An Overview of HTML5 and Deciding When to Use It

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Eduworks
Learning Objectives

At the end of this tutorial, you should be able to...

- Describe the problems that HTML5 solves for multimedia web content developers.
- Demonstrate an understanding of how HTML5 is being developed and adopted by industry.
- Describe the function and benefits of Canvas, SVG, WebGL, Local Storage and Cascading Style Sheets (CSS) 3.
- Compare and contrast the use of HTML5 and Flash for web development projects.
- List the platforms that support HTML5.
- List tools that support HTML5 development.
- Formulate a strategy for deciding when to use HTML5.
1. What is HTML5?
2. What Problems does HTML5 Address?
3. HTML5 as an Open Standard
4. DEMOS
5. Technical Overview of HTML5
6. Making the HTML5 Decision
7. HTML5 Tools and Resources
1. What is HTML5?

- **HTML** – Hypertext Markup Language (not programming language)
- **HTML5 is not official yet** ... But it is being used a lot in education, training and gaming

This says “make me bold.”

This says “make me strong.”

This is the logo. Look for it on products.
Why 5?

HTML has evolved to meet new requirements and to exploit the increased capabilities of user devices

- Multimedia without plug-ins (such as Flash)
- Standardized graphics and 3D animation
- Consumer technologies such as mobile devices
- Rich internet content such as games, simulations and eLearning

Evolution of HTML

- Static text and images
- Forms
- Frames and CSS
- User-generated content
- Rich media
HTML5 Rollout

HTML5

Taxonomy & Status (December 2011)

- W3C Recommendation
- Candidate Recommendation
- Last Call
- Working Draft
- Non-W3C Specifications
- Deprecated W3C APIs

By Sergey Mavrody 2011 | CC Attribution-ShareAlike 3.0
2. What Problems Does HTML5 Address?
Cross-Platform Compatibility

- Flash does not work on Apple devices
  - But even if it did, it is proprietary!
- Too many options for 3D, Audio, and Video
  - Those options are technology dependent
- The browser is becoming the operating system
  - Browsers should be responsible for how video is played and graphics are rendered

CAVEAT: NOT SUPPORTED BY IE7, LIMITED SUPPORT IN IE8

HTML5 is still a DRAFT
Better 3D Support and Scripting

➢ Full 3D support in an HTML environment
  ▪ 3D currently done with ActiveX objects or Flash
  ▪ HTML5 uses WebGL
    ▶ A derivative of OpenGL, which is widely accepted
    ▶ Like OpenGL “in the browser”

AND NOT EVERYONE LOVES FLASH…

➢ Getting data in and out of Flash is burdensome
➢ JavaScript and ActionScript are different
➢ Flash is power hungry (according to Steve Jobs)
Local Storage

▸ HTML5 enables mobile and web applications to securely store data on local machines in a database format
  ▪ Reduces network overhead
  ▪ Improves response time (data can be cached)
  ▪ Lowers server overhead (computation is local)

▸ Can store answers securely on local machine
▸ Can improve responsiveness

GOOD FOR LEARNING CONTENT!
More Design Choices

- CSS3 and new tags add to design choices and improve consistency
- Using disparate technologies is a headache
- CSS3 provides one style for:
  - Page content
  - Interactive content
  - Accessibility
  - Navigation
3. HTML5 as an Open Standard
## Why Standards?

<table>
<thead>
<tr>
<th>Controlled by an organization</th>
<th>Almost Universal</th>
<th>Competing Adoption</th>
<th>Little Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash, MS Office</td>
<td>SCORM, HD-DVD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled by an industry consortium</td>
<td>AICC, Blu-ray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlled through standards process</td>
<td>HTML, WiFi, WiFi, PDF (now)</td>
<td>4G standards</td>
<td>Open Document Format</td>
</tr>
</tbody>
</table>

- Developed using open process
- Major stakeholders involved and committed
- Transparent maintenance and evolution
- Potential to become legal requirement

*The nice thing about standards is that there are so many from which to choose.*
Who is developing HTML5

World Wide Web Consortium (W3C)

The W3C mission is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web.

Working Group Members include: Adobe, Apple, AT&T, Baidu, BBC, Boeing, Cisco, Comcast, DISA, Disney, Google, HP, Huawei, IBM, Intel, Microsoft, Motorola, Mozilla Foundation, Netflix, Nokia, Samsung, Zynga
Why companies are flocking to HTML5

By JP Mangalindan, Writer August 30, 2011: 11:00 AM ET

A new crop of apps from Amazon, LinkedIn and Box.net are the latest to take advantage of HTML5. They also signal this young language already has business' blessing.

Flash or HTML5

A second look at which one is right for your project

Support for HTML5 has come a long way in the past year, and these days it’s difficult to tell it apart from Flash. It’s changing the way people think about online content, but is it right for your project?

