



HTML5 and CSS3 – The Future of the Web Programming



AL-FARABI KAZAKH NATIONAL UNIVERSITY



Current Web Development

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Department
of Software
and Computing
Systems



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Why standards are important?

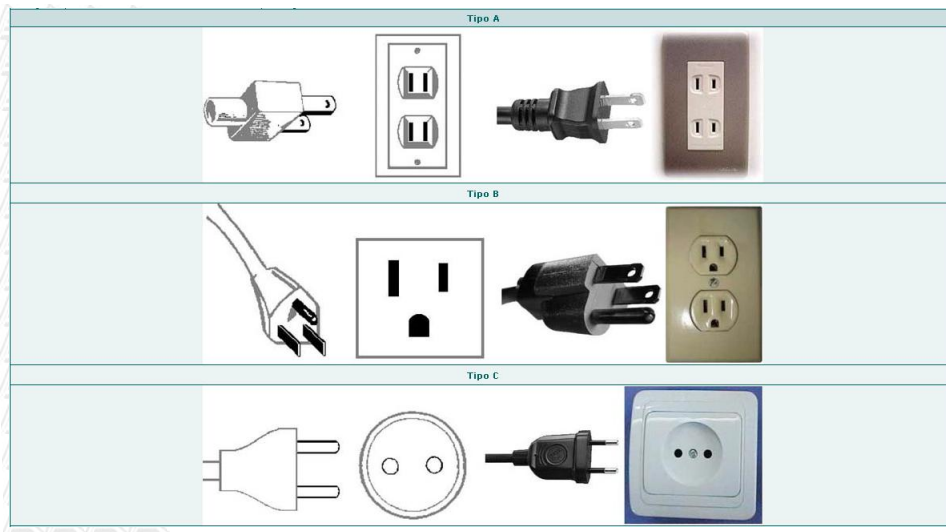
- **QUESTION**
- How many types of plugs & sockets are there (we don't consider voltages and frequencies)?





Why standards are important?

**There are no less than 13 types of
plugs & sockets!!**

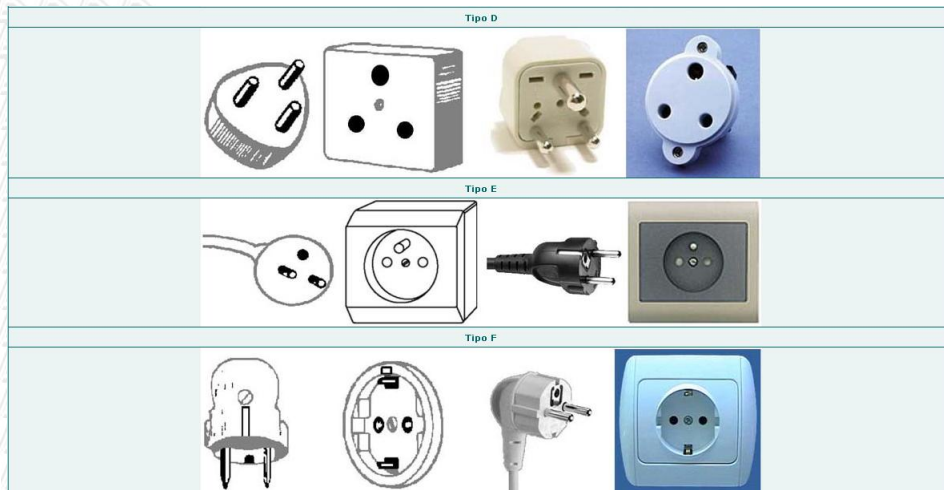




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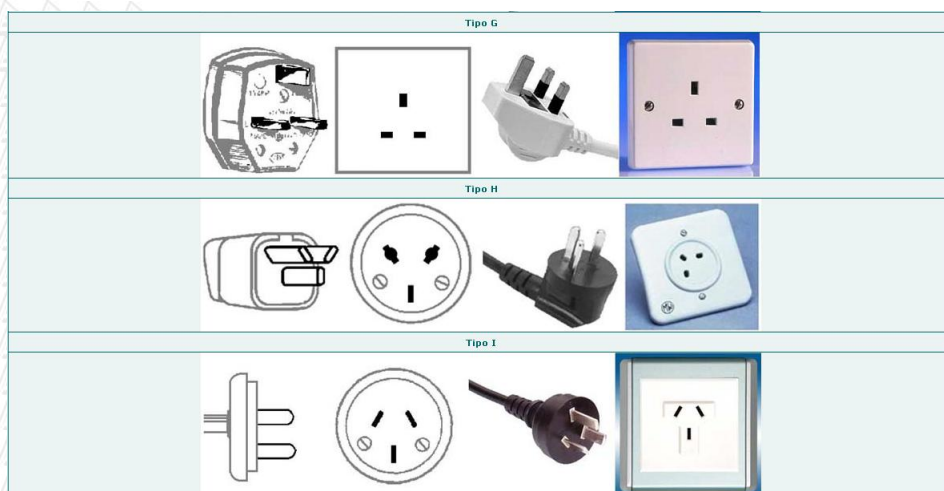
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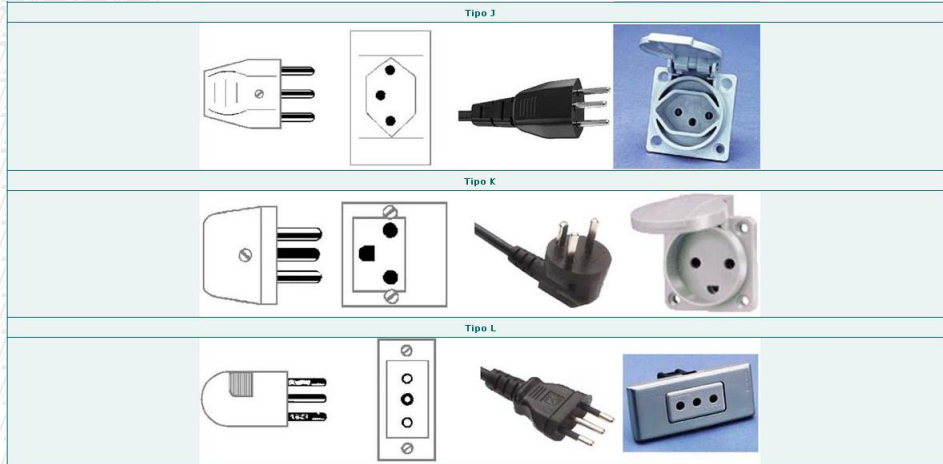




