

A Modern interactive approach in Web Design using HTML5

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Abstract

Web technology is a approach that allow us developing web applications with the help of previously available properties in a markup language and style sheet language. It also provides an interface that allows the sharing of information between a Web server and its clients. HyperText Markup Language (HTML) is the markup language for web pages. HTML elements are the basic building-blocks of webpages. HTML standard were and are created by World Wide Web consortium (W3C).HTML5 is the latest and most enhanced version of HTML.Technically, HTML is not a programming language. HTML5 is markup language for structuring and presenting content for the World Wide Web, and is a core technology of the Internet originally proposed by Opera Software .It is the fifth revision of the HTML standard. There are lots of new features which are given in HTML 5. This paper presents the key differences of HTML5 with the previous HTML standard.

Keywords: HTML, HTML5, Web technology,WWW, Web Pages, Web Application

1. Introduction to Markup Language:

A markup language is a set of tags that can be used to provide additional information about the text in order to facilitate automated processing of it, including editing and formatting for display. It is human-readable, meaning markup files contain standard words, rather than typical programming syntax. A tag is a special sequence of characters. In markup language every tag begins with a leftward pointing angular bracket, contains one or more alphanumeric characters, and ends with a rightward pointing angular bracket. Markup languages are fundamental to displaying documents in web browsers, However, such languages and their tags are typically hidden from the user. Most familiar markup language is HTML which is stand as hypertext markup language, which is used to allow documents to be displayed in web browsers. The term markup is derived from the traditional publishing practice of marking up manuscripts by writing instructions for typefaces, fonts, sizes, styles, etc.

An example:

HTML tags that is used to indicate bold text: `<b>` and `</b>` to indicate bold text. Other examples of commonly used tag pairs are `<p>` and `</p>` to indicate the start and end of a paragraph, and `<i>` and `</i>` to indicate that the enclosed text should be rendered in

italics. Every HTML document begins with the tag `<html>` and ends with the tag `</html>`. Some tags are designed to be used individually because they do not enclose any content. An example is `<br />`, which stands for break and is used to indicate the start of a new line of text.

2. HTML Overview

HTML 1.0 - 4.0 (and XHTML) was all specifications for laying out text and images on a page. During research it included some attempts at providing semantic data which allows basically for automated categorization and correlation of HTML documents. HTML5 actually strives to be something very different. It aims to be more of an application development platform, which includes not only laying out text and images, but also playing video and audio, interactive 2d and 3d graphics, storing data in the application, dealing with online and offline access to data, and real-time networking protocols for exchanging data as it happens.

3. History of HTML

HTML has been in continuous evolution since it was introduced to the Internet in the early 1990s. Some features were introduced in specifications; others were introduced in software releases.

The specifications are:

1. Defines a single language called HTML which can be written in HTML syntax.
2. Defines detailed processing models to foster interoperable implementations.
3. Improves markup for documents.
4. Introduces markup and APIs for emerging idioms, such as Web applications.

HTML4 has been a standard web development for more than 10 years. HTML4 is approved as a standard language for browsers by the World Wide Web Consortium (W3C), an organization which specifies and approves standards for web technologies. Now apart from targeting desktop PCs and laptops, web-developers have to keep in mind that their website would be accessed by mobile-user; and with the growing number of mobile users, this concern is growing proportionally. Though, HTML4 doesn't fully cater to the changing trends of the computing industry. Therefore, HTML5 has been developed with intent to cop-up with these new challenges in web industry. HTML5 is more flexible, robust and advanced as compare to its older counterpart.

4. General Differences between HTML5 and HTML4

Following are some of the major characteristics that distinguish HTML5 from HTML4.

1. Simplified and Clear Syntax:

The syntax in HTML5 is extremely clear and simple as compared to HTML4. One example of this is the DOCTYPE element. In HTML4 the DOCTYPE declaration was too messy and lengthy and used to refer an external source. However in HTML5 DOCTYPE element has been made extremely simple. For instance a mere `<!DOCTYPE html>` is enough to specify the document type.

