HTML5 technologies

Ework

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Contents

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

file:///C:/Documents%20and%20Settings/olleo/Skrivbord/G-processes/w3c/demos/%C3%ADndex.html

What's the future?

- Web 1.0 – HTML & HTTP
  - Access to contents; ...
- Web 2.0 – Ajax
  - Create content; interactivity; ...
- Web X.0 {X > 2} – Web platform
  - Devices; …
  - Web of Data
  - Web of Interaction
  - Web of Applications

Web platform – main drivers

- Economic: infrastructure investment; cost-effective creation/construction; ...
- Reach: usable everywhere; ...
- Stable: works today and tomorrow; ...

and ...

- New platforms: mobile; embedded; …
- Expectations: user experience; technology up-take
- Competition: technology control; proprietary, ...

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)
- ...

Web Platform and the HTML5 space

- HTML5 in the narrow sense
  - The specification titled “HTML5” – *HTML* & *XHTML* !
- HTML5 in the wider sense – “Open Web Platform”
  - The HTML5 language as framework
  - CSS2/CSS3, SVG, MathML
  - 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

W3C WORLD WIDE WEB consortium

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

Open standardisation process

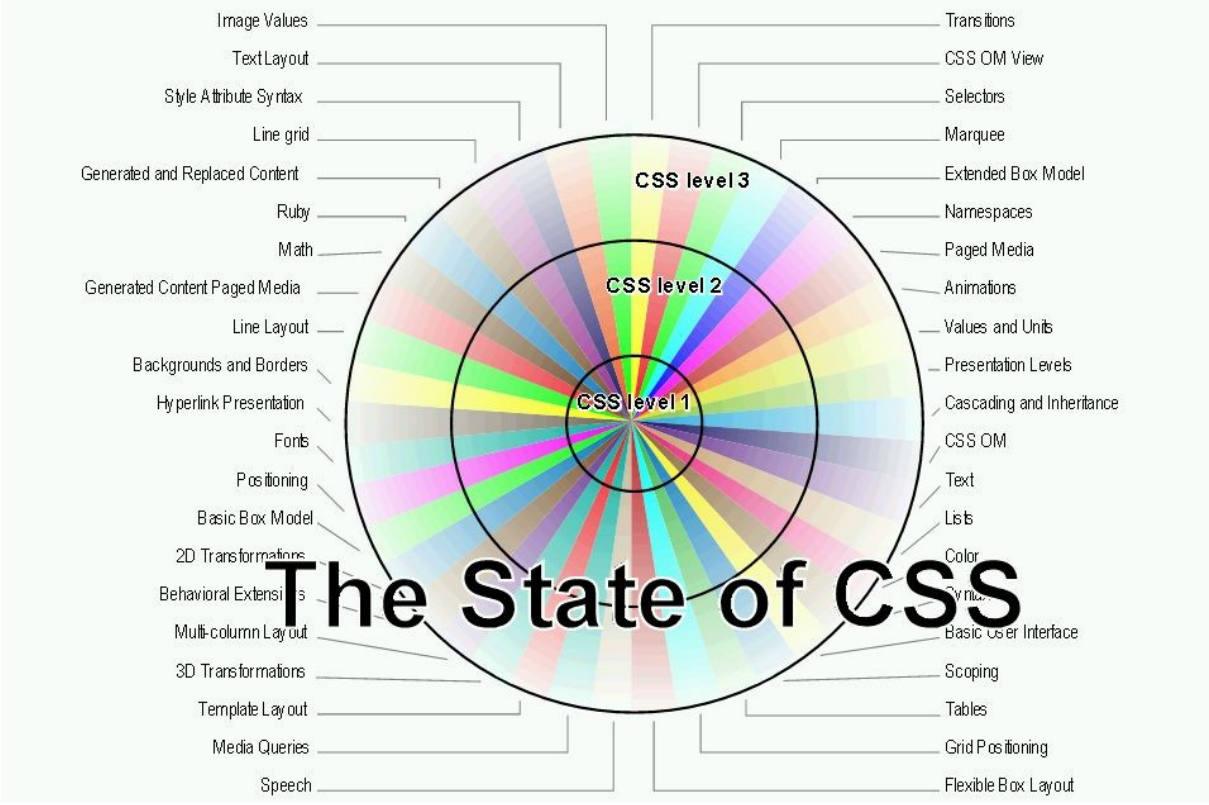
- Requirements driven and needs driven
  - Use cases, business needs, …
- Proposals exposed to the world
- Comments and feedbacks incorporated
- HTML Working Group handles work on HTML5
  - … in collaboration with WHATWG
  - Done as collaboration between IT companies
- Consensus in working group
  - 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?
  - HTML 3 => HTML 4 => HTML 4.01 => HTML 5
- HTML5 defined to:
  - integrate other standards
  - be ”backwards compatible” & tolerant