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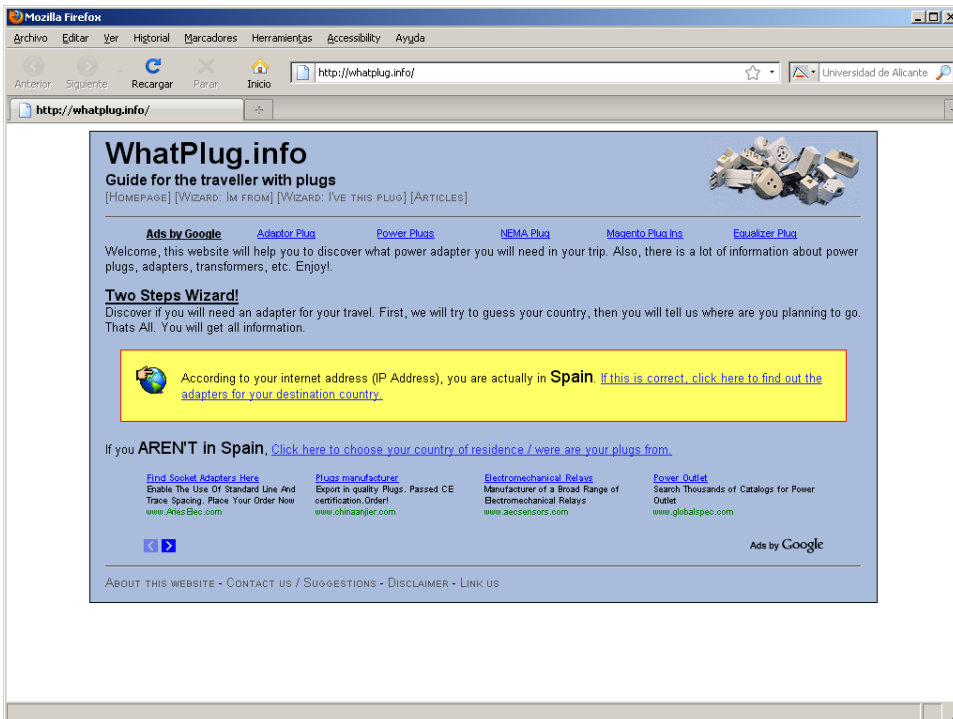
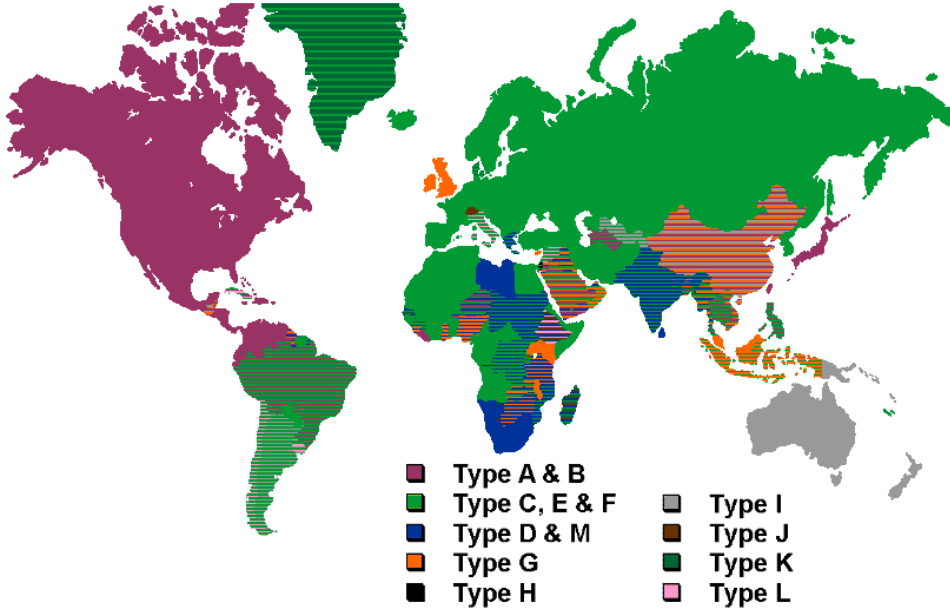


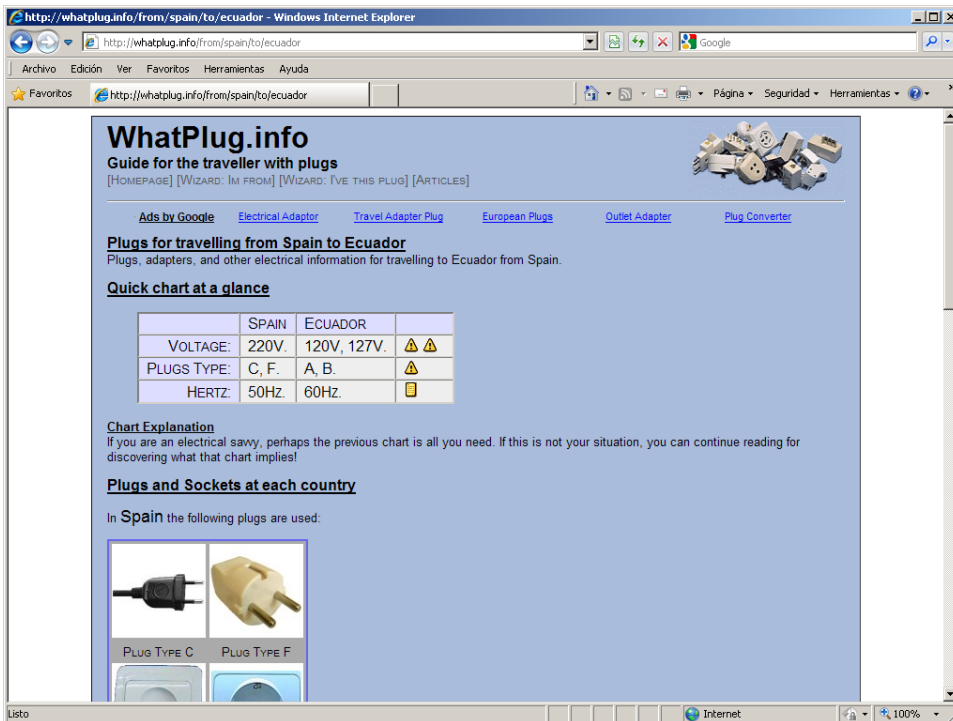
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Why standards are important?

