

# ***Technologies for the upcoming web: Standards for the next web platform***

***Jboye 2010  
Aarhus 2010-11-03***

***Olle Olsson  
World Wide Web Consortium (W3C)  
Swedish Institute of Computer Science (SICS)***

# Contents

- Web, technology, standards, standardization
- CSS3
  - What's new?
- HTML5
  - What's new?
- Complementary technologies
  - Examples

# What's our future?

- Web 1.0
- Web 2.0
- Web ~~3.0~~ ~~4.0~~ 5.0: Improving the Web platform
  - Web of Data
  - Web of Interaction
  - Web of Applications



# Shaping the Web's user interface

- Enhancing the first-generation Web language, HTML
- Integrating second-generation Web languages
  - CSS: give some style to your page
  - SVG: let's play with graphics
  - MathML: how to display Math on the Web?
  - Video, Canvas, Geolocation, ...
- Making it reactive
  - Interactivity and user-oriented functionality
- Use local resources
  - APIs to client platform functionality
  - Utilising mobile platforms

# The Next Open Web Platform

- HTML 5
- CSS 2.1
- CSS 3 Selectors
- CSS 3 Media Queries
- CSS 3 Text
- CSS 3 Backgrounds and Borders
- CSS 3 Colors
- CSS 3 2D Transformations
- CSS 3 3D Transformations
- CSS 3 Transitions
- CSS 3 Animations
- CSS 3 Multi-Columns
- CSS Namespaces
- SVG 1.1
- WAI-ARIA 1.0
- MathML 2.0
- ECMAScript 5
- 2D Context
- WebGL
- Web Storage
- Indexed Database
- Web Workers
- Web Sockets Protocol/API
- Geolocation
- Server-Sent Events
- Element Traversal
- DOM Level 3 Events
- Media Fragments
- XMLHttpRequest
- Selectors API
- CSSOM View Module
- File API
- RDFa
- Microdata
- WOFF
- HTTP 1.1 part 1 to part 7
- TLS 1.2 (updated)
- IRI (updated)
- ...

# *A fundamental step forward*

- HTML for the original web
  - Web of documents (HTML + CSS)
  - Navigation (HTTP)
- HTML for the new web
  - Web with applications
  - Support for programmed behavior
  - Support for sets of data
  - Delegation of work to client machine
- New types of devices
  - Mobile devices
  - TVs; in-cars; ...

# *The HTML5 space*

- HTML5 in the narrow sense
  - The specification titled “HTML5”
- HTML5 in the wider sense
  - The HTML5 language as framework
  - CSS2/CSS3, SVG, MathML
  - The additional specialised technologies
    - Storage, threads, fonts, geolocation, ...
- Perspectives from different roles:
  - User
  - Author
  - Implementor
  - Specifier



# “A Word from our Sponsor”



# World Wide Web Consortium (W3C)

- W3C (World Wide Web Consortium)
  - The web standards organization Consortium



- Consortium 350 member organisations
- Founded 1994
- Creating web standards (“W3C Recommendations”)
  - HTML, CSS, SVG, RDF, PNG, MathML, XML, WCAG, EXI...