CSS / CSS3

CSS – the big picture



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 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…

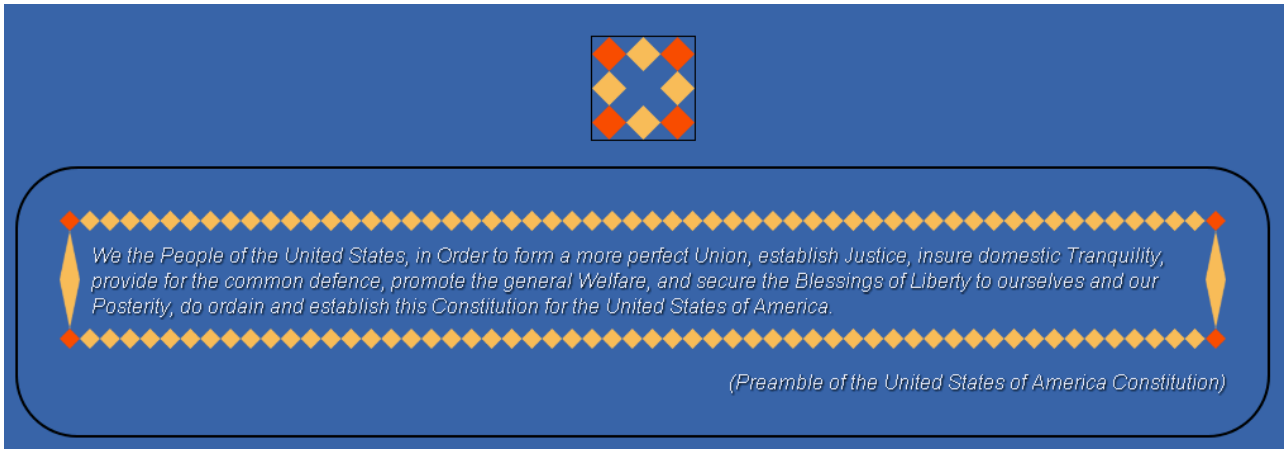
… apart from the properties that already in level 2

CSS 3 Selectors

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

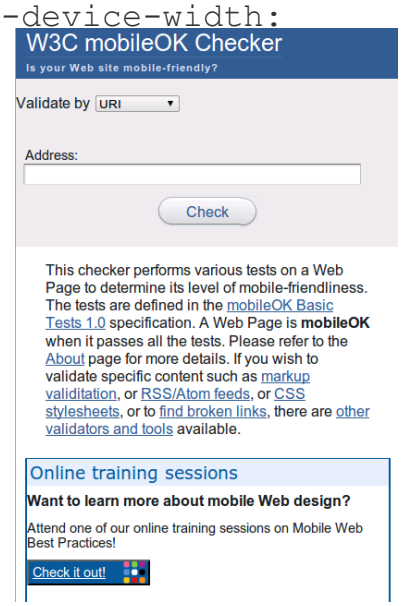
Date	Description	Depositption	Transfer	Withdrawal	Balance
10/08/2004	Restaurant	Expenses:Foods		38.14	440.67
10/10/2004	Market	Expenses:Groceries		123.14	317.53
10/11/2004	Gas	Expenses:Car		40.00	277.53
10/12/2004	Payroll	Income:Salary	2,000.00		2277.53
10/12/2004	Home depot	Expenses:House Supplies		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