- **QUESTION**
- Are there and are used standards in computing?





Why standards are important?

- IBM PC (Wikipedia):

Rather than going through the usual IBM design process, a special team was assembled with authorization to bypass normal company restrictions and get something to market rapidly.

[...]

*To achieve this they first decided to build the machine with **"off-the-shelf" parts** from a **variety of different original equipment manufacturers (OEMs)** and countries.*



Why standards are important?

[...]

Secondly for scheduling and cost reasons, rather than developing unique IBM PC monitor and printer designs, project management decided to utilize an existing "off-the-shelf" IBM monitor developed earlier in IBM Japan as well as an existing Epson printer model. Consequently, the unique IBM PC industrial design elements were relegated to the system unit and keyboard.



Why standards are important?

[...]

They also decided on an **open architecture**, so that **other manufacturers** could produce and sell peripheral components and compatible software without purchasing licenses. IBM also sold an **IBM PC Technical Reference Manual** which included **complete circuit schematics**, a listing of the **ROM BIOS source code**, and other engineering and programming information.



Why standards are important?

- Standardization (Wikipedia):

Standardization or **standardisation** is the process of developing and agreeing upon technical standards. A standard is a document that establishes uniform engineering or technical specifications, criteria, methods, processes, or practices.





Why standards are important?

- Standardization (Wikipedia):

The goals of standardization can be to help with independence of single suppliers (commoditization), compatibility, interoperability, safety, repeatability, or quality.



Why standards are important?

- Standards can be classified according to different aspects:
 - Closed standard, RAND, open or free
 - Legal standard (*de iure*) or fact standard (*de facto*)
 - National, international or industrial standard





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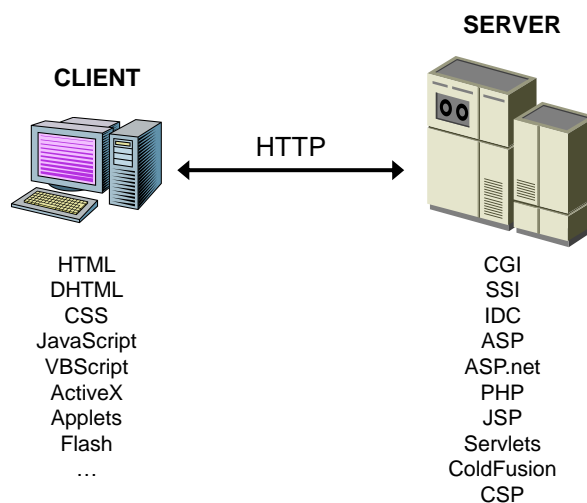
Are there any standards in web development?

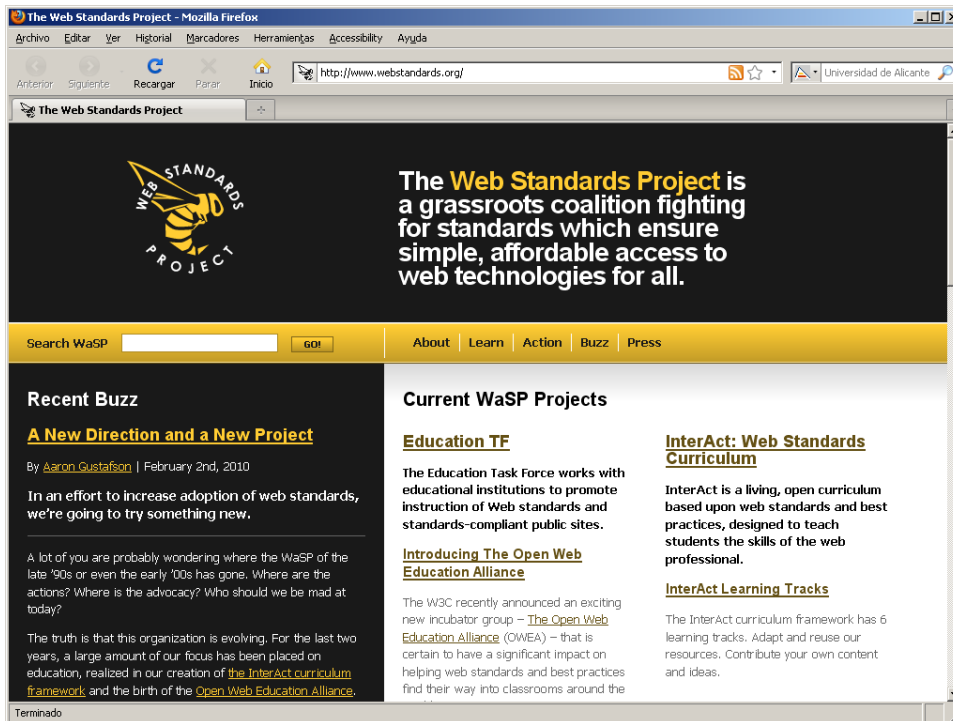


- **QUESTION**
- Are there any standards in web development?



