

HTML5 & CSS3 - nytt lyft för webben

*DFS/Västra
Göteborg 2010-09-21*

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

Contents

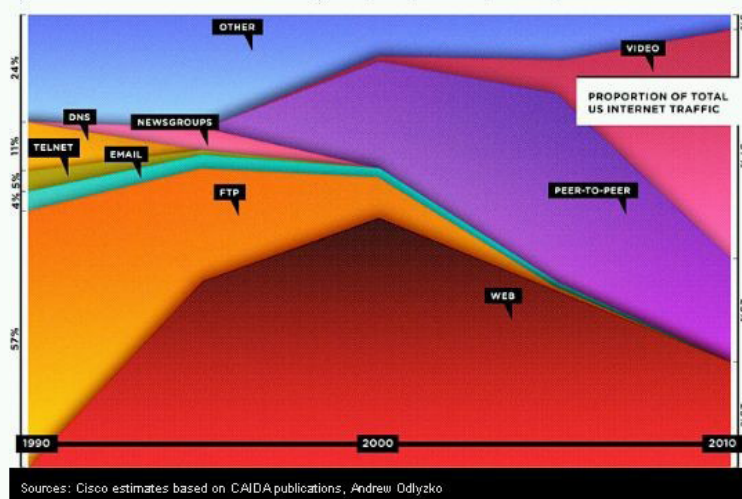
- Web, technology, standards, standardization
- CSS3
 - What's new?
- HTML5
 - What's new?
- Complementary technologies
 - Examples

Some current rumours

Web ... Dead?

The Web Is Dead. Long Live the Internet

By Chris Anderson and Michael Wolff  August 17, 2010 | 9:00 am | Wired September 2010



No!

- The web: formats, protocols, links, ...
- ... and the web browser (but not necessarily)

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



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, ...

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)
- ...

World Wide Web Consortium (W3C)

- W3C (World Wide Web Consortium) is a Standards Organization organized as a Consortium



- Founded 1995
- Web standards
 - HTML, CSS, SVG, RDF, PNG, MathML, XML, WCAG, EXI...
- Its standards are called W3C Recommendations
- They are made by Working Groups

W3C Working Groups

- The W3C Consortium has members
 - Industry
 - Research
 - Public sector
- Work is performed in Working Groups
 - Staffed by personnel from member organisations
- W3C staff – the “Team”
 - Coordinates work
 - Support functions
- W3C web standards
 - Agreed and supported by major stakeholders

Open standardisation process

- Proposals exposed to the world
- Comments and feedbacks incorporated
- Requirements and needs driven
 - Use cases, business needs, ...
- Consensus in working group
 - All agree
- Open standards
 - Copyright: Open access; free to copy
 - Patents: none, or royalty free (as far as possible)

Additional forms of work

- Interest groups
- Incubator groups
- Coordination groups

- Workshops

- Liaisons (other “standards bodies”)
 - IETF, ISO, Open Mobile Alliance, ICTSB (European board of ICT standards organizations), ETSI, etc

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

Evolving versions – examples

- **name** attribute:
 - vs. <p id=...>
- Positioning in visual rendering
 - Floating text flow ... absolute ... “floating” (HTML5)
- Links
 - HREF vs. XLink
- Embedding external application
 - APPLET ... OBJECT ... EMBED

Alternatives? Redundancies?

- CSS vs XSL
- HTML (+ microformats) vs RDF
- Media Queries vs server-side adaptation
- HTML's <audio>/<audio> vs SMIL

Scope ... allocation?

- CSS image manipulation
- Let CSS set size of image? – obvious yes
 - Since level 1 (fg), since level 3 (bg)
- Let CSS rotate image? – maybe yes
 - Planned for level 3: 'transform'
- Let CSS create images (e.g., gradients)? – maybe no
- Let CSS blur, enhance, colorize, etc.? – no

Not everything in CSS! Other technologies may be better suited for certain functionality!