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)" />
```



CSS Examples

Simple illustrations

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

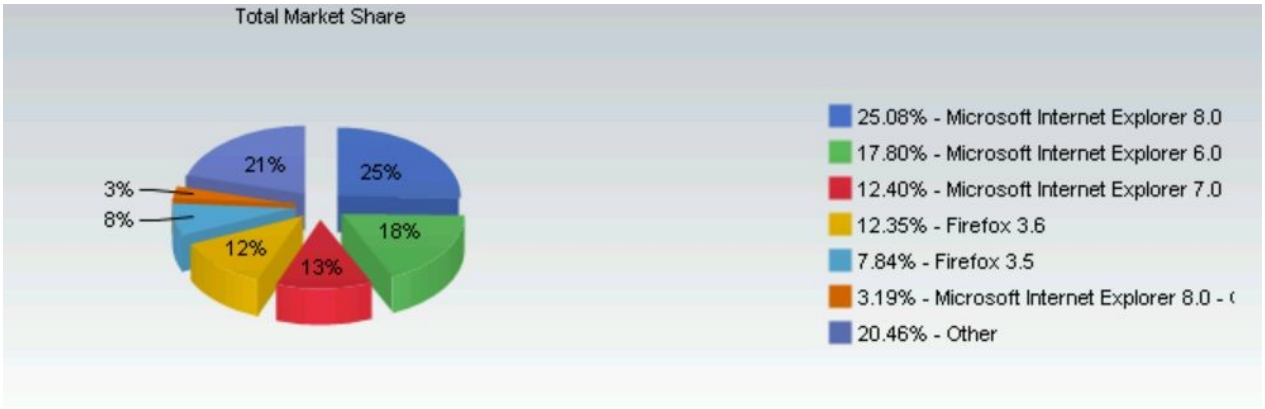
HTML5

HTML 5: Quick history

- 2004:
  - Opera, Mozilla, and Apple creates the WHAT WG (*Web Hypertext Application Technology Working Group*)
- 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
- 2014
  - Q2: Plan for publication as W3C Recommendation

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

The HTML5 specification

New elements - structure

- **section:** generic document or application section.
- **article:** independent piece of content of a document.
- **aside:** content that is only slightly related to the rest of the page.
- **hgroup:** header of a section.
- **header:** group of introductory or navigational aids.
- **footer:** footer for a section.
- **nav:** section of the document intended for navigation.
- **figure** self-contained flow content.
- **figcaption:** caption´..

New elements – other 1/2

- **video** and **audio**
- **track**: text tracks for the video element.
- **embed**: plugin content.
- **mark**: marked or highlighted text.
- **progress**: completion of a task (downloading, ...).
- **meter**: measurement (disk usage, ...).
- **time**: date and/or time.
- **ruby**, **rt**, **rp**: ruby annotations.
- **bdi**: bidirectional text formatting.

New elements – other 2/2

- **wbr**: line break opportunity.
- **canvas**: dynamic bitmap graphics.
- **command**: command the user can invoke.
- **details**: additional information to user.
- **datalist**: data for comboboxes.
- **keygen**: key pair generation.
- **output**: output data (from scripts, ...).

New attributes … examples 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 … examples 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

Other types of changes to markup

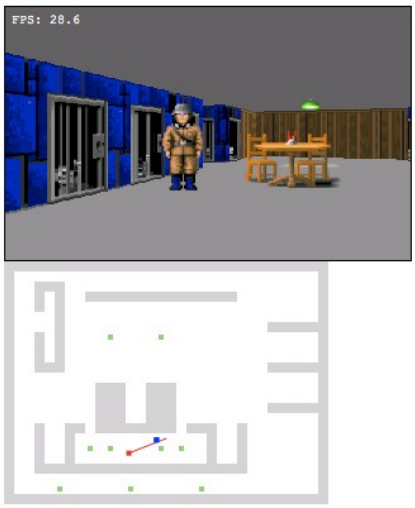
- Changed elements: **a**, **address**, **dl**, ...
- Changed attributes: <script **type**=..>, <table **border**=...>, …
