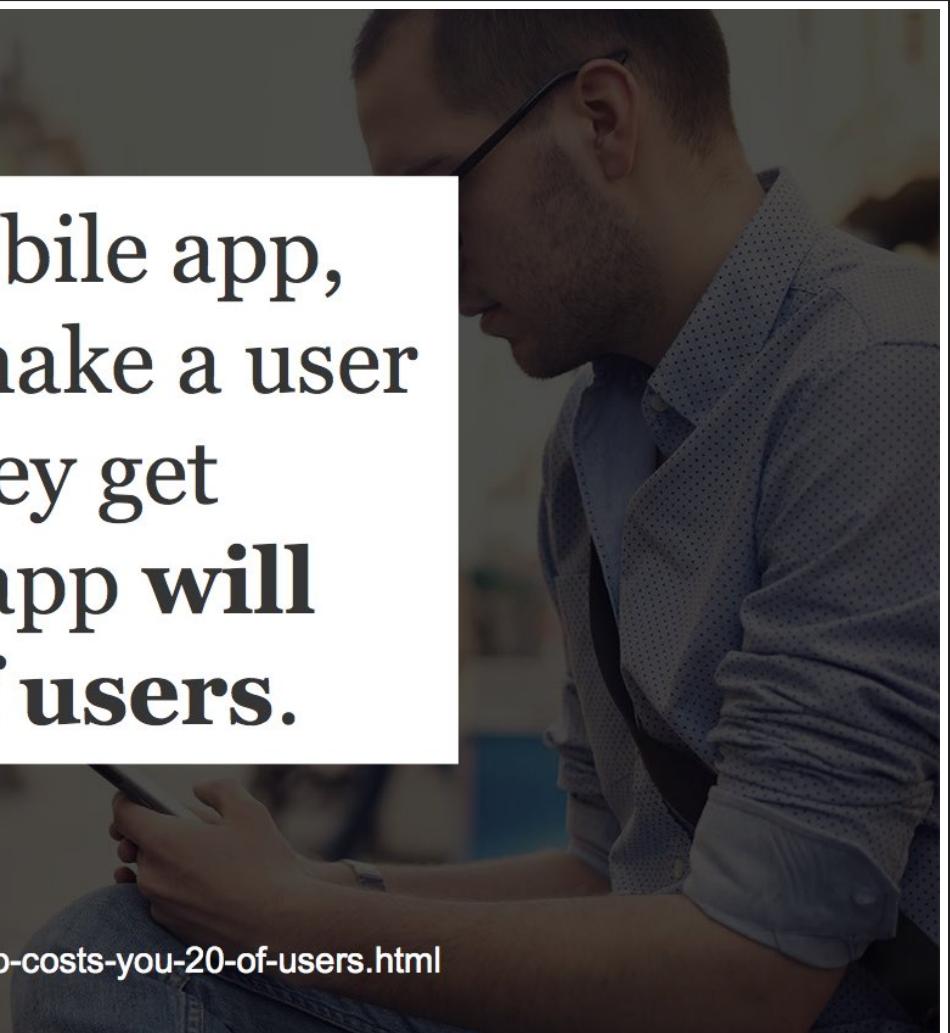
- Content or Navigation first?
- Back button available? (hardware, browser navigation)
- Navigation bar: top/bottom/sliding panel?
- Touch interface
- No mouse-over

↓ examples ↓

CONTENT FIRST



CONTENT FIRST



In a consumer mobile app,
every step you make a user
perform before they get
value out of your app **will**
cost you 20% of users.

<http://blog.gaborcselle.com/2012/10/every-step-costs-you-20-of-users.html>

CONTENT FIRST

iOS-Simulator – iPhone (Retina 4-inch) / iOS...

Carrier 11:10 AM

SBB CFF FFS

Meine Reise Freizeit Bahnhöfe Apps

Fahrplan

Von:

Nach:

Via:

Ab An



iOS-Simulator – iPhone (Retina 4-inch) / iOS...