Browser Market Share

99% of browsers support Flash

50% of browsers support HTML5

8% of browsers support iOS & Android

Survey: Three quarters of developers planning HTML5 projects

January 16, 2012 | By Jason Ankeny

iOS Smokes Android When It Comes To HTML5 Gaming, Delivers Up To 3 Times More Performance

By Paul Norris | March 6th, 2012

HTML5 vs. Flash: The state of the debate

By Ryan Boudreaux
May 8, 2012, 10:52 AM PDT

Takeaway: Ryan Boudreaux looks at some of the latest browser support numbers for HTML5 and Flash. Are you a partisan for either? Here are Ryan’s thoughts on the state of the Flash vs. HTML5 debate.

The battle lines were drawn years ago, and the war continues among the staunch Flash developers who maintain their SWF swords, versus the inspired early adopter web developers who strike blows with their <canvas>, <article>, <video>, and <audio> tags, incorporating HTML5 and CSS3 into their web implementations.

http://fusionone.ca/2012/05/html5-vs-flash-the-state-of-the-debate/
4. Demos

Let’s see what this HTML5 looks like!

- http://kevinmehall.net/p/equationexplorer/
- http://www.vectorlight.net/games/nano_tanks.aspx
- http://www.youtube.com/watch?v=fyfu4OwjUEI&feature=player_embedded

Note: Internet access may not be available for demos; please refer to CD for demo sites.
5. Technical Overview
CSS3 is an extension of CSS2

- Backwards compatible

Improvements that make life easier (for developers)
- Border styling
- Columns
- Opacity

New toys for cool effects
- **Text Effects** [Drop shadows]
- Media-Dependent CSS [Going Mobile? Then Use This!]
- Paged Media [Printing on transparencies? This is for you!]
- Accessibility [Speech module]
- User Interface (UI) modules [Text validation, Cursors]

Cascading Style Sheets separate presentation from content and make it easy to control the behavior, look and feel of a page without changing what is on it!
Semantic Markup

<h1>Heather Jones</h1>

tells a computer how to display “Heather Jones”

<div typeof="http://xmlns.com/foaf/0.1/Person">
  <span property='name'>Heather Jones</span>
</div>

tells a computer that Heather Jones is a person

▶ HTML5 includes semantic markup.
Canvas supports 2D image effects
- Draw lines, arcs, circles, custom shapes, text
- Fill with color, gradients, patterns
- Crop, rotate, add images, create animation
- Think of it as Photoshop-Extra-Lite in HTML

Scalable Vector Graphics (SVG) for high quality 2D graphics
- Totally scalable images, defined by vectors, not pixels
- Used in printing industry and games

WebGL for 3D graphics
- Heavy CPU/Graphics requirements
- What you need for games and simulations
- Renders models, textures, light sources, particles

Audio and Video

Audio has new tags
- Playback controls, volume

Video has new tags
- Playback controls, autoplay, loop, muted

Relief for Compatibility Wars!

- Firefox and Opera do not support MP3
- IE9 does not support WAV
- IE9 and Safari do not support OGG
- Solved through multiple formats, from W3C:

```html
<audio controls="controls">
  <source src="song.ogg" type="audio/ogg" />
  <source src="song.mp3" type="audio/mpeg" />
  Your browser does not support the audio element.
</audio>
```
Local Storage

Key Value: Key → Value
- Basic CRUD, that is, Create, Read, Update and Delete
- Great for simple data, settings, themes
- Persists between sessions (data does not disappear)

SQL
- More complex queries (SELECT * FROM settings)
- More powerful search capabilities
- Used as the back-end of many applications
- Allows entirely client-based complex web applications
Other Features

- MathML 3.0
- Web Servers in your browser
- Drag & Drop compatibility for files, other objects
- Touch Events
- Geolocation
- Media Capture (recording video, audio)
- Many more...
Browser Compatibility

- Not supported by IE6 or IE7
- Partial support by IE8
  - No SQL Storage
  - Cross Document Messaging
  - Can use technologies such as Modernizr to bridge the gap (http://modernizr.com/)
6. Making the HTML5 Decision
HTML5 Decision Rubric

Do your required browsers support HTML5? **Show Stopper?**
(no) 1 2 3 4 5 (yes)

Must your content run on Apple devices, like iPads?
(no) 1 2 3 4 5 (yes)

Is HTML5 output produced by your current development environment?
(no) 1 2 3 4 5 (yes)

Can you accept risks associated with evolving tool sets?
(no) 1 2 3 4 5 (yes)

Does HTML5 support your interactivity requirements?
(no) 1 2 3 4 5 (yes)

Must your content be “future proof”? 
(no) 1 2 3 4 5 (yes)

Higher Score = More biased towards HTML5
Technical Compatibility

What are your target browsers (lowest versions)?
The more common and trending versions are in **bold**.