- Removed elements: **basefont**, **big**, **center**, …
- Removed attributes: <link **target**=...>, <img **longdesc**=...>, ...

Changes to internal structure

- New APIs: audio, video, drag-and-drop, edit,
- DOM extensions: HTMLDocument,HTMLElement

Canvas

- 2D drawing space
- Scripted manipulation
- Dynamic contents



Demo examples: html5

HTML 5.0 <video>

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

Demo 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:	**Audio codec**:	**Captioning, Video description:**	**Metadata**:
H.264, VP8, Theora, Dirac 2.1, H.263, etc.	AAC, WMA, Vorbis, PCM, etc.	SAMI, SMIL, Hi-Caption, CMML, DFXP, 3GPP TS 26.245, MPSub, etc.	MPEG-7, CableLabs, TV-ANytime, EBU, XMP, etc.

Codec implementations

HTML Working Group

- 54 W3C Member organizations
- 419 participants in the group
- 225 Invited Experts
- Coordinates with WHATWG .

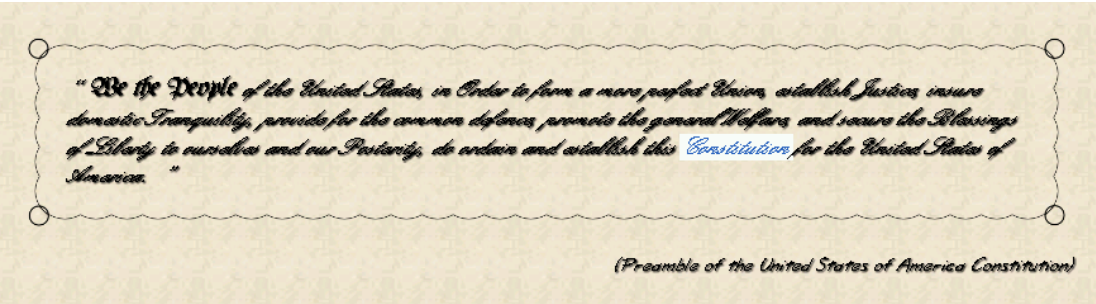
Tests suites

- Needed for approving as web standard.
- Extensive contributions from Microsoft, Opera and others.
- Have implementation results for 925 tests and currently 1276 approved test cases.
- 28,858 test have been submitted including ~8,000 are parser tests and another ~18,000 are for testing attribute reflection
- Test results (snapshot):
  - http://w3c-test.org/html/tests/reporting/report.htm

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, ...

HTML5 and apps

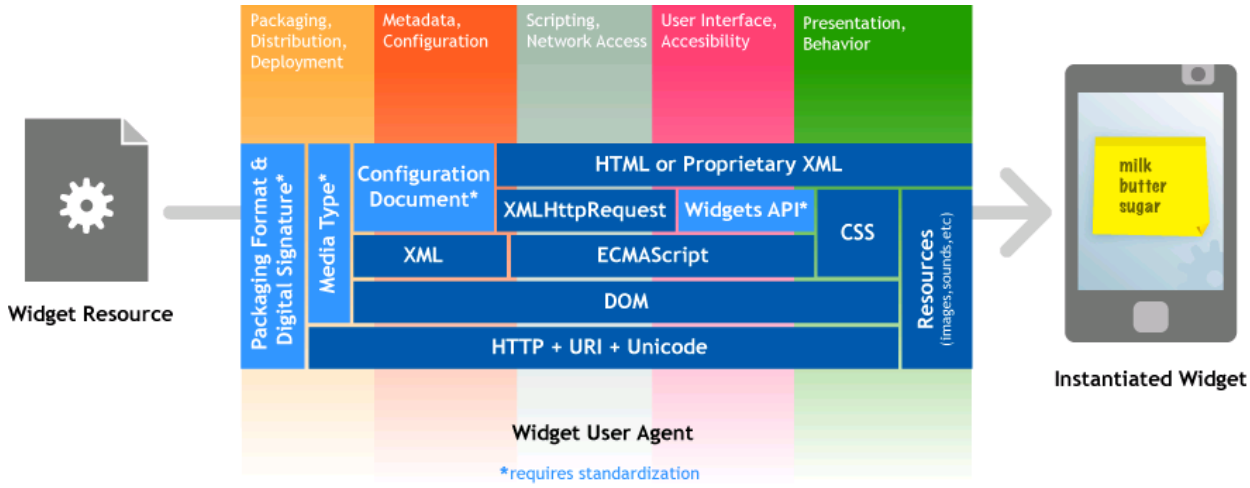
Apps – a practical objective

- Growth of mobile space
- A main driver for W3C work: support for "*web* apps"
- Supporting technologies:
  - HTML5
  - Functional components … defined APIs

Web Apps @ W3C

- Web Applications (WebApps) Working Group
  - enable improved client-side application development on the Web, including specifications for
    - application programming interfaces (APIs) for client-side development
    - markup vocabularies for describing and controlling client-side application behavior.
- Widget
  - packaging and delivery
  - single download/installation
  - run as standalone (i.e., outside browser)