Carrier 11:10 AM

DB BAHN

Home InfoService Login



>

>

>

>

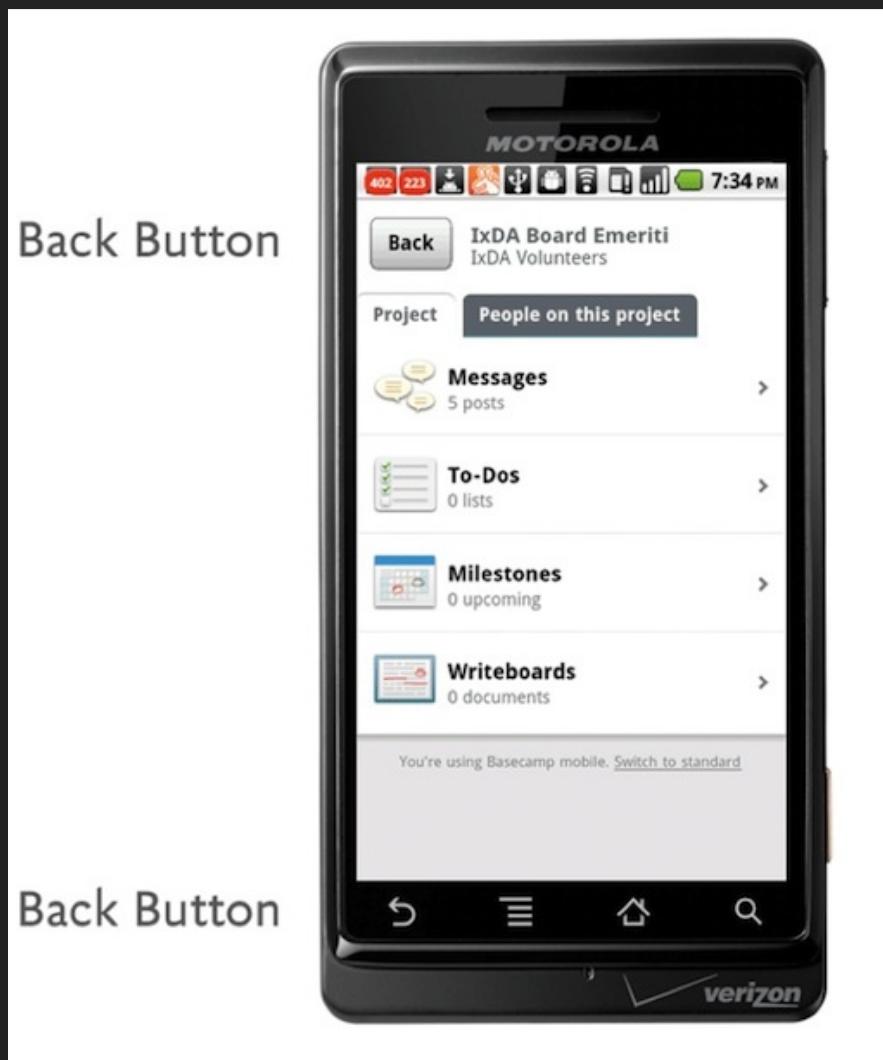
>

Verspätungs-Alarm

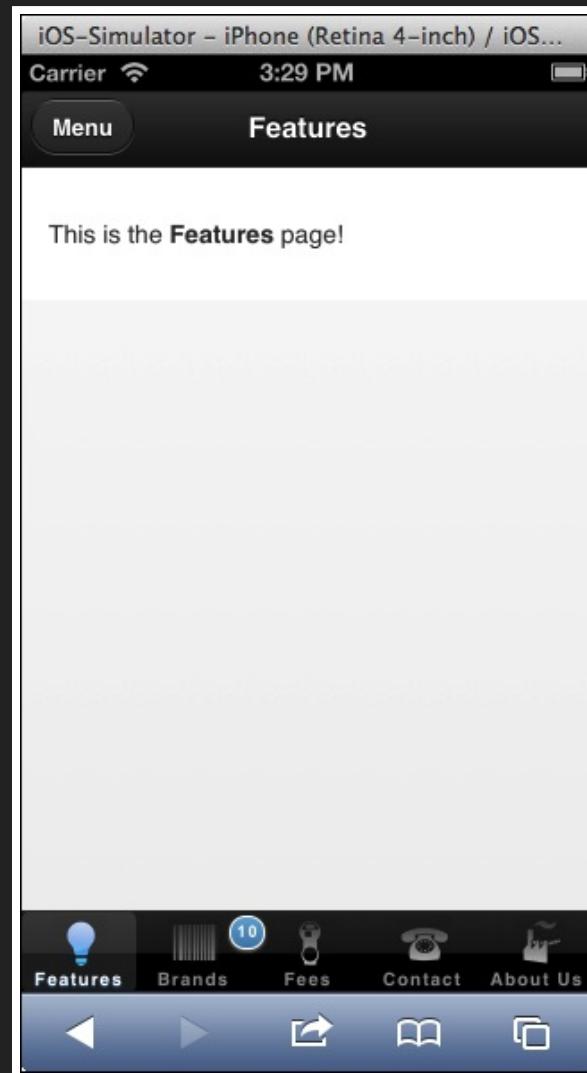
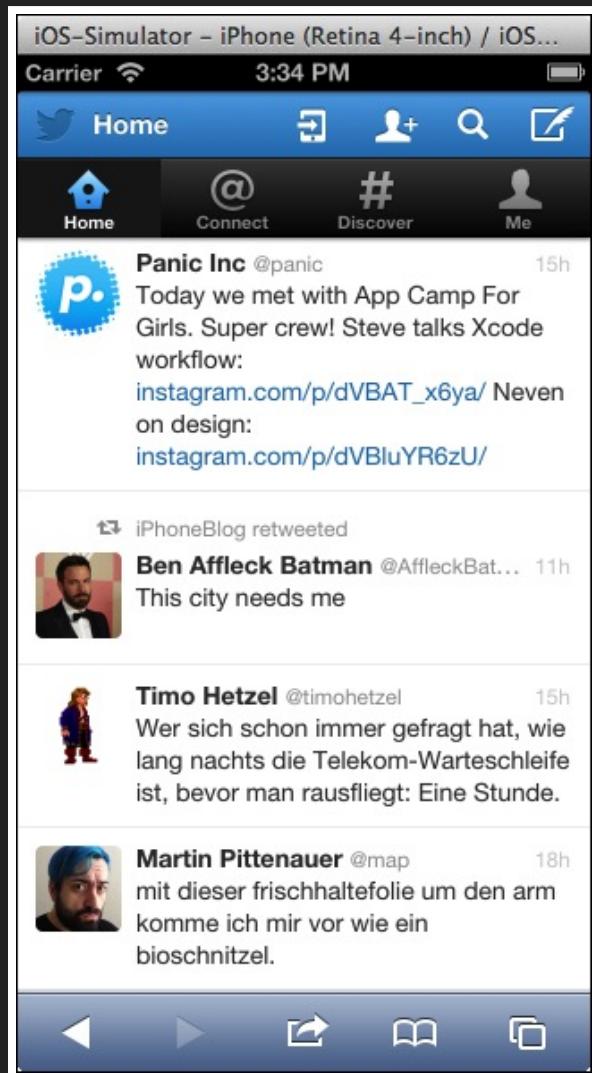
 • Verspätungs-Alarm auch für
regelmäßig genutzte Verbindungen!
Per E-Mail oder via Push-Nachricht



MOBILE WEB – BACK BUTTON



MOBILE WEB – NAVIGATION



MOBILE WEB – TOUCH CONTROL

- Larger controls needed
- Enough space between controls
- Not all regions on the screen equally reachable