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The Web Standards Project

- WaSP: Fighting for standards
 - <http://www.webstandards.org/about/mission/>



The Web Standards Project

*Founded in 1998, The Web Standards Project (WaSP) fights for standards that **reduce the cost and complexity** of development while increasing the **accessibility and long-term viability** of any site published on the Web. We work with browser companies, authoring tool makers, and our peers to deliver the true power of standards to this medium.*



The Web Standards Project

- What happens when standards are not used?
- In the past:
 - *By releasing browsers that failed to uniformly support standards, manufacturers needlessly fragmented the Web, injuring **designers, developers, users, and businesses** alike.*





The Web Standards Project

- Designers, programmers, and owners of web sites:
 - *could they afford to implement multiple versions of every web page in order to accommodate incompatible browsers?*
 - *If not, which browsers should they neglect, and how many millions of potential visitors were they willing to turn away?*
 - *The fractured browser market added at least 25% to the cost of developing all sites.*



The Web Standards Project

- Users:
 - *When using the “wrong” browser, many could not view content or perform desired transactions.*
 - *Among those most frequently hurt were people with disabilities or special needs.*



The Web Standards Project

- Nowadays:
 - *Beginning in 2000, one leading browser after another delivered on the promise of many of the standards we had (sometimes shrilly) promoted.*
 - *Current market-leading browsers, along with several of their competitors, provide excellent support for HTML 4, Compatible XHTML 1.0, CSS Level 1, ECMAScript (the standard version of JavaScript), and the DOM—or are on the road to such compliance.*



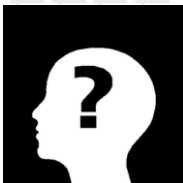
The Web Standards Project

- Then, what is the problem nowadays?
 - *Today's browsers support standards, although there are some exceptions (Internet Explorer).*
 - *Authors' tools that create invalid, non-semantic sites instead of standards are still used.*
 - *Tens of thousands of professional designers and developers continue to use outdated methods that yoke structure to presentation, in some cases entirely avoiding semantic structures and misusing (X)HTML as a design tool.*



The Web Standards Project

- *Many books on web development still teach outdated methods, and many practitioners take pride in delivering sites that look and work exactly the same in compliant and non-compliant desktop browsers alike, at the cost of accessibility, long-term viability, forward compatibility, and lack of alternative device support.*
- *Others develop proprietary code that works only in a handful of popular browsers.*



The Web Standards Project

- **QUESTION**
- What are the standards in web development nowadays?





The Web Standards Project

- **Structural and Semantic Languages**
 - Hypertext Markup Language (HTML) 4.01
 - Extensible Hypertext Markup Language (XHTML) 1.0
 - Extensible Markup Language (XML) 1.0
- **Presentation Languages**
 - Cascading Style Sheets (CSS) level 1
 - CSS level 2 revision 1
 - CSS level 3



The Web Standards Project

- **Object Models**
 - Document Object Model (DOM) level 1
 - DOM Level 2 (HTML, Core, Events, Traversal)
 - DOM Level 3 (Core)
- **Scripting Languages**
 - ECMAScript 262 (the standard version of JavaScript)



The Web Standards Project

- Advanced browsers which have fully implemented the above should consider implementing the following:
- Extensions and updates to HTML4 and XHTML 1.0
 - Microformats
 - Web Applications 1.0 (AKA "HTML5")
 - XHTML 1.1
- Additional Markup Languages
 - Mathematical Markup Language (MathML) 1.01
 - MathML 2.0
 - Scalable Vector Graphics (SVG)



Sources of information

- Internet is full of millions of web sites with examples, tutorials, reference guides, etc.
- You must be careful to avoid:
 - Bad habits
 - Old techniques
 - Use of browser specific features
 - Incorrect use of current techniques
- Then:
 - Use reliable sources
 - Use up to date sources



Sources of information

- Erroneous examples:
 - Incorrect tags
 - Huge image maps
 - Graphical effects with images that can be achieved with CSS
 - Table layout
 - Old scripts for detecting browser version

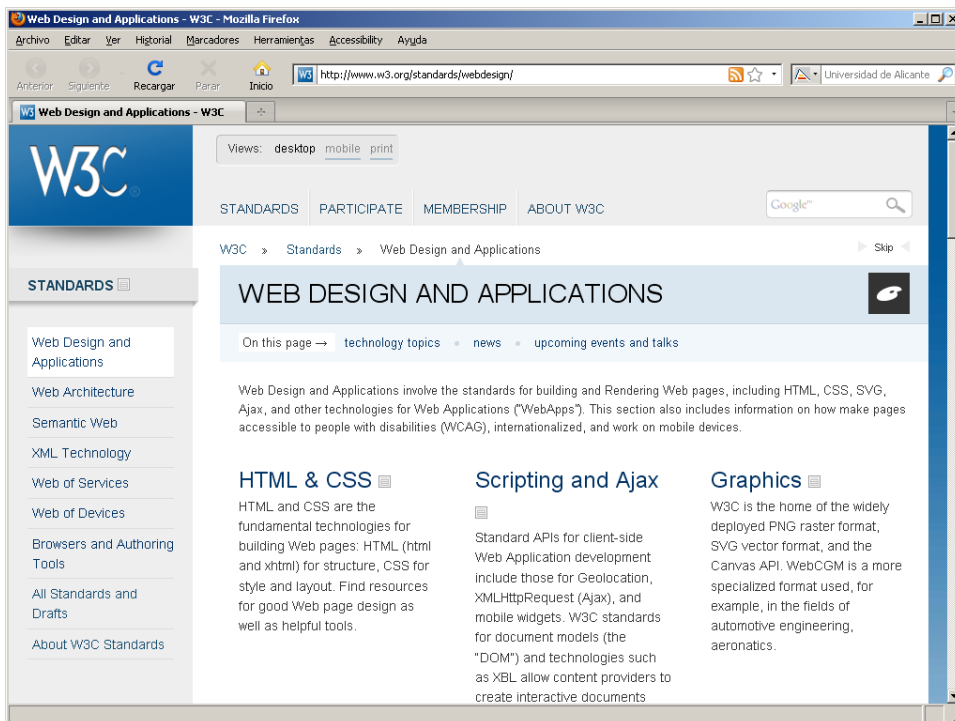
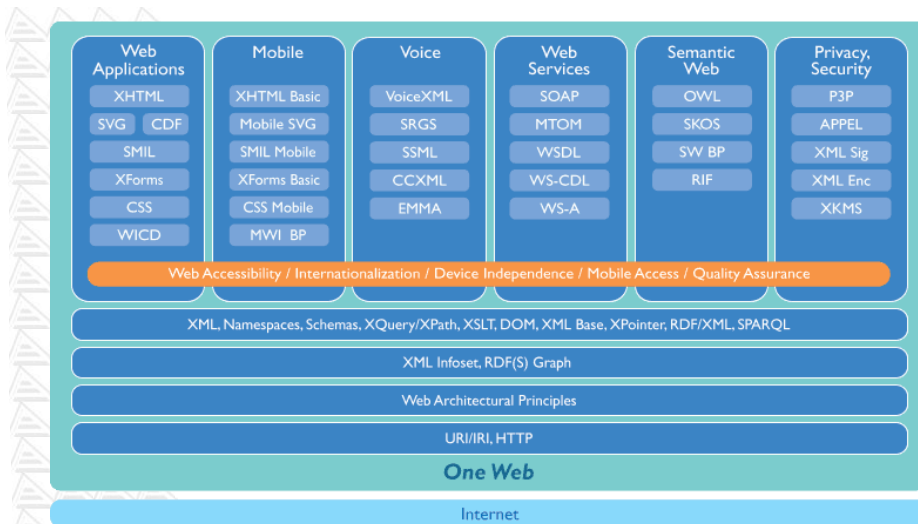