<table>
<thead>
<tr>
<th>Browser</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firefox</td>
<td>3.6</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Chrome</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>other:</td>
</tr>
<tr>
<td>Safari</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opera</td>
<td>11.6</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iOS Safari</td>
<td>3.2</td>
<td>4.0</td>
<td>4.2</td>
<td>5</td>
<td></td>
<td>other:</td>
</tr>
<tr>
<td>Android Browser</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
<td>3</td>
<td>4</td>
<td>other:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Must</th>
<th>Want</th>
<th>Browser Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td></td>
<td></td>
<td>Desktop: IE9, FF3.6, Ch17, Sa5, Op11.6&lt;br&gt;Mobile: iOS4, An2.3</td>
</tr>
<tr>
<td>No plug-ins required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video</td>
<td></td>
<td></td>
<td>Desktop: IE9, FF3.6, Ch17, Sa5, Op11.6&lt;br&gt;Mobile: iOS3.2, Op11, An2.3</td>
</tr>
<tr>
<td>No plug-ins required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSS3</td>
<td></td>
<td></td>
<td>Desktop: IE9, FF8, Ch17, Op11.6&lt;br&gt;Mobile: iOS4, Op11, An2.2</td>
</tr>
<tr>
<td>Fancy styles made easy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web Fonts</td>
<td></td>
<td></td>
<td>Desktop: IE9, FF3.6, Ch17, Sa5, Op11.6&lt;br&gt;Mobile: iOS4.2, Op10, An4</td>
</tr>
</tbody>
</table>

Details in Handout available from I/ITSEC Site
## Support for HTML5

<table>
<thead>
<tr>
<th>Tool</th>
<th>Support</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Captivate</td>
<td>NO</td>
<td>Adobe provides a beta tool to convert Captivate 5.5 to HTML, but not all features are supported.</td>
</tr>
<tr>
<td>Adobe Dreamweaver</td>
<td>YES</td>
<td>Supports HTML5 but requires code editing</td>
</tr>
<tr>
<td>Adobe Edge</td>
<td>YES</td>
<td>Adobe’s HTML5 replacement for Flash, but still in development.</td>
</tr>
<tr>
<td>Adobe Flash</td>
<td>NO</td>
<td>Flash output can be embedded in HTML5, but this will defeat much of the purpose</td>
</tr>
<tr>
<td>Articulate Storyline</td>
<td>YES</td>
<td>Storyline outputs HTML5.</td>
</tr>
<tr>
<td>Trivantis Lectora</td>
<td>YES</td>
<td>Lectora is early supporter of HTML5</td>
</tr>
<tr>
<td>Zebra Zapps</td>
<td>NO</td>
<td>Planned (according to product development team)</td>
</tr>
</tbody>
</table>
6. Tools & Resources
Authoring Tools

➤ The Usual Suspects
  ■ Dreamweaver
  ■ Text Editors

➤ Desktop Applications
  ■ Adobe Edge
  ■ Articulate Storyline
  ■ Trivantis Lectora
  ■ Luminosity

➤ Web Applications
  ■ IBM Maqetta
  ■ Mercury Editor

➤ eLearning Web Apps
  ■ Dominknow Claro
  ■ Udutu

➤ LCMS
  ■ KeneXa (formerly OutStart)
  ■ Xyleme
  ■ ROCCE
  ■ Learn eXact
Adobe Edge

► Best for
  ■ Animation & Design
  ■ Games

► Highlights
  ■ Free (for now)
  ■ Produces clean, editable code
  ■ Flash replacement

► Difficulty Level
  ■ Similar to Flash

► Cautions
  ■ Product is still in development

http://www.adobe.com/EdgePreview6
## Comparison of Dreamweaver & Edge

<table>
<thead>
<tr>
<th>Product</th>
<th>Sample use cases</th>
<th>Supported technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Edge</td>
<td><strong>Motion and interaction design</strong> for new compositions or using existing CSS-based page layouts, content rotators, simple games, advertising</td>
<td>HTML/HTML5, JavaScript, CSS/CSS3, JSON, web graphics including SVG, jQuery-based animation framework</td>
</tr>
<tr>
<td>Adobe Dreamweaver</td>
<td><strong>Websites</strong> and web applications for desktops, smartphones, and other devices</td>
<td>HTML/HTML5, CSS, JavaScript, jQuery, PHP, PhoneGap, site management, FTP, CMS frameworks, SVN (Subversion)</td>
</tr>
</tbody>
</table>

Trivantis Lectora

Best for
- Training Courses
- Rapid Development

Highlights
- Many templates
- Contextual help
- Flexible; can create complex interactions

Difficulty Level
- Medium-High

Cautions
- Price
- Windows-only

http://www.trivantis.com/e-learning-software
Dominknow Claro

**Best for**
- Mobile Development
- Web- and Cloud-based Development

**Highlights**
- Online collaboration
- Monitor content development
- Rich feature set

**Difficulty Level**
- Medium

**Cautions**
- Online-only

8. Summary

- HTML5 adds new functionality to HTML
  - New styles and graphics
  - Solves multimedia compatibility issues
  - Semantic markup
  - Local storage

- HTML5 is a draft standard
  - Widely supported, but not on IE7 and IE8
  - Still evolving (caveat emptor!)
  - Lots of traction in eLearning community

- There are many HTML5 tools
  - Raw HTML5 editors
  - Web and cloud authoring tools
  - eLearning authoring tools

- Evaluate requirements before using HTML5
  - Flash is still a viable option for many applications
Bibliography

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- http://modernizr.com/
- http://www.w3.org/TR/2011/WD-html5-20110525/
- http://www.trivantis.com/e-learning-software
- http://www.dominknow.com/
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