# *Open standardisation process*

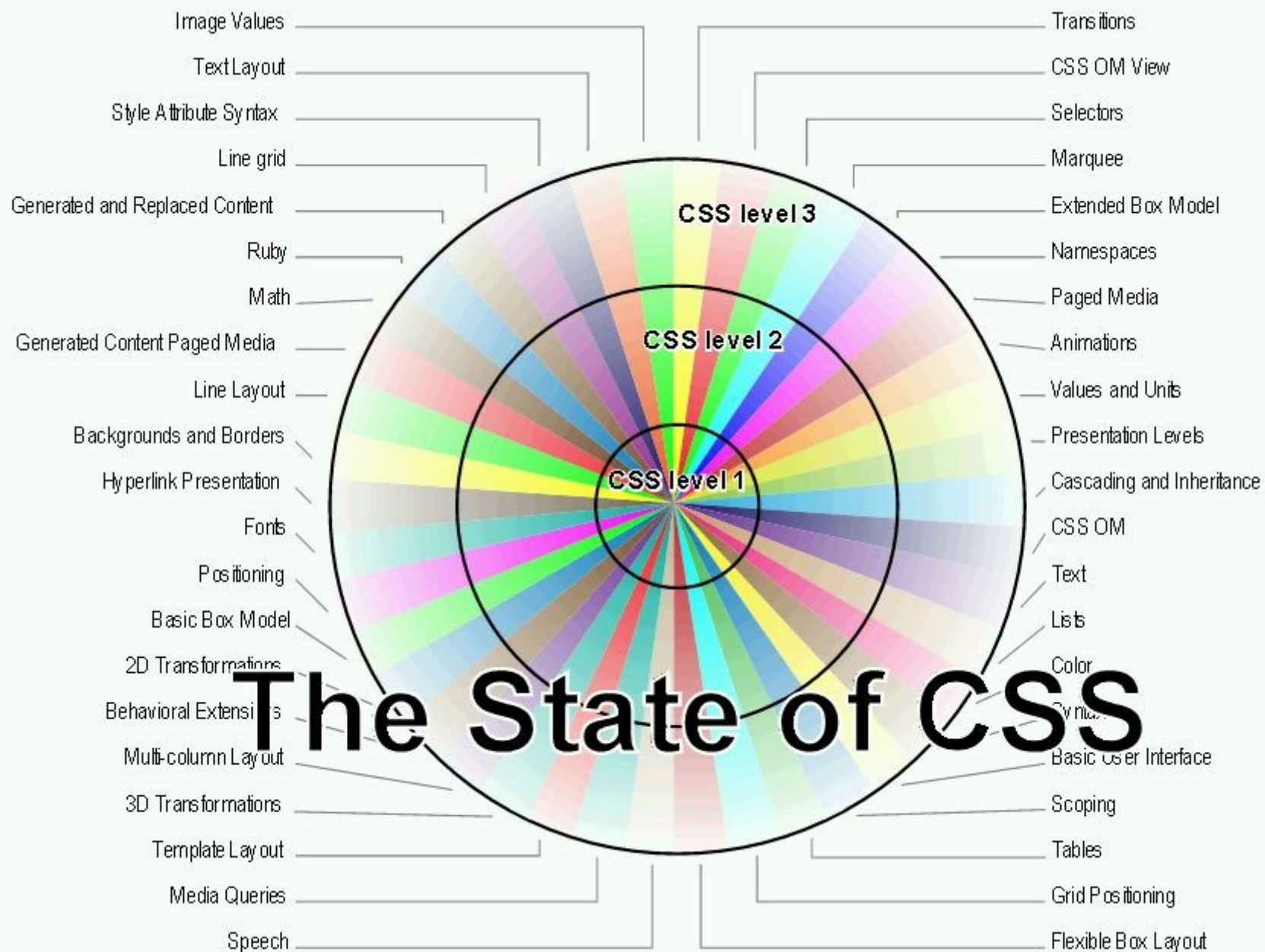
- Requirements driven and needs driven
  - Use cases, business needs, ...
- Proposals exposed to the world
- Comments and feedbacks incorporated
- HTML Working Group handles work on HTML 5
  - ... in collaboration with WHATWG
- Consensus in working group
  - Stakeholders are driving it
- Drivers: market; use; and technology

# Challenges to standardisation

- Compatibility between standards
  - Combining web technologies
    - Combining standards
  - HTML + CSS; HTML + MathML; XHTML + Xquery; ...
- Compatibility across generations of a standard
  - Keep old stuff? How to shape new stuff?
  - HTML3 => HTML4 => HTML4.01 => HTML5
- HTML5 defined to:
  - integrate other standards
  - be "backwards compatible" & tolerant

# CSS / CSS3

# CSS – the big picture



# *The State of CSS*

- The Working Group is active
- ... but has a lot to do
- Wrap up of CSS 2.1
- CSS implementations are looking into deploying more of CSS 3
- Major work: testing the specifications

# CSS state: *Stable & proven*

## Stable & proven

- CSS level 1
- Selectors
- ...



# CSS state: *Stable & implementing*

## Stable & being implemented – examples

- CSS level 2
- CSS Namespaces
- CSS Backgrounds and Borders [css/demo]
- CSS Multicolumn Layout
- Paged Media
- Color
- Media Queries
- Mobile Profile

# *CSS state: Almost stable*

## Almost stable – examples

- Template Layout
- 2D Transformations
- Transitions
- ...

# *CSS state: Not stable*

## Not stable

- Tables, Lists, Positioning, Generated & Replaced Content, Image Values, 3D Transformations, Fonts, Text Layout...