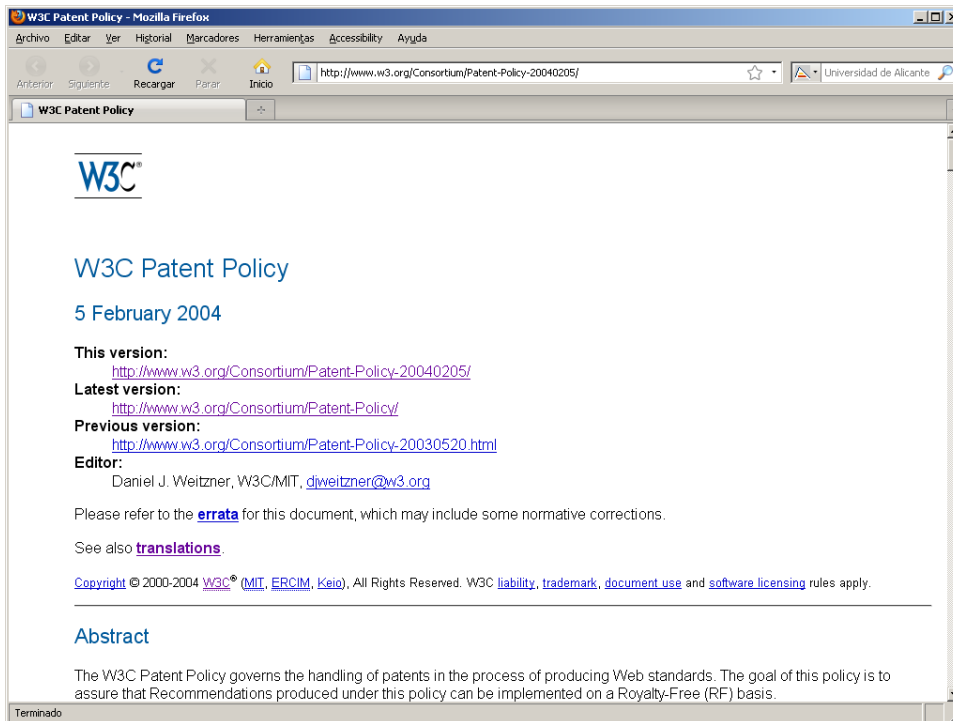
Sources of information

- **QUESTION**
- Who defines web standards?



