Advanced Web Programming with JavaScript and Google Maps

Voronezh State University
Voronezh (Russia)

Current Web Development

Sergio Luján Mora

Departamento de Lenguajes y Sistemas Informáticos
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- Why standards are important?
- Are there any standards in web development?
- The Web Standards Project
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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!!

<table>
<thead>
<tr>
<th>Type A</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Type A" /></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Type B</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Type B" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Type C</th>
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<tbody>
<tr>
<td><img src="image3" alt="Type C" /></td>
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</tbody>
</table>
### Advanced Web Programming

#### Universitat d'Alacant
Universidad de Alicante

<table>
<thead>
<tr>
<th>Type</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
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<td><img src="type-i.png" alt="Image" /></td>
</tr>
<tr>
<td>II</td>
<td><img src="type-ii.png" alt="Image" /></td>
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<td>III</td>
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<td>IV</td>
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</tbody>
</table>

### Advanced Web Programming

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<table>
<thead>
<tr>
<th>Type</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td><img src="type-v.png" alt="Image" /></td>
</tr>
</tbody>
</table>
WhatPlug.info
Guide for the traveller with plugs

Adding countries: America, Europe, Asia, Africa, Australia, Middle East, South America

Quick chart at a glance

Quick chart at a glance

Country: Ecuador
Voltage: 220V, 120V, 175V
Plug Type: C, E, A, B
Frequency: 50Hz, 60Hz

Chart Explanation
If you are an electrical fan, perhaps the previous chart is all you need. If this is not your situation, you can continue reading for discovering what that chart implied.
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.

[...]

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
Are there any standards in web development?

- QUESTION

Are there any standards in web development?
The Web Standards Project

- WaSP: Fighting for standards
  - [http://www.webstandards.org/about/mission/](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.*

- 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.*

• 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.

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

- **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

QUESTION

- Who defines web standards?
W3C Patent Policy

5 February 2004

This version: http://www.w3.org/Consortium/Patent-Policy-20040205/
Latest version: http://www.w3.org/Consortium/Patent-Policy/
Previous version: http://www.w3.org/Consortium/Patent-Policy-20030520.html
Editor: Danait J. Weitzner, W3C/MIT, <weitzner@w3.org>

Please refer to the errata for this document, which may include some normative corrections.
See also translations.

Abstract

The W3C Patent Policy governs the handling of patents in the process of producing Web standards. The goal of this policy is to ensure that recommendations produced under this policy can be implemented on a Royalty-Free (RF) basis.

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
Advanced Web Programming

HTML and DHTML Reference

Dynamic HTML (DHTML) Object Model References

Dynamic HTML (DHTML) Object Model

**HTML and DHTML Reference**

This section contains reference information for the Dynamic HTML (DHTML) object model.

- **DHTML Reference**
- **DHTML Objects**
- **HTML and DHTML Reference**
- **Properties**
- **Methods**
- **Collectors**
- **Events**
- **Canonical**
- **HTML and CSS**
- **Additional HTML Attributes**
- **Additional Document Attributes**
- **Document Attributes**
- **Security Considerations**

HTML and CSS

**HTML Reference**

- **HTML Character Sets**

Web developer documentation

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.

1. **Writing for Mozilla**
2. **Document Formats**
3. **Tools**
4. **Supporting Users**

**Writing for Mozilla**

- Mozilla Developer FAQ
- Netscape Developer - articles, technotes, and cross-browser compatibility tools from Netscape's developer group, including sidebars 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 web standards compliant browser
- Mozilla Developer Guide
Advanced Web Programming

Sources of information

- Opera Web Standards Curriculum

- Offers a full course on the technologies used in the client programming: HTML + CSS + JavaScript
About Opera

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 (W3C) and Yahoo!

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

Making the WSC work for you

Table of contents

The beginning

1. Introductory material, by Chris Mee—This is the one you’re reading.

2. Introduction to the world of web standards

3. The history of the Internet and the web, and the evolution of web standards, by Mark Norman Francis

4. How does the Internet work?, by Jonathan Lane

5. The Web standards model—HTML, CSS, and JavaScript, by Jonathan Lane

6. 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 Gao

9. Images in a web page, by Linda Gao

10. Colour schemes and design principles, by Linda Gao

11. Typography on the web, by Paul Heine

12. Benches

13. The basics of HTML, by Mark Norman Francis

14. The HTML cheat sheet, by Christina Heilman

15. Choosing the right directory for your HTML documents, by Roger Johansson

16. The HTML body

17. Images in HTML, by Christina Heilman

For web developers

For web designers

For businesses

For the Web

It has a proper name and it’s a government-run effort, you can call it a global standard. However, the reality is that the World Wide Web Consortium does not have a lot of money.
Advanced Web Programming

CSS
27. CSS basics, by Christian Heilmann
28. inheritance and cascade, by Tammy Olson
29. extending CSS, by Ben Harms
30. The CSS layout model, boxes, borders, margins, padding, by Ben Harms
31. Access to the DOM, by Mark Heimann
32. Styling using CSS, by Ben Harms
33. Styling tables, by Ben Harms
34. styling forms, by Ben Harms
35. Frames and framesets, by Tammy Olson
36. CSS, script and style processing, by Tammy Olson
37. CSS absolute and fixed position, by Tammy Olson

Advanced CSS study
38. Headers, footers, columns, and templates, by Ben Harms

JavaScript core skills
39. Programming, the real basics, by Christian Heilmann
40. What can you do with JavaScript?, by Christian Heilmann
41. You bet it all, by Christian Heilmann
42. JavaScript object prototypes, by Christian Heilmann
43. The principles of object-oriented JavaScript, by PPK
44. JavaScript features, by Mike West

Mobile web development
1. Mobile 1: Introduction to the mobile web, by Brian Suds

Supplementary articles

Microformats
• Introduction to microdata, by Christopher Schmitt
• Microdata and using structured data, by Christopher Schmitt
• HTML5 encoding, reduction, and invalidation, by Brian Suds
• Using HTML5 and all future HTML, by Christopher Schmitt
• Styling HTML5, by Christopher Schmitt
• Microdata Encoding and Visualisation, by Brian Suds

Supplementary accessibility articles
• Introduction to microdata, by Greg Simon
• Creating accessible data tables, by Frank Paquette
• Building Accessible Sites with HTML5, by Frank Paquette

Miscellaneous
• Getting your content online, by Greg Simon
• The Web is the design space, by Chris Heilmann
• Support for the W3C, by Ben Harms
• The W3C Web Standards Curriculum Glossary, by various authors

This is incomplete, and will be added as time goes by.
Erroneous examples

• Access to a web form:

```html
<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):

```javascript
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):

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

- Standard, but not very useful:

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

- Standard, fast and simple:

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

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

```html
<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);