... apart from the properties that already in level 2

# CSS 3 Selectors

- :first-child, :last-child, :nth-child(3), :nth-child(odd)

Date	Description	Depositption	Transfer	Withdrawal	Balance
10/08/2004	Restaurant	Expenses:Foods		38.14	440.67
10/10/2004	Market	Expenses:Groceries		123.14	317.53
10/11/2004	Gas	Expenses:Car		40.00	277.53
10/12/2004	Payroll	Income:Salary	2,000.00		2277.53
10/12/2004	Home depot	Expenses:House Supplies		41.14	2236.39
10/14/2004	Dentist	Expenses:Medical		166.20	2070.19
10/15/2004	Electricity	Expenses:Utilities		27.88	2042.31
10/16/2004	Filene's Basement	Expenses:Grooming		31.93	2010.38

# CSS3 Borders

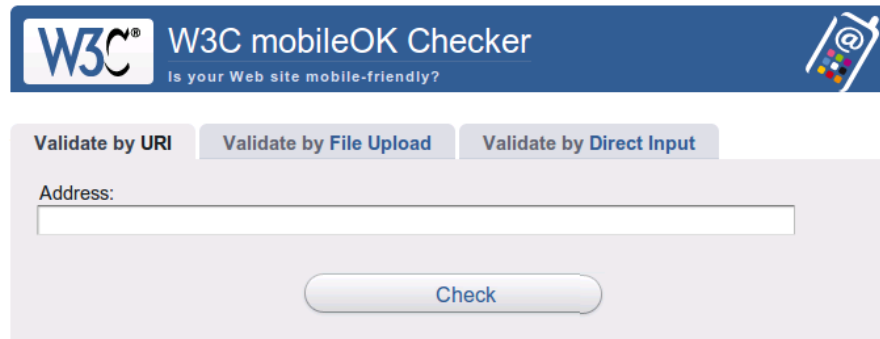


*We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.*

*(Preamble of the United States of America Constitution)*

# CSS Media Queries

```
<link rel="stylesheet" type="text/css" href="base.css" />
<style type="text/css" media="screen and (min-width: 481px)">
  @import url("advanced.css");
</style>
<link rel="stylesheet" type="text/css" href="base.css"
  media="handheld, only screen and (max-device-width:
480px)" />
```




This checker performs various tests on a Web Page to determine its level of mobile-friendliness. The tests are defined in the [mobileOK Basic Tests 1.0](#) specification. A Web Page is **mobileOK** when it passes all the tests. Please refer to the [About](#) page for more details. If you wish to validate specific content such as [markup validation](#), or [RSS/Atom feeds](#), or [CSS stylesheets](#), or to [find broken links](#), there are [other validators and tools](#) available.

## ONLINE TRAINING SESSIONS

Want to learn more about mobile Web design?

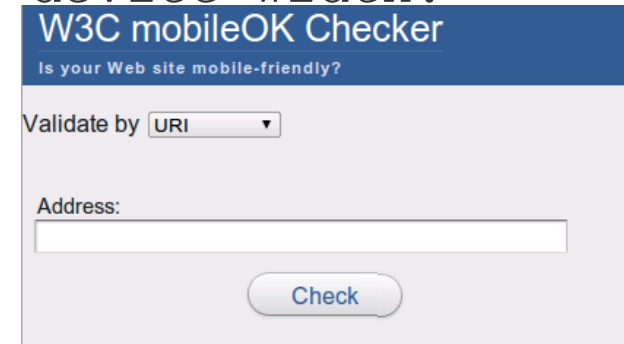
Attend one of our online training sessions on Mobile Web Best Practices!

[Check it out!](#) 

## SPONSORS



[Become a MWI Sponsor](#) - see [Sponsors testimonials](#)




This checker performs various tests on a Web Page to determine its level of mobile-friendliness. The tests are defined in the [mobileOK Basic Tests 1.0](#) specification. A Web Page is **mobileOK** when it passes all the tests. Please refer to the [About](#) page for more details. If you wish to validate specific content such as [markup validation](#), or [RSS/Atom feeds](#), or [CSS stylesheets](#), or to [find broken links](#), there are [other validators and tools](#) available.

## Online training sessions

Want to learn more about mobile Web design?

Attend one of our online training sessions on Mobile Web Best Practices!