CSS3

The State of CSS

- The Working Group is still active
- ... but has a lot to do
- Trying to wrap up CSS 2.1
- CSS implementations are looking into deploying more of CSS 3
- Major issue with testing the specifications
-

CSS 3 Selectors

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

Date	Description	Deposition	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

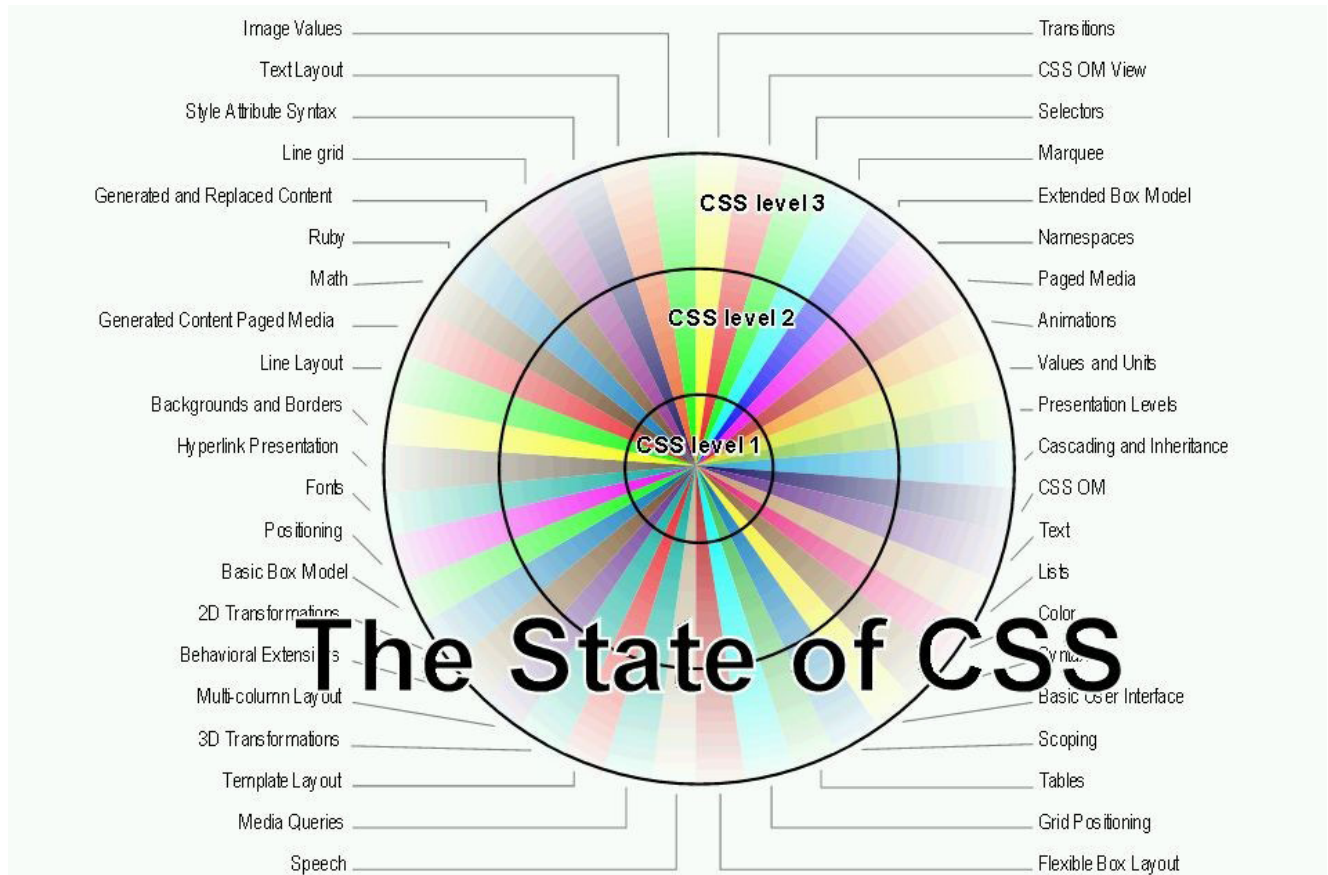


We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the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

(Preamble of the United States of America Constitution)

CSS

CSS – the big picture



CSS state: Stable & proven

Stable & proven

- CSS level 1
- Selectors
- ...

•

CSS state: Stable & implementing

Stable & being implemented

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

CSS state: Almost stable

Almost stable

- Paged Media
- Color
- Template Layout
- 2D Transformations
- Transitions

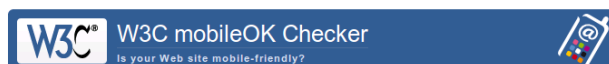
CSS state: Not stable

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 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="advanced.css" media="handheld, only screen and (min-width: 480px)" />`



W3C mobileOK Checker
Is your Web site mobile-friendly?

Validate by **URI** | Validate by File Upload | Validate by Direct Input

Address:

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



OPEN MOBILE TERMINAL PLATFORM
Become a MWI Sponsor - see [Sponsors testimonials](#)

W3C mobileOK Checker
Is your Web site mobile-friendly?