MOBILE WEB – FORMS

- Little space for labels
- Often useful: `placeholder` attribute
- Important: appropriate `type` declaration for the `input` element
- Date picker with `<input type="date">`
- Extensive testing on various devices necessary

↓ examples ↓

MOBILE WEB – FORMS

iOS-Simulator – iPhone (Retina 4-inch) / iOS...
Carrier 12:50 PM

SBB CFF FFS

Meine Reise Freizeit Bahnhöfe Apps

Fahrplan

Von:

Nach:

Via:

Ab An

Erweiterte Suche

Abfahrt / Ankunft

Bahnverkehrsinformation

Fundservice

P+Rail

SBB Services

iOS-Simulator – iPhone (Retina 4-inch) / iOS...
Carrier 12:51 PM

DB BAHN

Von:

Nach:

Datum:

Uhrzeit:

Abfahrt Ankunft

Nur Nahverkehr

Reiseprofil: **1 Erw. 2. Klasse**

MOBILE WEB – FORMS

type="text"



Android Device

type="number"



Android Device

MOBILE WEB – FORMS

`type="email"`



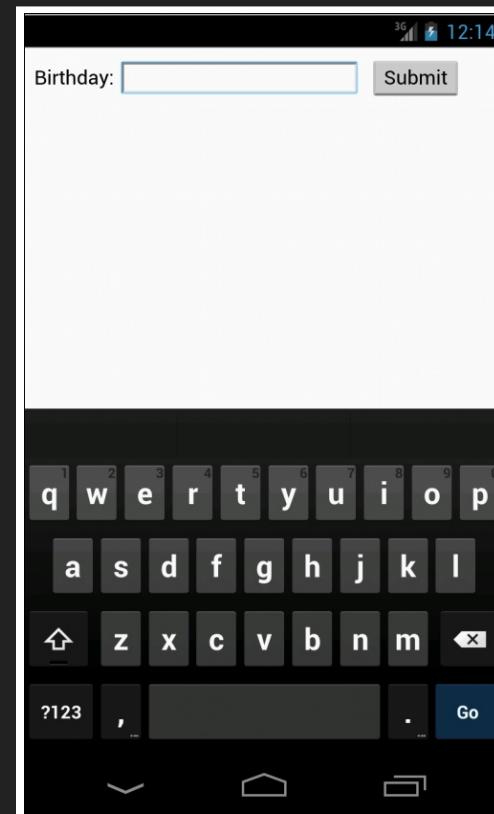
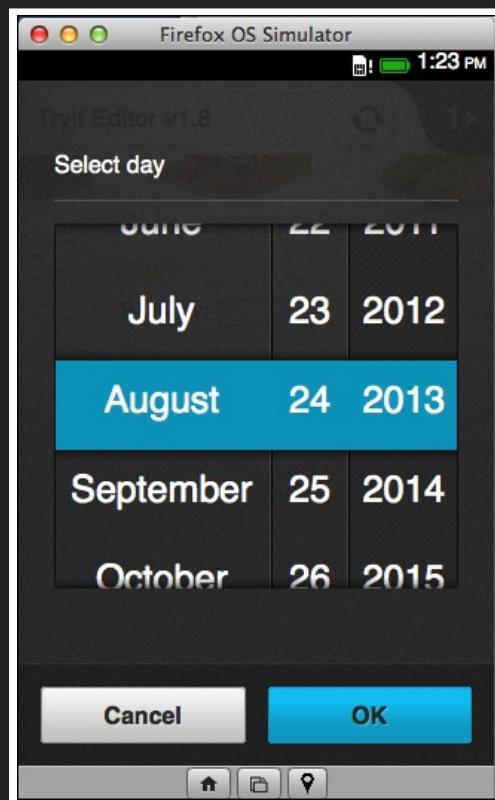
iPhone Device

`type="tel"`



iPhone Device

INPUT TYPE="DATE"



MOBILE WEB – ALSO RECOMMENDED

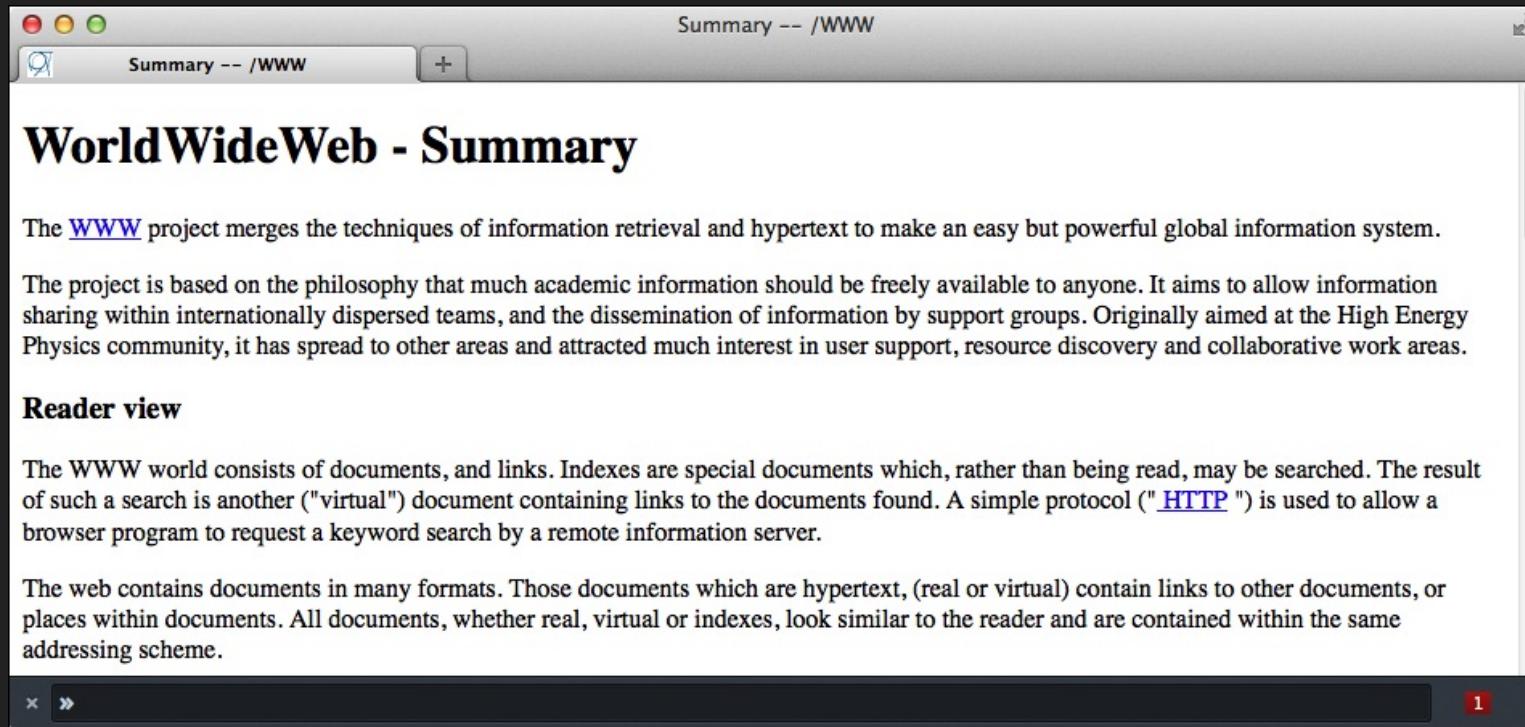
- Use image sprites
- Combine and minimize CSS
- JavaScripts, too
- Avoid big JavaScript libraries
- Appropriate settings for the HTTP header (cache, compression)
- Use HTML5-APIs like Appcache if possible
- Use CSS3 features instead of images (shadow, ...)