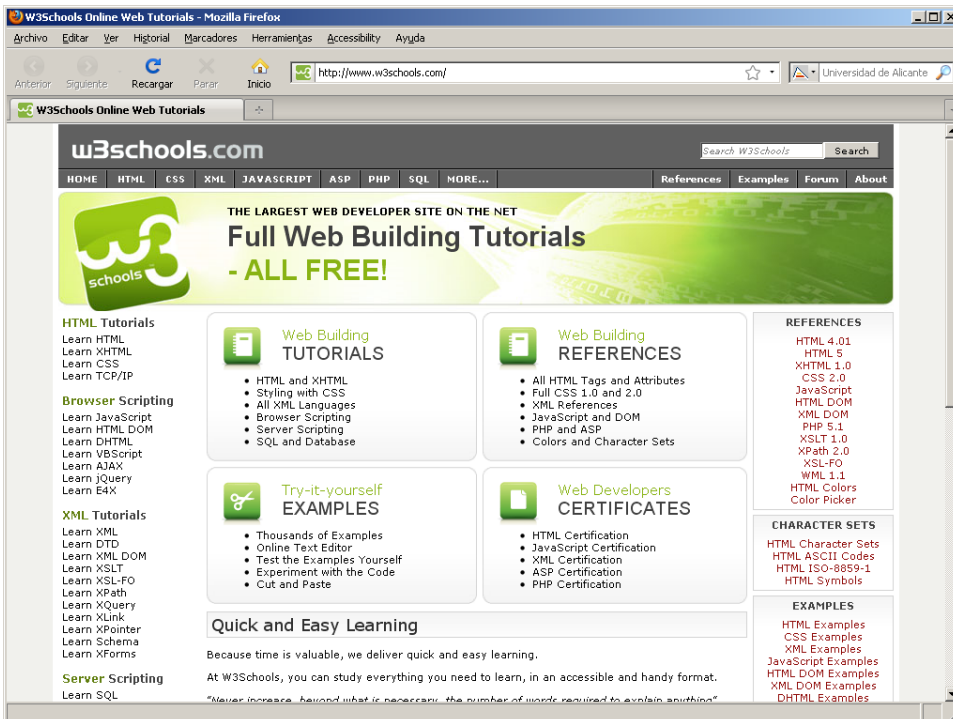
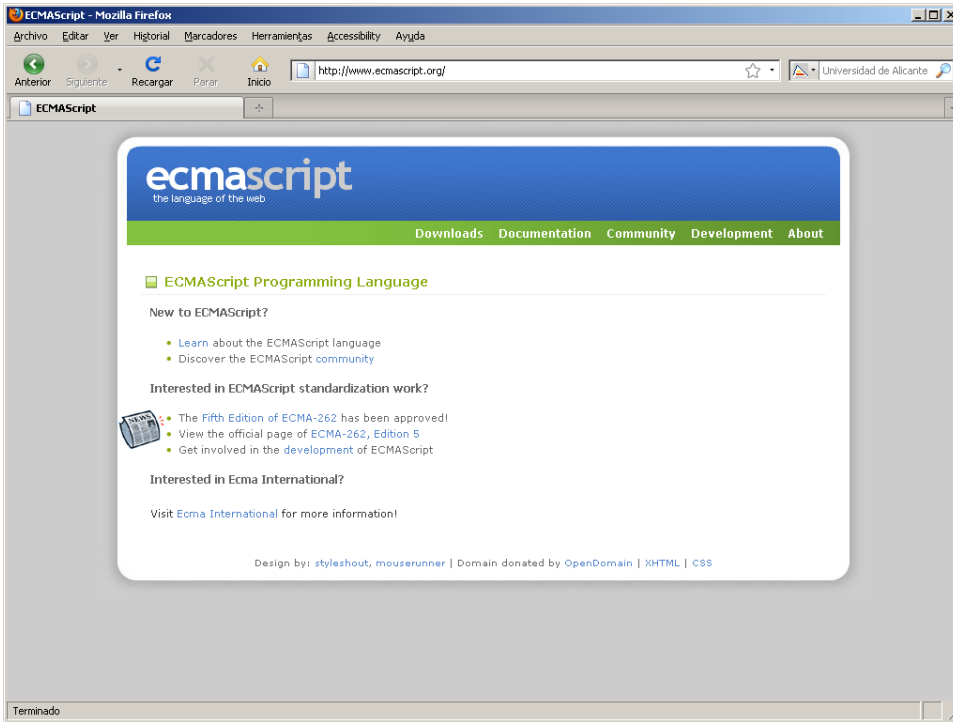






Sources of information

- W3C Patent Policy
 - <http://www.w3.org/Consortium/Patent-Policy/>
 - <http://www.w3c.es/Divulgacion/GuiasBreves/PoliticaPatentes>
- Objective: to protect the Web from standards based on patents
- Royalty-Free



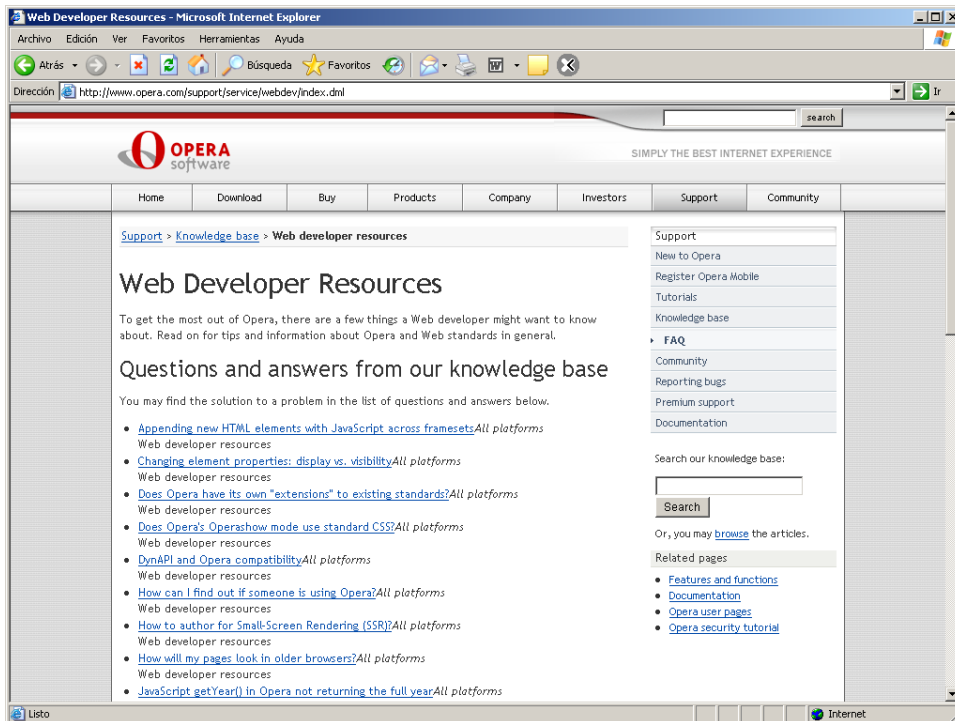


The screenshot shows a Microsoft Internet Explorer browser window displaying the MSDN Library page for "HTML and DHTML Reference". The browser's address bar shows the URL: http://msdn.microsoft.com/library/default.asp?url=/workshop/author/dhtml/reference/dhtml_reference_entry.asp. The page content includes a search bar, a navigation menu on the left, and a main content area with the following sections:

- HTML and DHTML Reference**: This section contains reference information for the Dynamic HTML (DHTML) API.
- Dynamic HTML (DHTML) Object Model References**:
 - [DHTML Collections](#): This section contains a list of the collections exposed by the DHTML Object Model.
 - [DHTML Constants](#): This section lists the constants in the DHTML Object Model.
 - [DHTML Events](#): This section contains the events exposed by the DHTML Object Model.
 - [DHTML Methods](#): This section contains a list of the methods exposed by the DHTML Object Model.
 - [DHTML Objects](#): This section contains a list of the objects defined by DHTML.
 - [DHTML Properties](#): This section contains a list of the properties in the DHTML Object Model.
- HTML References**:
 - [HTML Character Sets](#): Character sets determine how the bytes that represent the text of your HTML document are translated to readable characters. Microsoft Internet Explorer interprets the bytes in your document according to the applied