[Check it out!](#) 

# CSS Examples

## *Simple illustrations*

- *Background, borders ... visual decorations*
- *Media queries ... adapting to screen*
- *Transitions/hover ... dynamic behavior*



# HTML5

# HTML 5: Quick history

- 2004:
  - Opera, Mozilla, and Apple creates the WHAT WG
- 2007:
  - W3C restarts the HTML Working Group
- 2008:
  - January First Public Working Draft
- 2010:
  - Apple, Google, Mozilla, Microsoft, and Opera (and others) are implementing, or are committed to, HTML 5
  - Working Drafts: March, June, October

# HTML5 – approach

- Principle: correct HTML4 pages remain correct
- Goal: many incorrect pages still work, too
- New elements
- New attributes



# HTML 5: HTML or XML?

- Two serializations
  - HTML serialization (`text/html`)
  - XML serialization (`application/xhtml+xml`)
- Incorporates SVG and MathML
- Incorporates DOM Core and DOM HTML

# *New high-level structure elements*

- `<section>`, `<article>`
- `<aside>` – replaces `<div class=sidebar>`
- `<hgroup>` – allows to create subtitles
- `<header>` – frontmatter of a book/article
- `<footer>` – colophon
- `<nav>` – table of contents, breadcrumbs, etc.
- `<figure>`, `<figcaption>`

# *New phrase-level elements*

- `<math>` – with MathML inside
- `<svg>` – with SVG inside
- `<audio>`, `<video>`, `<embed>` – replaces `<object>`, `<img>`, `<applet>`
- `<mark>` – an alternative for `<em>`
- `<time>` – date or time, for  $\mu$ formats
- `<ruby>`, `<rp>`, `<rt>` – ruby for CJK

## *New elements for “DHTML”*

- `<progress>` – of a process, e.g. “60%”
- `<meter>` – measurement along a scale, e.g., “\*\*\*”
- `<canvas>` – blank rectangle, for script to draw on
- `<menu>`, `<command>` – menu/toolbar
- `<output>` – to be filled with text by script
  
- `<menu>` already existed, as more or less an alias for `<ul>`



# *New form elements*

- `<details>`, `<summary>` – collapsible dialog
- `<datalist>` – combobox
- `<keygen>` – generates public/private key pair
- `<input type=tel>` – telephone number
- ... `type=search` – as text, but may look different
- ... `type=url`, `email`, `datetime`, `date`, `month`, `week`, `time`, `datetime-local`, `number`, `color`
- ... `type=range` – analog number input

# New attributes (1/2)

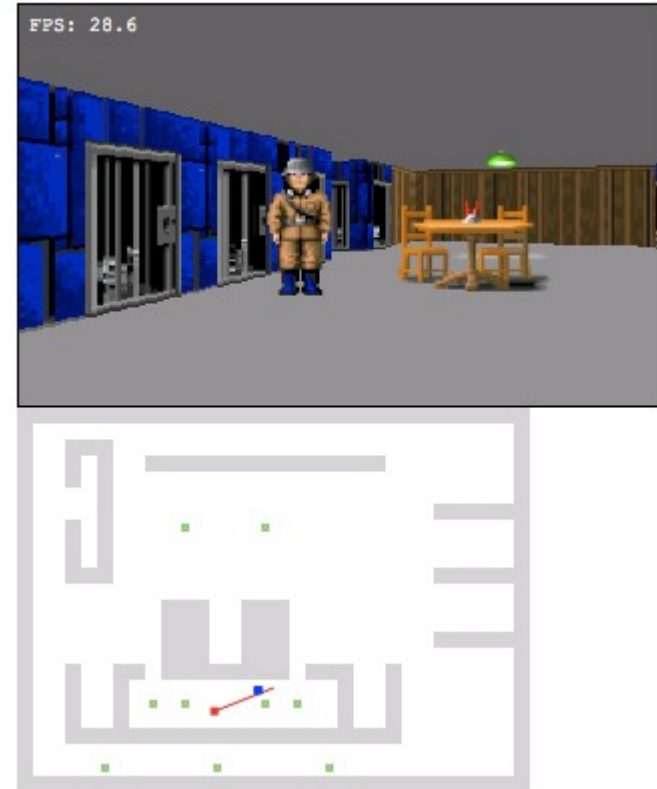
- `<input autofocus>`
- `<input placeholder="...">` – hint shown inside an empty input
- `<input form=ID>` – allows to put element outside form
- `<input required>`
- `<input min= max= step= pattern= >` – constraints
- `<ol reversed>` – count down

## *New attributes (2/2)*

- `<iframe seamless>` – render with intrinsic height instead of 150px
- `<contenteditable >` – a bit like textarea
- `<data-* >` – guaranteed non-standard attributes
- `<role= aria* >` – restore accessibility of incorrectly used elements
- `<input spellcheck>` – indicate that spellchecking is not useful

# Canvas

- 2D drawing space
- Scripted manipulation
- Dynamic contents



Demo examples: [html5](#)

# HTML 5.0 <video>

- `<video src='myMovie' id='myVideoElement' />`
- .....