RESPONSIVE WEBDESIGN

DEVICE ADAPTION

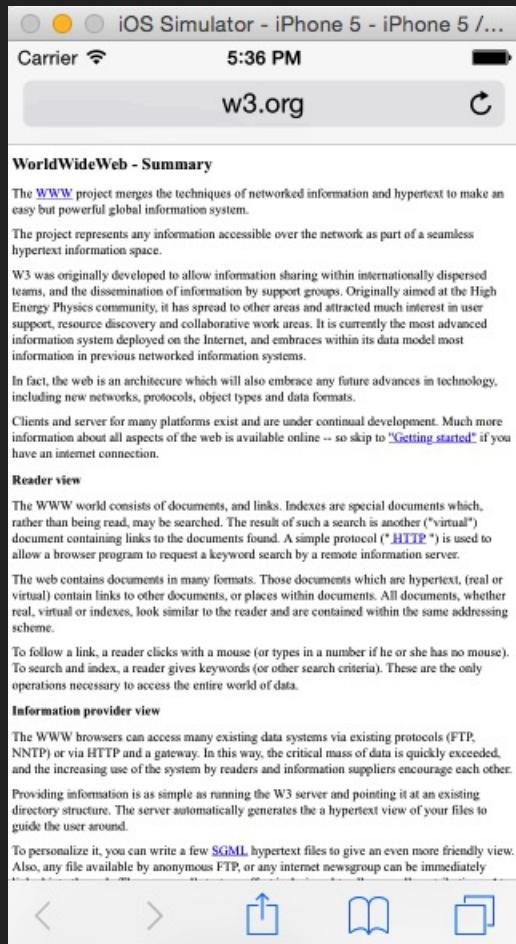
- Client Side Adaptation
 - Responsive Web Design
- Server-Side Adaptation
 - Device Databases
- Hybrid Adaptation
 - RESS - responsive web design with server-side components

WEBSITE FROM 1992 – RESPONSIVE?



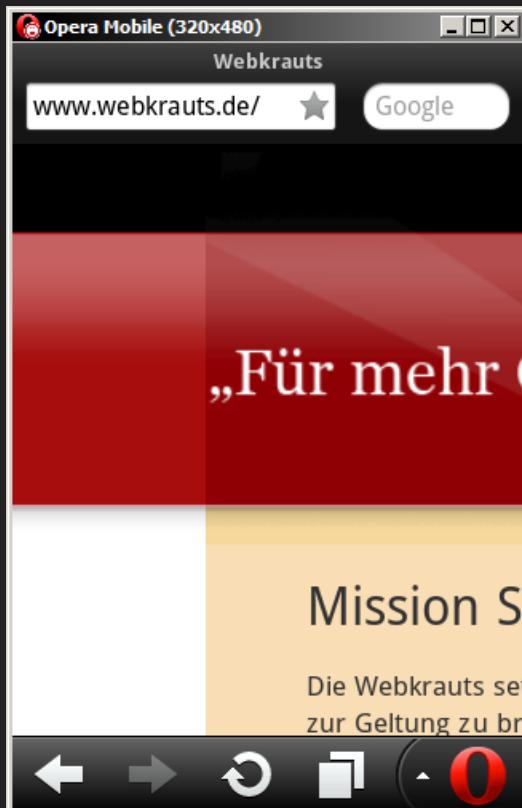
www.w3.org/Summary.html

RESPONSIVE, BUT...



- Mobile browser assumes a page width of about 960px
- And scales the page respectively...

