

HTML5, JavaScript, CSS3 Rich Internet Application

Project Proposal - Revision 3

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2 Project Title

The project is proposed with the title:

An HTML5/DeepZoom "Presenter" - A Rich Internet Application

re: A Guide to Getting Your Feet Wet in HTML5, by creating an HTML5/Seadragon interactive and buildable presentation. May be revised at a later date.

3 Statement of the Problem

Client side events in modern browsers (without a full page request) is largely dependent on modern technologies such as Flash and Silverlight "creating engaging, interactive user experiences" [14, 10]. This allows much greater rich internet applications & creates a reliance on this additional software running in a browser, which in turn creates a reliance on browsers to support compatibility for the software, which not all do [1, 5, 11]. This also fragments the developing experience, and further complicates the required knowledge to make a good website. HTML5 is currently being released as it is developed, and provides elements that allow for client side manipulation through JavaScript which is built into most modern browsers [9, 7]. To add to this, CSS3 allows us to style our site in more creative ways [15]. The purpose of this project then, is to investigate the transition into HTML5 and show how one would go about creating a rich Internet application that can reach all platforms, combined with knowledge we already have, and complies with World Wide Web Consortium Standards.

4 Objective of Research

Based on the above, section 3, and the idea of creating a presentation tool with Seadragon [12] to do this, the objectives are as follows:

Primary Goals

- Create an rich presentation tool that uses HTML5 elements with Javascript tools
- Expose HTML5 that is really useful to a Web Developer
- Expose Seadragon application interface and data structure (Deep Zoom Imaging) [12]
- Expose HTML5 elements for Javascript manipulation

Secondary Goals

- Review security changes/addition that take place in the transfer to HTML5
- Compare differing browser and operating systems reports about HTML5
- Explore why Flash is still used
- Find out where Silverlight is going/Microsoft's new thoughts

A mapping of useful HTML5 new elements must be done, and note the elements that allow for greater end-user control and content. Then an exploration into how JavaScript can be used to control these elements, which will help to build the understanding of the abilities of new HTML5 tools, and result in the final tool: An interactive HTML5 page that can be used as a presentation/display tool. Among features we wish to explore and demonstrate are; linked & synchronised elements, with timeline navigation abilities, point to point navigation and other possibilities include; mini map, information conceptualization through visual abstraction, rotation, animation and other useful presentation concepts. This will allow for an overall assessment on the abilities of, and the degree to which, HTML5 can substitute for plug-in technologies, like Flash and Silverlight, while being part of the standard that browsers are modeled on.

5 History and Background

In the past, before World Wide Web connected us all with browsers and HTML, there was the internet [2], which simply connected us, and then any Protocol that can be used to communicate with other devices, as long as they can interpret these messages/protocols [2]. From the original conception of HTML, that came from Tim Berners-Lee's proposal for A Hypertext Medium[3, 4], web design has slowly moved forward in creating several different elements to suit the content available at the time [6, 9]. These moved from HTML 1.0 in 1990 with simple links, headings, and paragraph tags[9], with the 1st web page in 1991 [8], through HTML 2.0 which later RFCs added file upload forms and tables[2, 8].

Next was HTML 3.2 in 1997[8], and was the first to be exclusively developed by the W3C consortium. Followed by HTML 4.0 which allowed strict and transitional modes, introducing the phasing out of older, depreciating tags[13]. Updated to HTML 4.01 in 1999[8, 13], proposed by the W3C, with no massively notable rich internet application advances.[13]

Extensible-HTML (XHTML) has been developed, but did not take on as they lacked the functionality that end users really wanted [13], and in later version implemented a draconian style error handling, i.e. if it wasn't 100 percent correct, the parser would throw an error, unlike HTML [13]. This was an largely an attempt to standardize the different interpretations of HTML browsers had, in order to make them easier to parse by software [13]. But all of these technologies lacked the richness of developments made during the time gap.

Cascading Style Sheets (CSS) allowed for a easy way to distribute styling into your HTML elements, and make them look like they were part of the whole. This allowed for much more scalable styling in websites. And went for several revisions allowing for more styles such as relative positions and overlapping elements [13, 15], later moving into animations and transitions in CSS3 in the 2004 area [13].

Flash was created in 1997 and allowed us to chunk video/audio data through the flash plugin into your browser [8], for it to display by the plugin, and create immensely interactive content with vector graphics, that could be highly animated, and is currently used in most of browsers[8]. Flash allows for instructions, and additional information, to be downloaded and the plugin would perform things such as; animation, streaming media, client side events, and to quote Flash: "provides viewing of expressive applications, content, and videos across browsers" [10]. And Silver light fills a similar roll [14].

Unfortunately the specification has not had an update since HTML 4.01 proposed in 1999 [8], until 2008 where browsers started to implement HTML5 as it was being developed, starting with canvas on Safari [8, 9].