The screenshot shows the Mozilla.org website's "Web developer documentation" page. The browser's address bar shows the URL: <http://www.mozilla.org/docs/web-developer/>. The page features a search bar, navigation buttons (Products, Support, Store, Developers, About), and a sidebar with links to various sections like Roadmap, Projects, Coding, and Testing. The main content area includes:

- Web developer documentation**:
 - [Mozilla developer web developer and user](#)
- This page provides links to documentation for web developers (people who write web pages) who are interested in the languages used to write web pages for Mozilla and other browsers that support the same standards.
- Numbered list:
 - [Writing for Mozilla](#)
 - [Document Formats](#)
 - [Style](#)
 - [Scripting](#)
- Writing for Mozilla**:
 - [Mozilla Web Author FAQ](#)
 - [Netscape DevEdge](#) - articles, technotes, and cross-browser scripting tools from Netscape's evangelism group, including [sidebar tabs](#) that can be installed in Mozilla
 - [Using Web Standards in Your Web Pages](#) - tools, tips, recommendations and resources for upgrading Web pages for Firefox, Seamonkey, Mozilla browsers and any/all web standards compliant browsers
 - [Mozilla's quirks mode](#)



HTML5 & CSS3

Sources of information



- Opera Web Standards Curriculum
 - <http://www.opera.com/company/education/curriculum/>
- Offers a full course on the technologies used in the client programming: HTML + CSS + JavaScript



Opera: Web Standards Curriculum - Windows Internet Explorer

http://www.opera.com/company/education/curriculum/

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OPERA software

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Education

- Overview
- University tours
- In your curriculum**
- In your lab
- Campus crew
- Forums
- Job opportunities

Be heard

Professors and teachers can discuss the Opera WSC and share learning resources on our [discussion forum](#).

Show your support

If you want to show your support for the Opera Web Standards Curriculum, link to it using [one of these buttons](#).

Making the WSC work for you

Opera Web Standards Curriculum

As the most standards-compliant Web browser, Opera is dedicated to promoting Web standards across the globe. Web standards make the Web available to anyone, on any device, anywhere in the world.

Opera has created the [Web Standards Curriculum](#) (WSC) in association with the Yahoo! Developer Network. This tutorial course takes students from complete beginner to having a solid grounding in standards-based Web design, including HTML, CSS, and JavaScript development. The course is supported by top companies and organizations such as the Web Standards Project (WaSP) and Yahoo!.

Split into more than 50 focused articles, students can follow the curriculum from start to finish or simply read

Opera: Web Standards Curriculum - Windows Internet Explorer

http://www.opera.com/company/education/curriculum/

Opera: Web Standards Curriculum

Table of contents

The beginning

1. Introductory material, by Chris Mills—This is the one you're reading.

TRANSLATIONS AVAILABLE! There are [translations of the web standards curriculum available here](#).

Introduction to the world of web standards

2. [The history of the Internet and the web, and the evolution of web standards](#), by Mark Norman Francis.
3. [How does the Internet work?](#), by Jonathan Lane.
4. [The Web standards model—HTML, CSS and JavaScript](#), by Jonathan Lane.
5. [Beautiful dream, but what's the reality?](#), by Jonathan Lane.

Web Design Concepts

This section won't go into any code or markup details, and will act as an introduction to the design process before you start to create any graphics or code, as well as concepts of web design such as IA, navigation, usability etc.

6. [Information Architecture—planning out a web site](#), by Jonathan Lane.
7. [What does a good web page need?](#), by Mark Norman Francis.
8. [Colour Theory](#), by Linda Goin.
9. [Building up a site wireframe](#), by Linda Goin.
10. [Colour schemes and design mockups](#), by Linda Goin.
11. [Typography on the web](#), by Paul Haine.

HTML basics

12. [The basics of HTML](#), by Mark Norman Francis.
13. [The HTML <head> element](#), by Christian Heilmann.
14. [Choosing the right doctype for your HTML documents](#), by Roger Johansson.

The HTML body

15. [Marking up textual content in HTML](#), by Mark Norman Francis.
16. [HTML Lists](#), by Ben Buchanan.
17. [Images in HTML](#), by Christian Heilmann.

For students

If your course already teaches Web Standards and best practices, then great - why not supplement your course texts with our material? If not, then lobby your teachers to adopt our material, thereby helping to improve the relevance of their lessons to real-world web development.

For Web developers

Web Standards have never been easier to learn. Everything you need to know is condensed into short, helpful tutorials that inform and inspire. Opera's Web Standards Curriculum can help you brush up on things you know and maybe even teach you something you didn't.

For businesses

[Web Standards Curriculum](#) is ideal for in-house training. Empower your development team to use Web Standards that reduce bandwidth, spur innovation and promote good coding practices across the Web.

For the Web

The beauty of the Web is that it creates a uniform, international development platform. Using Web Standards means your sites will be quicker to code and maintain, more compact, and accessible to web users regardless of their browsing platform and (dis)ability.

"It has been now released and it's a wonderful piece of work. I will give it a full"



Opera: Web Standards Curriculum - Windows Internet Explorer

http://www.opera.com/company/education/curriculum/

Archivo Edición Ver Favoritos Herramientas Ayuda

Favoritos Opera: Web Standards Curriculum

18. [HTML links—let's build a web!](#) by Christian Heilmann.

19. [HTML Tables](#), by Jen Hanen.

20. [HTML Forms—the basics](#), by Jen Hanen.

21. [Lesser-known semantic elements](#), by Mark Norman Francis.

22. [Generic containers—the div and span elements](#), by Mark Norman Francis.

23. [Creating multiple pages with navigation menus](#), by Christian Heilmann.

24. [Validating your HTML](#), by Mark Norman Francis.

Accessibility

25. [Accessibility basics](#), by Tom Hughes-Croucher.