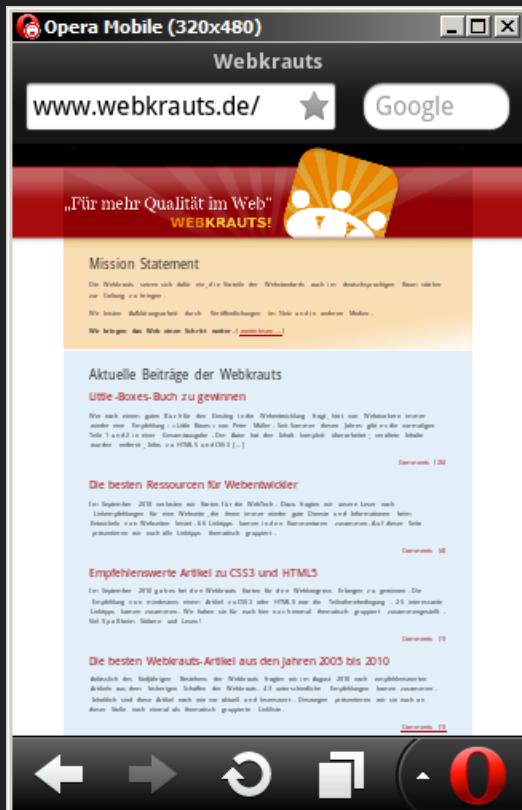
VIEWPORT



- Viewport: area of the browser in which the website is displayed
- Desktop websites typically assume a viewport width of 950px or more
- Less space available on smartphones, e.g. 320px width
- Scaling necessary for desktop optimized pages

VIEWPORT

- Same page scaled



VIEWPORT

- Desktop optimized website: scaling suitable
- Mobile optimized website: scaling harmful
- Viewport statement to the rescue...

```
<meta name="viewport" content="width=320">  
<meta name="viewport" content="width=device-width">
```

VIEWPORT

```
<meta name="viewport" content="?">
```

content value	meaning
width	viewport width
initial-scale	zoom factor when opening the page, default: 1
minimum-scale, maximum-scale	minimum and maximum zoom factor
user-scalable:no	user cannot scale the page

WEBSITE FROM 1992 – WITH VIEPORT STATEMENT

iOS-Simulator - iPhone (Retina 4-inch) / iOS...
Carrier 2:50 PM

WorldWideWeb - Summary

The [WWW](#) project merges the techniques of information retrieval and hypertext to make an easy but powerful global information system.

The project is based on the philosophy that much academic information should be freely available to anyone. It aims to allow information sharing within internationally dispersed teams, and the dissemination of information by support groups. Originally aimed at the High Energy Physics community, it has spread to other areas and attracted much interest in user support, resource discovery and collaborative work areas.

Reader view

The WWW world consists of documents, and links. Indexes are special documents which, rather than being read, may be searched. The

◀ ▶ ⌂ ⌂ ⌂

RESPONSIVE WEBDESIGN

Responsive web design (RWD) is an approach to web design aimed at crafting sites to provide an optimal viewing and interaction experience—easy reading and navigation with a minimum of resizing, panning, and scrolling—across a wide range of devices (from desktop computer monitors to mobile phones).

A site designed with RWD adapts the layout to the viewing environment by using fluid, proportion-based grids, flexible images, and CSS3 media queries, an extension of the @media rule, [...].

(Wikipedia)