  - expressed in web technologies
  - executed in a small “virtual machine”

Widget technology stack – generic view



Web Apps: Technology APIs

- Web DOM4/Core API
- Drag Drop API
- Text Selection API
- Undo History API
- 2D Context API
- Web Storage API
- Web Sockets API
- Web Workers API
- Web Messaging API
- Geolocation API
- Indexed Database API
- Microdata API
- RDFa API
- Element Traversal API
- XMLHttpRequest API
- Web Notification API
- DOM Level 3 Events API
- Navigation Timing API
- Multi-touch Events API
- CSSOM View Module API
- Selectors API
- File API
- Web Events API
- Resource Timing API
- Audio API
- Messaging API
- Device API
- ...

Web Apps: Other candidate areas/needs

- Video Streaming (adaptive and live), P2P
- TV remote, DLNA
- TV channels, Speech
- More Web performance benchmarks
- 3D at the markup level (SVG equivalent)
- Identity, Access control
- Security, Privacy
- Digital content distribution and micropayment
- Data and query server discovery, service description
- Federated query server
- Trust, Provenance
- Read-write Web
- Interoperability
- Education materials
- Certification (software and developers)
- Authoring tools support
- Multilingual support
- Publishing pipeline: more on XML?
- ...

Web Apps vs Native Apps

Differences in terms of:

- Portability
- Provisioning
- Developer skills
- Interoperability
- Integrated web management
- etc.

- Use vendor-specific functionality
- Be seen in a specific AppStore
- etc.

Will web apps happen?

“One Billion HTML5 Phones to be Sold Worldwide in 2013”

Boston, MA - December 7, 2011

According to the latest research from Strategy Analytics, *worldwide HTML5 phone sales will surge from 336 million units in 2011 to 1 billion units in 2013*.

HTML5 has quickly become a high-growth technology that will help smartphones, feature phones, tablets, notebooks, desktop PCs, televisions and vehicles to converge through cloud services.

http://www.strategyanalytics.com/default.aspx?mod=pressreleaseviewer&a0=5145

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!