26. [Accessibility testing](#), by Benjamin Hawkes-Lewis.

CSS

27. [CSS basics](#), by Christian Heilmann.

28. [Inheritance and Cascade](#), by Tommy Olsson.

29. [Text styling with CSS](#), by Ben Henick.

30. [The CSS layout model - boxes, borders, margins, padding](#), by Ben Henick.

31. [CSS background images](#), by Nicole Sullivan.

32. [Styling lists and links](#), by Ben Buchanan.

33. [Styling tables](#), by Ben Buchanan.

34. [Styling forms](#), by Ben Henick.

35. [Floats and clearing](#), by Tommy Olsson.

36. [CSS static and relative positioning](#), by Tommy Olsson.

37. [CSS absolute and fixed positioning](#), by Tommy Olsson.

Advanced CSS study

38. [Headers, footers, columns, and templates](#), by Ben Henick

JavaScript core skills

39. [Programming - the real basics!](#) by Christian Heilmann

40. [What can you do with JavaScript?](#) by Christian Heilmann

41. [Your first look at JavaScript](#), by Christian Heilmann

42. [JavaScript best practices](#), by Christian Heilmann

43. [The principles of unobtrusive JavaScript](#), by PPK

44. [JavaScript functions](#), by Mike West

wonderful piece of work. I will give you a read and review in the next month and suggest things to Chris Mills. Now how can you help? Read it, use it in your Web agency, in your classroom, among your Web developers friends. Note what people misunderstood, suggest techniques to Chris Mills to improve his materials. Publish it on your blog, talk about it. Let it grow in the community. It's a cool work which comes from a long story and really it is beautiful story. Thanks to Chris Mills and Opera. They did it."

Karl Dubost, W3C

"Just wanted to send you a quick note to say thank you for your web standards course. I am a completely self-taught graphic designer, and I specialize in print. I have been trying (un-successfully) to teach myself web design for some time now, and your course has helped me more in the last 5 days than all of the other materials I have been trying for the last few years combined."

Candie Sampson, Art Director, NarrowCasting

"Web development and design are ever evolving professions. Anyone teaching these subjects must ask themselves if they are equipping their students with best practices or burdening them with impractical methodologies. All of us in

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http://www.opera.com/company/education/curriculum/

Archivo Edición Ver Favoritos Herramientas Ayuda

Favoritos Opera: Web Standards Curriculum

45. [Objects in JavaScript](#), by Mike West

46. [Traversing the DOM](#), by Mike West

47. [Creating and modifying HTML](#), by Stuart Langridge

48. [Dynamic style - manipulating CSS with JavaScript](#), by Greg Schechter

49. [Handling events with JavaScript](#), by Robert Nyman

50. [JavaScript animation](#), by Stuart Langridge

51. [Graceful degradation versus progressive enhancement](#), by Christian Heilmann

Mobile web development

1. [Mobile 1: Introduction to the mobile web](#), by Brian Suda

Supplementary articles

Microformats

- [Introduction to hCard](#), by Christopher Schmitt
- [Introduction to hCard, Part two: Styling hCards](#), by Christopher Schmitt
- [XFN encoding, extraction and visualizations](#), by Brian Suda
- [Styling XFN and rel-license links](#), by Christopher Schmitt
- [Styling hReview Microformats](#), by Christopher Schmitt
- [Microformat Encoding and Visualization](#), by Brian Suda

Supplementary accessibility articles

- [Introduction to WAI-ARIA](#), by Gez Lemon
- [Creating accessible data tables](#), by Frank Palinkas
- [Building Accessible Static Navigation with CSS](#), by Frank Palinkas

Miscellaneous

- [Getting your content online](#), by Craig Grannell
- [More about the document <head>](#), by Chris Heilmann.
- [Supplementary: Common HTML entities used for typography](#), by Ben Henick.
- [The Opera Web Standards Curriculum glossary](#), by various authors. This is incomplete, and will be added to as time goes by.

impractical methodologies. All of us in this field can benefit from this resource and use it as a catalyst to further the W3C vision of Web for Everyone. Web on Everything."

Glenda Sims, Senior Systems Analyst, University of Texas, United States

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Erroneous examples

- Access to a web form:

```
<form name="myForm" id="formId"
      action="action.php" method="post">
  <!-- Controls of the form -->
  Name: <input type="text" name="name"
           id="nameId"/>
  <input type="submit" value="Send" />
</form>
```



Erroneous examples

- Non-standard (but it works):

```
var formElement = document["myForm"];
var formElement = document.myForm;
```



Erroneous examples

- Standard in HTML 4.01 (but it's not allowed in XHTML 1.0 Strict, because `<form>` element doesn't have the name attribute):

```
var formElement = document.forms["myForm"];  
var formElement = document.forms.myForm;
```



Erroneous examples

- Standard, but not very useful:

```
var formElement = document.forms[0];
```

- Standard, fast and simple:

```
var formElement =  
    document.getElementById("formId");
```



Erroneous examples

- Creation of new content:
 - How is the content of a text paragraph changed?



Erroneous examples

```
<body>
<p id="p1">
This is paragraph 1.
</p>
<p id="p2">
This is paragraph 2.
</p>
<p id="p3">
This is paragraph 3.
</p>
</body>
```





Erroneous examples

```
// Incorrect: this is DOM 0, it's not standard
p.innerHTML = txt;
// Correct, it's standard, but it doesn't work in Internet
Explorer
p.textContent = txt;
// Incorrect, it's not standard, it works only in Internet
Explorer
p.text = txt;
// Incorrect, it's not standard, it works only in Internet
Explorer
p.innerText = txt;
// It only works with the following types of nodes:
CDATASection, Comment, ProcessingInstruction, Text
// It doesn't work with a paragraph (Element)
p.nodeValue = txt;
```



Erroneous examples

```
var p = document.createElement("p");

// Correct, it works in all browsers
p.appendChild(document.createTextNode(txt));

// Correct, it works in all browsers
var tn = document.createTextNode("");
tn.nodeValue = txt;
p.appendChild(tn);
```