*Demo [html5/video.html](http://html5/video.html)*

# Reasonable Requirements for a Video codec

- Known not to require per-unit or per-distributor licensing
- Compatible with the open source development model
- Of sufficient quality as to be usable
- Not an additional submarine patent risk for large companies
- Compatible with W3C Royalty-Free policy
- .....

None of the codecs fit the requirements for HTML 5?

# Codecs and formats

Format Container: .avi, .mp4, .mov, .ogg, .flv, .mkv, etc.

**Video codec:**

H.264,  
VP8,  
Theora,  
Dirac 2.1,  
H.263,  
etc.

**Audio codec:**

AAC,  
WMA,  
Vorbis,  
PCM,  
etc.

**Captioning,  
Video description:**

SAMI, SMIL,  
Hi-Caption,  
CMML, DFXP,  
3GPP TS 26.245,  
MPSub,  
etc.

**Metadata:**

MPEG-7,  
CableLabs,  
TV-ANytime,  
EBU,  
XMP,  
etc.

# Codec implementations

## HTML5 VIDEO CODECS

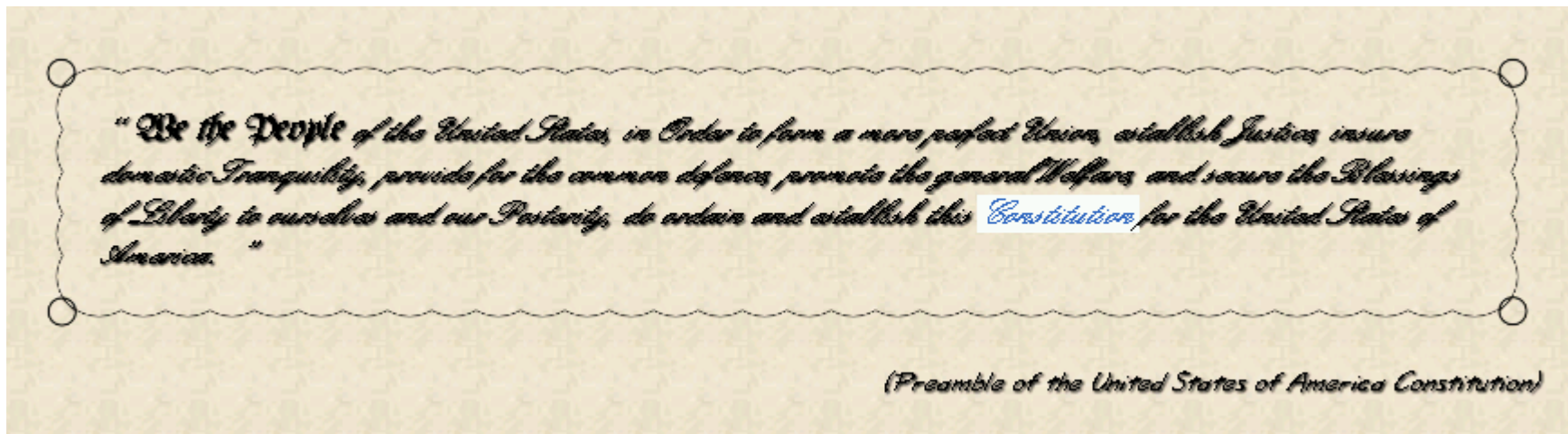
	MAC					WIN										
	 CHROME	 FIREFOX	 OPERA	 SAFARI		 CHROME	 FIREFOX		 OPERA	 SAFARI	 IE					
	5	3.6	10.6	5	4	5	6	3.6	4.02	10.6	5	6	7	8	9	
Video: ogg	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	68%
Video: H.264	✓	✗	✗	✓	✓	✓	✓	✗	✗	✗	✓	✗	✗	✗	✓	34%
Video: WebM	✗	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	12%



# Technologies in HTML5 space

# Fonts: WOFF File Format

- Web Open Font Format
- Already available
- Adaptation of existing font packaging
- Opens up new design / branding opportunities



## *... and many others*

- Geolocation ... use geographical position (mobile!)
- Web applications ... small things on your desktop
  - Newsfeeds, ticker tapes, weather, timetables, ...
- Offline web applications ... working when not online
- Web workers ... threads for independent processing
- Web sockets ... bi-directional, full-duplex communications
- Device APIs ... calendar, contacts, camera, files, sensors, ...

What does it all mean?

# Summary

- Improved open web platform
- HTML5 as a framework
  - Integrating other web technologies
- Simplified web content development
  - Better match to 80% of needs
- Simplified web application development
  - Standardised technologies
- Improved portability
  - Standards conforming implementations

Thank you for your attention!