Validate by **URI**

Address:

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!](#)

HTML5

HTML 5: Quick history

- Effort started by Ian Hickson, while working at Opera
- 2004: Opera, Mozilla, and Apple creates the WHAT WG
- 2007: W3C restarts the HTML Working Group
- 2010: Apple, Google, Mozilla, Microsoft, and Opera (and others) are implementing, or are committed to, HTML 5
-



HTML5 – approach

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

HTML 5: HTML or XML?

- Enables HTML serialization (`text/html`) and XML serialization (`application/xhtml+xml`)
 - Note: Polyglot documents are documents that can be served as HTML or XML.
- Incorporates SVG and MathML
- Incorporates DOM Core and DOM HTML
-

New high-level structure

- `<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>`, ``, `<applet>`
- `<mark>` – an alternative for ``
- `<time>` – date or time, for μ 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 ``

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>` [maybe a bad idea?]
- `<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

HTML 5.0 `<video>`

- `<video src='myMovie' id='myVideoElement' />`
-
-
- Demo html5/video.html

HTML 5 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:

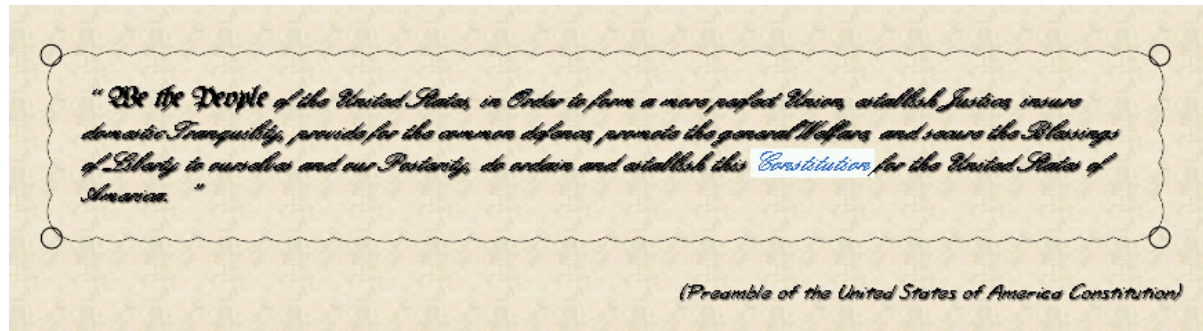
MPEG-7,
CableLabs,
TV-ANYtime,
EBU,
XMP,
etc.

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	✗	✗	✓	✗	✗	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	1%

Other related technologies

Fonts: WOFF File Format



The State of SVG

- SVG 1.1 released in 2001 and SVG 1.2 released in 2009
- SVG 1.1 is included in HTML 5
- Opera supports SVG 1.1/1.2
- Firefox and Webkit supports most of SVG 1.1 (more or less)
- We're getting there but more work is needed for interop
- Microsoft announced support for SVG in March 2010
- Authoring tools are getting better (e.g. Inkscape)

2D Context

- Using `<canvas>` element

```

interface CanvasRenderingContext2D {
  [...]
  void scale(in float x, in float y);
  void rotate(in float angle);
  void translate(in float x, in float y);
  CanvasGradient createLinearGradient(...);
  CanvasPattern createPattern(in HTMLElement element,
                              in DOMString repetition);
  void strokeRect(in float x, in float y, in float w, in
float h);
  void moveTo(in float x, in float y);
  void strokeText(...);
};

```

XHTML5/SVG Video Player



Geolocation API

- Geographical information
- Device-specific mechanisms
- Targeted at Web Applications



Widgets: Web Applications on your desktop ...

The screenshot shows a desktop environment with a blue background. On the left, there are icons for 'Trash', '/windows (23.3 GB)', and 'teale'. The main area contains several widgets:

- Twitter widget:** Displays a tweet from a user with a profile picture. The tweet text is: "Rescinded XHTML PER. We'll need to do a better job next time." Below the tweet are navigation options: "Recent", "Mentions", "Direct", "Archive", "Near", "Search".
- Yahoo! Finance widget:** Displays a table of stock market data. The table has columns for Symbol, Last Trade, Change, and Trend. The data is as follows:

Symbol	Last Trade	Change	Trend
^DJI	8294.68	-1.51%	
^NYA	5785.46	-1.45%	
^GSPC	890.22	-1.47%	
IBM	102.31	-1.67%	
CSCO	18.164	-2.34%	
WFMI	19.93	-1.92%	
VTSMX	22.11	-0.50%	
VGTSX	11.76	+1.03%	
VEURX	21.31	+1.04%	
EURUSD=X	1.3794		
- dotool widget:** A small utility window titled "dotool - Default" with a list of checkboxes:
 - Fontws XG Charter
 - Minutes of W3C/IETF meeting
 - Add metadata to video player

SVG and Canvas

Scalable Vector Graphics

- SVG 1.1 released in 2001 and SVG 1.2 released in 2009
- SVG is included in HTML5
- Most modern mobile browsers have some support for SVG
- SVG is big... interoperability problems are frequent
- WebKit includes support for SVG and is at the basis of many mobile browsers.

Canvas

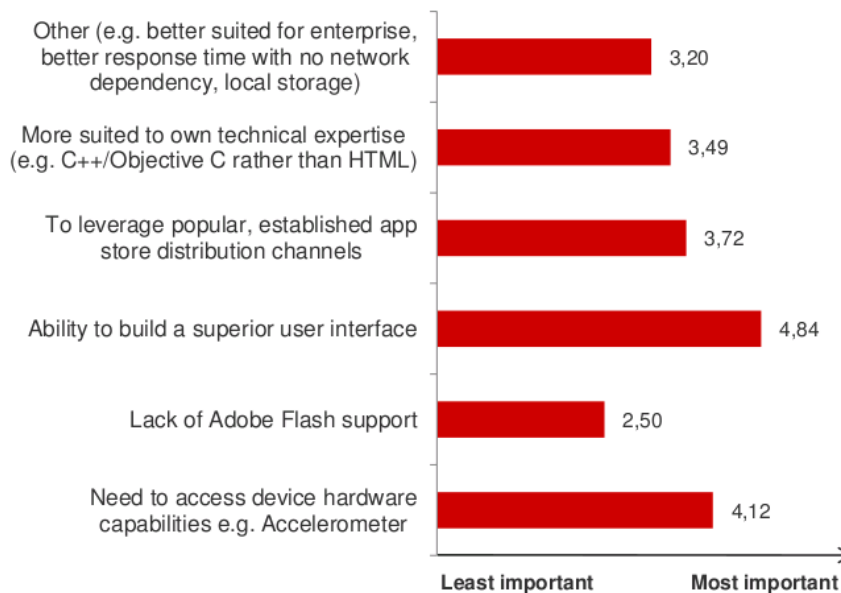
Still recent, but supported by most modern mobile Web browsers:

- Safari on iPhone
- Android browser
- WebOS browser
- Opera Mobile
- ...

Towards Web Applications

- Web vs native
- Integration with device quoted as one of the main limitations of Web apps

Top reasons for only offering a native application (Total: 36)



Source: GIA native vs. web industry survey, Feb-Mar 2010

Offline Web Applications

Offline HTML application declaration:

```
<!DOCTYPE HTML>
<html manifest="page.manifest">
  [...]
</html>
```

Manifest file:

```
CACHE MANIFEST
index.html
styles.css
img1.png
img2.png
```

Coming to a mobile browser close to you. Already there on Safari for iPhone and Android browsers.

Web Workers

- Xx
- `<script>`
- `var worker = new Worker('task.js');`
- `worker.onmessage = function (event) {`
- `var result = event.data;`
- `// do something with result`
- `};`
- `</script>`
-
- In task.js:
-
- `// do the task`
- `[...]`
- `postMessage(theTaskResult);`
-

Web Sockets: Protocol and API

- Using HTTP 1.1 Upgrade directive and subject to origin constraints
- ```
interface WebSocket {
 // e.g. "ws://example.com/app34"
 readonly attribute DOMString URL;
 [...]
 readonly attribute unsigned long bufferedAmount;
 attribute Function onopen;
 attribute Function onmessage;
 attribute Function onclose;
 boolean send(in DOMString data);
 void close();
};
```

## Device APIs

- Desktop computers, laptop computers, mobile internet devices (MIDs), cellular phones, etc.
- Calendar, Tasks, Contacts, Camera, Messaging (SMS, email), System information, Filesystem, etc.
- framework for the expression of security policies
-

# Device APIs



What does it all mean?

## Summary

- Improved open web platform
- HTML5 as a framework
  - Integrating other web technologies
- Simplified web content/application development
- Improved portability
  - Standards conforming implementations
- 

Thank you for your attention!