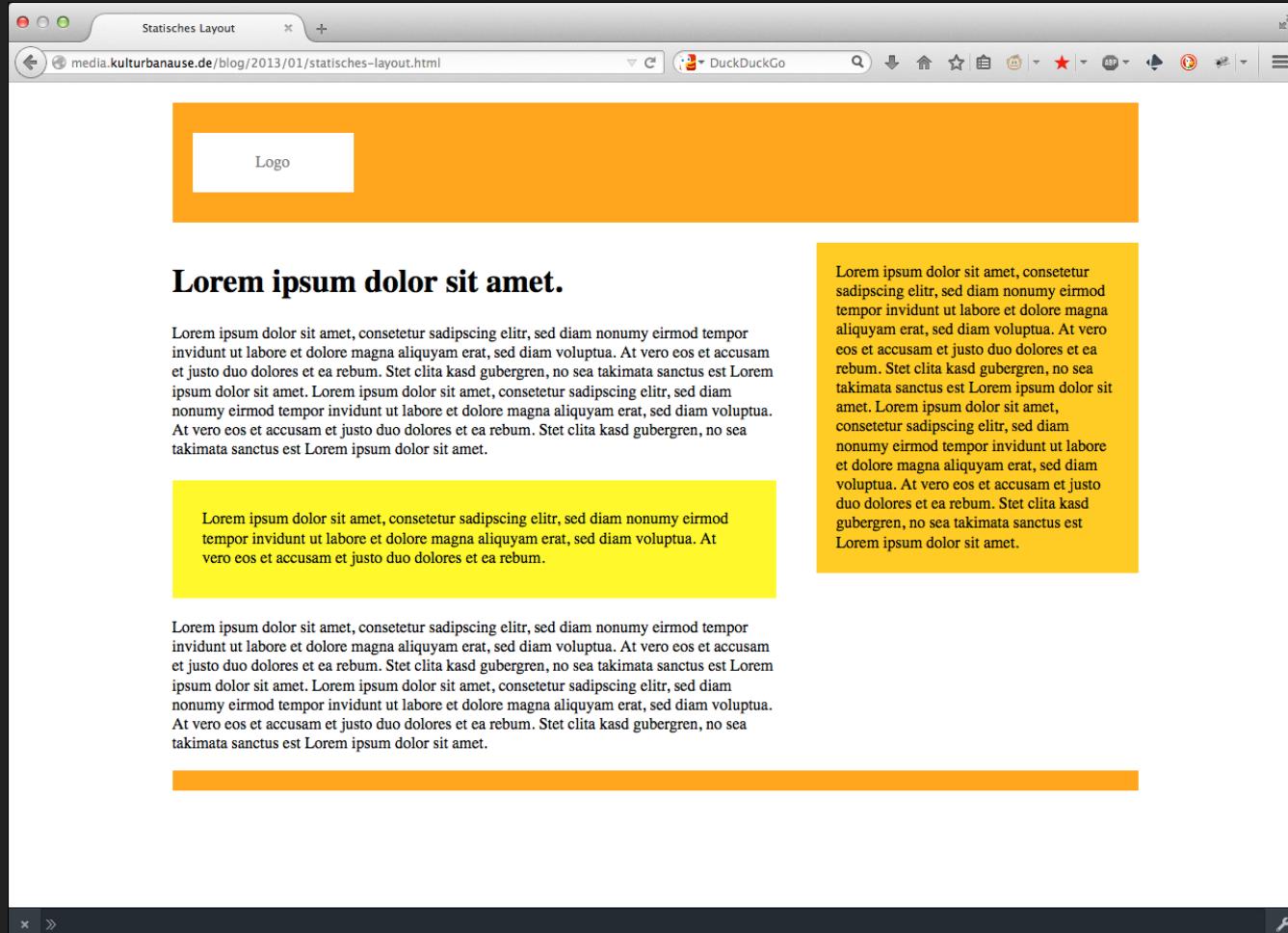
FIXED LAYOUT

- Fixed width overall and of individual elements
- Often centered
- Cropped if viewport is too small

```
#container {  
    margin: 0 auto;  
    width: 960px;  
}
```

↓ preview ↓

FIXED LAYOUT



<http://media.kulturbanause.de/blog/2013/01/statisches-layout.html>

FLUID LAYOUT

- Layout and container width adjusts to viewport width
- Main container with `max-width` (or percentage)
- Other sizes in percent
- Tool to calculate percentages: <http://rqrwd.com>

```
#container {  
    max-width: 960px; /*...*/  
}  
aside {  
    width: 29.16666667%; /* 280/960x100 */  
    padding: 2.08333333%; /* 20/960x100 */  
}
```

↓ preview ↓

FLUID LAYOUT



<http://media.kulturbanause.de/blog/2013/01/fluessiges-layout.html>

FLUID LAYOUT

- Images should not stick out of the surrounding container

```
img {  
    max-width: 100%;  
}
```

- But:
 On small viewports the fluid layout is barely usable, too
- In that case the layout needs to be adjusted
- Tool: *CSS3 Media Queries*

CSS3 MEDIA QUERIES

```
<link rel="stylesheet" media="screen and (max-width: 400px)"  
      href="small.css">
```

```
@import url(small.css) screen and (max-width: 400px);  
@media screen and (max-width: 400px) { ... }
```

↓ more examples ↓

CSS3 MEDIA QUERIES

```
@media all and (min-width:500px) {}
@media (min-width:500px) {}
@media not screen and (color) {}
@media only screen and (color) {}
@media print and (min-width: 25cm) {}
@media screen and (min-width: 400px) and (max-width: 700px) {}
@media screen and (device-width: 800px) {}
@media screen and (device-height: 600px) {}
@media all and (orientation: portrait) {}
@media all and (orientation: landscape) {}
@media screen and (device-aspect-ratio: 16/9) {}
@media print and (min-resolution: 300dpi) {}
@media tv and (scan: progressive) {}
@media tv and (scan: interlace) {}
```

RESPONSIVES WEBDESIGN

- Use media queries to adjust layout to the device's capabilities
- Example: blocks side by side if sufficient viewport width is available, one above the other otherwise

```
@media screen and (max-width: 480px) {  
    .column {  
        float: none;  
    }  
}
```

RESPONSIVE WEBDESIGN

- Ethan Marcotte: Fluid Grids
- Ethan Marcotte: Responsive Web Design

Examples

- <http://3200tigres.wwf.fr>
- <http://2012.buildconf.com>
- <http://alistapart.com/d/responsive-web-design/ex/ex-site-larger.html>
- <http://finecitizens.com/defineResponsive/>

MOBILE DISPLAY RESOLUTIONS

Device	Resolution
Typical desktop monitor	90-100 ppi
Original iPhone	164 ppi
Nexus One	266 ppi
iPhone 4	329 ppi
iPhone 6+	401 ppi
Nexus 5	445 ppi
Nexus 6	493 ppi

WHAT IS A PIXEL?

- According to the CSS 2.1 specification px is an absolute unit:

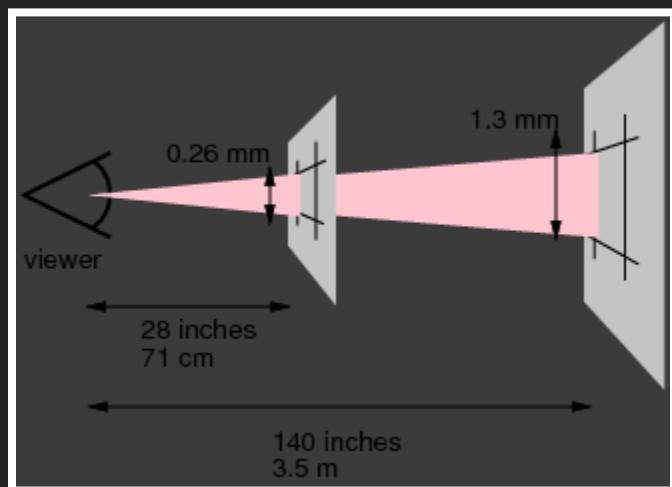
unit	description
pt	points — the points used by CSS are equal to 1/72nd of 1in
px	pixel units — 1px is equal to 0.75pt

- But: user agent can define the actual size
- Print: based on physical units like cm
- Screen: based on a *reference pixel*

REFERENCE PIXEL

The *reference pixel* is the visual angle of one pixel on a device with a pixel density of 96dpi and a distance from the reader of an arm's length. ([CSS 2.1 specification](#))

- Size of 1px based on this reference pixel
- Seems to be the same size
- Actually sizes can differ considerably



CSS PIXEL

- Screen size of 1px is based on the reference pixel
- Units like `cm` are calculated based on this pixel size
- The actual size of a CSS `cm` on a screen may differ from the common length unit *cm*
- Opera Mobile on HTC Desire: 1 CSS pixel equals 1.5 screen pixels
- iPhone with a retina display: 1 CSS pixel equals 2 screen pixels