In essence society needs to achieve better client side functionality and interactivity to have rich internet applications, in a standardized manner, but the elements needed to perform this functionality do not exist in HTML 4.01, hence Flash's previous success in creating an interactive container. HTML5's initial working draft was released on the 22nd of January, 2008 and has had multiple revisions, the most recent of which was on the fifth of April 2012, but there does exist an editor's draft, released on 29 February, 2012. This includes Video and Audio tags, and Canvas elements which, when combined with some Javascript and CSS styling claims to perform the same task Flash has become famous for [6, 8].

6 Intended Approach

The initial phase of the project will be a literature study in order to gain familiarity with HTML5 and a greater level of understanding. This literature study phase will be continuous through the project, as HTML5 is a new is continually releasing new articles and revisions.

The second phase will involve creating test scenarios with appropriate HTML5 elements, including the canvas and video elements, with different JavaScript presentation technologies (The intended focus being DeepZoom data abstraction style presentation). Initial tests will start small to create the basic building blocks for future implementations. This second phase will repeat until either all tools needed to compete with Flash and Silverlight have been explored, or an extremely large tool is developed that shows off this ability.

The final phase will involve the multi-platform testing and comparison of security, efficiency, and effectiveness, and returns to the second phase for optimisation, and as well as to gain a larger view of HTML5 at work. But these are side pieces to proving Flash and Silverlight don't have to be part of a good web developers arsenal anymore and that HTML5 will be the way of the future.

7 Requirements

There are no foreseen financial requirements as all implementations can be done on current hardware already available. A virtual machine for Linux will be needed in the testing phase for cross operating system testing. Knowledge of HTML5, JavaScript, Flash and Silverlight programming languages will be necessary, with emphasis on HTML5 and JavaScript. There is a possibility that the tool will need to be hosted, which requires freely available web hosting, due to the Single Origin policy and Seadragons breach of it, but more research is needed here.

8 Progression Timeline

Below are initial goals and milestones:

- Initial test site and scripts - Before the end of March & continually
- Good understanding of JavaScript and HTML5 - Before the end of March
- Test tools with SeaDragon implemented - April
- Single origin policy research & Seadragon functionality understanding - Ready for July presentation
- Literature Review - 28th May
- Seminar presentation - End of July

9 References

- [1] Aruna Prem Bianzino, Anand Kishore Raju, D. R. Greening the Internet surf: Experimental measurements of Web power-consumption, hal-00573051, version 1 ed. Telecom Paris-Tec, March 2011.
- [2] Barry M. Leiner, Vinton G. Cerf, D. D. C. R. E. K. L. K. D. C. L. J. P. L. G. R. S. W. A Brief History of the Internet. Online, Jan 1999. Available from: <http://arxiv.org/abs/cs/9901011>.
- [3] Berners-Lee, T. Tim Burners Lee Biography. Online. Available from: <http://www.w3.org/People/Berners-Lee/>.
- [4] Berners-Lee, T. WorldWideWeb: Proposal for a HyperText Project. Online, 1990 November. Available from: <http://www.w3.org/Proposal>.
- [5] Bott, E. How Secure is Flash? Here's what Adobe won't tell you. Online, May 2010. Available from: <http://www.zdnet.com/blog/bott/how-secure-is-flash-heres-what-adobe-wont-tell-you/2152>.
- [6] David, M. HTML5 Designing Rich Internet Applications. Focal Press (Elsevier, Inc.), 2010.
- [7] Google. How do I enable JavaScript in my browser? Online, 2012. Available from: <http://support.google.com/adsense/bin/answer.py?hl=en&answer=12654>.
- [8] Google Chrome Team, mgmt design, G. H. V. The Evolution of The Web. Online, 2011. Available from: <http://evolutionofweb.appspot.com/>.
- [9] Hickson, I. A vocabulary and associated APIs for HTML and XHTML. Online, February 2012. Available from: <http://dev.w3.org/html5/spec/Overview.html>.
- [10] Incorporated, A. S. Adobe Flash Player. Online. Available from: <http://www.adobe.com/software/flash/about/>.
- [11] Jobs, S. Thoughts on Flash. Online, April 2010. Available from: <http://www.apple.com/hotnews/thoughts-on-flash/>.
- [12] Microsoft-Expression. Seadragon Ajax. Online, May 2010. Available from: <http://gallery.expression.microsoft.com/SeadragonAjax>.
- [13] Pilgrim, M. HTML5: Up and Running. O'Reilly Media, August 2010.
- [14] Silverlight. Get Silverlight 5. Online. Available from: <http://www.microsoft.com/silverlight/>.
- [15] W3Schools. CSS Positioning. Online. Available from: http://www.w3schools.com/css/css_positioning.asp.
- [16] Waldron, R. The Flash History. Online, November 2000. Available from: http://www.flashmagazine.com/news/detail/the_flash_history/.