IMAGE RESOLUTION

- Example: JPEG 300x300px
- Placed on a website in a 300x300px box (CSS pixels)
- Capabilities of HD displays given away

Possibilities:

- Provide image in higher resolution, scale in browser
- Background image: provide various resolutions
- Use scalable images (SVG, icon fonts)
- When browsers support it: `srcset` attribute

FINAL REMARKS

BEST PRACTICE

Ten best practices from a UX perspective for small- and medium-sized businesses to drive conversion (store visit, call or purchase):

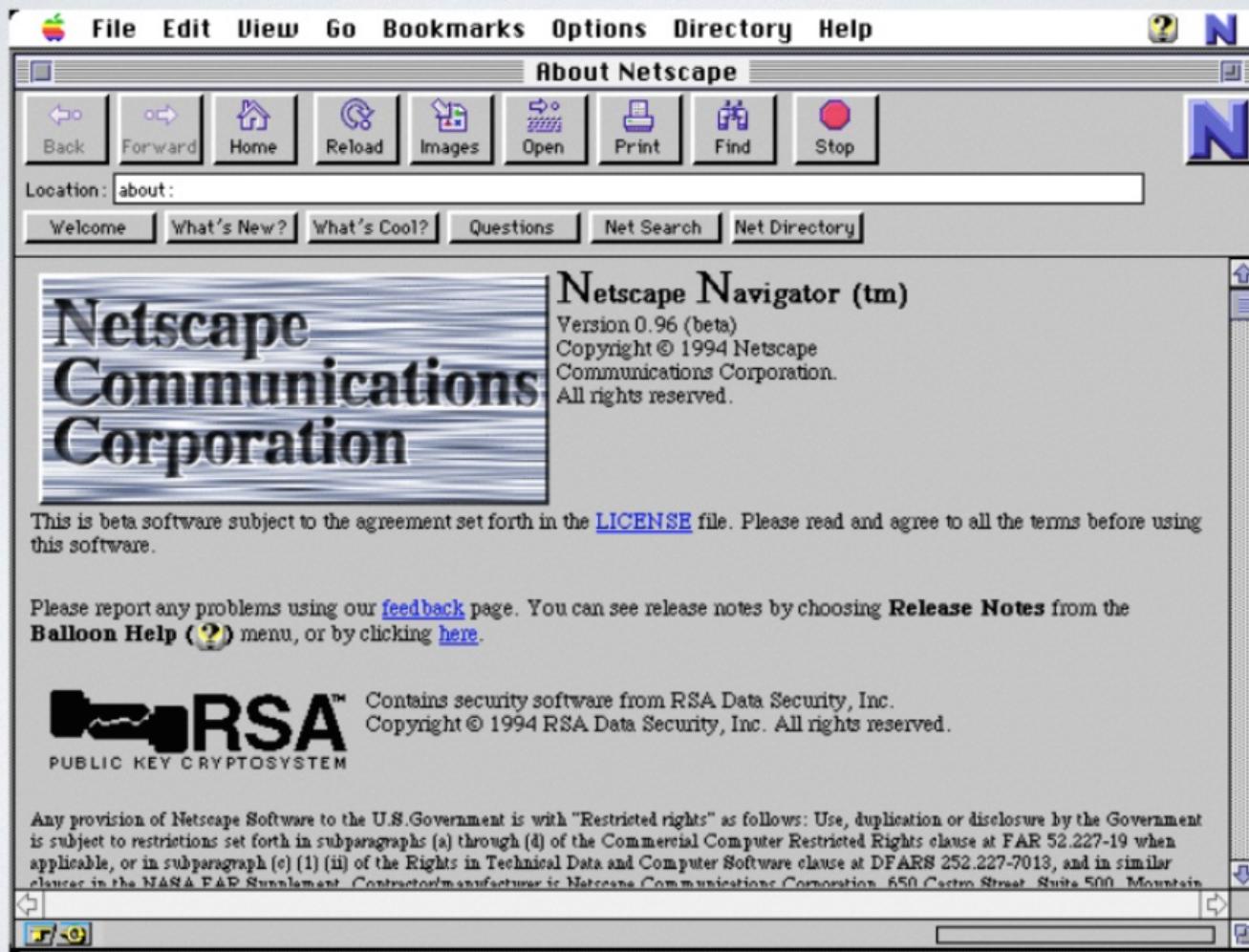
- Be thumb friendly - design your site so even large hands can easily interact with it
- Design for visibility - ensure your content can be read at arm's length
- Simplify navigation - clear navigation, hierarchy and vertical scrolling aid access to information
- Make it accessible - ideally, your mobile site should work across all mobile devices and all handset orientations
- Make it easy to convert - focus on information that will aid conversion

↓ more ↓

- Make it local - including functionality that helps people find and get to you
- Use mobile site redirects - give users a choice to go back to the desktop site, but make it easy to return to the mobile site
- Keep it quick - help mobile users, design your site to load faster and make the copy easy to scan
- Make it seamless - bring as much of the functionality of your desktop site to mobile
- Learn, listen and iterate - good mobile sites are user-centric, meaning they're built with input from your audience.

(Source: [Mobile Search Moments Webinar by DudaMobile & Google, Youtube](#))

This scaled pretty well



This didn't

The screenshot shows the classic Yahoo! homepage. At the top, there's a navigation bar with icons for 'New', 'Cook', 'YAHOO!', 'Sports', and 'Finance'. Below the bar, a banner reads 'YAHOO! CELEBRATE AND WIN' with a link to 'HOLIDAY EXTRAVAGANZA CLICK HERE'. There's also a 'Weekly Picks' section. A search bar and 'Options' button are present. The main content area lists various categories: Arts and Humanities, Business and Economy, Computers and Internet, Education, Entertainment, Government, Health, News and Media, Recreation and Sports, Reference, Regional, Science, Social Science, and Society and Culture. At the bottom, links include 'Yahooligans!', 'Yahoo! Shop', 'Yahoo! Internet Life', 'Daily Picks', 'Random Yahoo! Link', 'Weekly Picks', 'National Yahoos', 'Yahoo! Metros', and footer links for 'How to Include Your Site', 'Company Information', and 'Community Outreach Calendar'.

- [Arts and Humanities](#) - [Architecture](#), [Photography](#), [Literature](#)...
- [Business and Economy \[Xtra!\]](#) - [Companies](#), [Investments](#), [Classifieds](#)...
- [Computers and Internet \[Xtra!\]](#) - [Internet](#), [WWW](#), [Software](#), [Multimedia](#)...
- [Education](#) - [Universities](#), [K-12](#), [College Entrance](#)...
- [Entertainment \[Xtra!\]](#) - [Cool Links](#), [Movies](#), [Music](#), [Humor](#)...
- [Government](#) - [96 Elections](#), [Politics \[Xtra!\]](#), [Agencies](#), [Law](#), [Military](#)...
- [Health \[Xtra!\]](#) - [Medicine](#), [Drugs](#), [Diseases](#), [Fitness](#)...
- [News and Media \[Xtra!\]](#) - [Current Events](#), [Magazines](#), [TV](#), [Newspapers](#)...
- [Recreation and Sports \[Xtra!\]](#) - [Sports](#), [Games](#), [Travel](#), [Autos](#), [Outdoors](#)...
- [Reference](#) - [Libraries](#), [Dictionaries](#), [Phone Numbers](#)...
- [Regional](#) - [Countries](#), [Regions](#), [U.S.](#), [States](#)...
- [Science](#) - [CS](#), [Biology](#), [Astronomy](#), [Engineering](#)...
- [Social Science](#) - [Anthropology](#), [Sociology](#), [Economics](#)...
- [Society and Culture](#) - [People](#), [Environment](#), [Religion](#)...

[Yahooligans!](#) · [Yahoo! Shop](#) · [Yahoo! Internet Life](#)
[Daily Picks](#) · [Random Yahoo! Link](#) · [Weekly Picks](#)
[National Yahoos](#) · [Canada](#) · [France](#) · [Germany](#) · [Japan](#) · [U.K. and Ireland](#)
[Yahoo! Metros](#) · [Chicago](#) · [Los Angeles](#) · [New York](#) · [San Francisco Bay Area](#)

[How to Include Your Site](#) · [Company Information](#) · [Community Outreach Calendar](#)

THINK ABOUT / DISCUSS ...

Aren't Web directories somewhat like App Stores?

PUSHING THE WEB FORWARD

Pushing the web forward currently means cramming in more copies of native functionality at breakneck speed — interesting stuff, mind you, but there's just too much of it.

Quick, name all the new features browsers shipped in 2015! You see? You can't. That's the problem.

We get ever more features that become ever more complex and need ever more polyfills and other tools to function — tools that are part of the problem, and not of the solution.

(Peter-Paul Koch: [Stop pushing the web forward](#))

PUSHING THE WEB FORWARD

- New web standards and APIs appear at an amazing rate
- Trying to catch up with native features?

Web Applications traditionally assume that the network is reachable. This assumption pervades the platform. HTML documents are loaded over HTTP and traditionally fetch all of their sub-resources via subsequent HTTP requests. This places web content at a disadvantage versus other technology stacks.

Source: Service Workers, W3C Draft

caniuse.com: Service Workers

PUSHING THE WEB FORWARD

- Apple is criticized for its slow adoption of new web standards
- Nolan Lawson: [Safari is the new IE](#)
- Or: Does Apple has a different vision of progress?

If you're a MacBook user, you're losing an average of 1 hour of total battery life by using Chrome. Firefox is a little better, but Safari is the clear winner. You'll want to use Safari if you want to get the most battery out of your laptop.

PUSHING THE WEB FORWARD

Peter-Paul Koch: Stop pushing the web forward:

I want a moratorium on new browser features for about a year or so.

THINK ABOUT / DISCUSS ...

- What do you think about pushing the Web forward?
- Could a moratorium help prioritizing and deciding on further work?

READING MATERIAL, SOURCES

READING MATERIAL

- Google Developers: Optimierung von Websites für Mobilgeräte
<https://developers.google.com/webmasters/mobile-sites/>
- Fluid Grids (Ethan Marcotte, A List Apart)
<http://alistapart.com/article/fluidgrids>
- Responsive Web Design (Ethan Marcotte, A List Apart)
<http://alistapart.com/article/responsive-web-design>

SOURCES

- Slides and other material from courses WEB1, WBE
- Mobile Developer's Guide To The Galaxy, 15th Edition, Enough Software,
http://www.enough.de/index.php?id=mobile_developers_guide
- Organizing Mobile (Luke Wroblewski)
<http://alistapart.com/article/organizing-mobile>
- Mobile First (Luke Wroblewski, A Book Apart)
<http://www.abookapart.com/products/mobile-first>
- The plural of Chromium is Chromia, Peter-Paul Koch,
http://quirksmode.org/presentations/Spring2015/chromia_bt.pdf
- Media Queries (W3C Recommendation)
<http://www.w3.org/TR/css3-mediaqueries/>

SOURCES

- Building better with the mobile web, GDG Keynote, Paul Kinlan, Google, https://docs.google.com/presentation/d/1WLi-_iHgFitgxaQLSDoC5eVDABR_9yCWWgpMfZQM8Mw/edit#slide=id.g518e34c0a
- Mobile is eating the world, Benedict Evans, 2013, <http://de.slideshare.net/bge20/2013-11-mobile-eating-the-world>
- Mobile, context and discovery, Benedict Evans, keynote at the InContext 2014 conference, <http://de.slideshare.net/bge20/2014-02-incontext>, Youtube: <https://www.youtube.com/watch?v=VnhbvS0MBXE>