2. Multimedia Elements in HTML5

HTML5 contains built in support for integrated multimedia files into web page via video and audio tags. Previously, in HTML4, the multimedia content was integrated in web pages via third party plugins such as Silverlight and flash.

3. Accessing User Geographical location

Previously in HTML4, it was an extremely cumbersome task to get the geographical locations of the visitors visiting the site. It was even difficult when the website was accessed through mobile devices. On the other hand, in HTML5 is extremely easy to get the user location. HTML5's JS GeoLocation can be leveraged to identify the location of the user accessing the website.

4. Client Side storage in HTML5:

In HTML4, in order to store important data on client side, browser's cache was used. However, that cache is limited and doesn't support relational storage mechanism. In HTML5, this issue has been addressed via Web SQL database and application cache that can be access via HTML5's JavaScript interface.

5. Client Server Communication

In HTML4 the communication between the client and server was done through streaming and long polling, since there are no web sockets available in HTML4. On the contrary, HTML5 contains web sockets that allow full duplex communication between clients and servers.

6. JavaScript Threading Mechanism

In HTML4, JavaScript and the browser interface with which user interacts, run in the same thread which affects performance. HTML5 contains JS Web Worker API which allows JavaScript and Browser interface to run in separate threads.

7. Browser Compatibility in HTML5

HTML4 is an established standard for developing browser applications and has been in use for more than 10 years. For this reason, HTML4 is compatible with almost all web-browsers. On the other hand, HTML5 is still in the process of evolution and the currently available tags are being modified and also new tags are being added. Therefore, HTML5 lags behind HTML4 in terms of compatibility with the browsers.

5. Tag Differences in HTML4 and HTML5

Several tags in HTML4 have been removed from HTML5 or their functionality has been modified. Following are some of the tags that are removed from HTML5 or have different functionality in HTML5 as compared to HTML4.

1. <Applet> removed <Object> Added in HTML5

HTML4 contained an `<applet>` tag that was used for displaying applets in a web browser. However, in HTML5, this applet tag has been removed. In order to display applet type items, a new `<object>` tag has been introduced in HTML5.

2. <Acronym> removed <Abbr> Added in HTML5

HTML4 contained an `<acronym>` tag that was used for displaying abbreviation's in a web browser. However, in HTML5, this tag has been removed. A new `<abbr>` tag has been introduced in HTML5.

3. Difference in usage of <hr> tag

The `<hr>` tag was used to draw a line in HTML4 and all the previous versions of HTML, however in HTML5, the functionality of this tag has been changed and it

is used for defining a thematic break in the web page.

4. Difference in usage of <a> tag in HTML5:

In HTML4 and previous versions, the <a> tag was used as anchor as well as for referring to a link. In the HTML5, the <a> tag is used only as a hyperlink. But if the href tag is removed from the <a> tag, the <a> tag can be used as a place holder for other hyperlinks.

5. The <header> and <footer> Elements

For good or bad, HTML5 has acknowledged the new web anatomy. With HTML5, <header> and <footer> are specifically marked for such. Because of this, it is unnecessary to identify these two elements with a <div> tag.

6. New <section> and <article> Elements

Again, HTML5 has adopted the popular web standard. <section> and <article> allows you to mark specific areas of your layout as such, and should have a positive effect on your SEO in the end.

8. New <menu> and <figure> Elements

<menu> can be used for your main menu, but it can also be used for toolbars and context menus. The <figure> element is another way to arrange text and images.

9. New <audio> and <video> Elements

Embedding audio and video has never been easier. There are also some new multimedia elements and attributes, such as <track>, that provides text tracks for the video element. With these additions HTML5 is definitely getting more and more Web 2.0-friendly. The problem is that by the time HTML5 becomes widely accepted, Web 2.0 might be old news.

6. Changes in attributes

Following are some of the attributes that have been modified in HTML5.

- In HTML4 and previous HTML versions, script attribute was used to in link tag to refer to JavaScript or other similar scripts. In HTML5 It is not necessary to use that script attribute.
- In HTML5, the <table> tag can only have one attribute Border and the value of this attribute can only be zero or one. Previously, the <table> tag had many attributes.
- In the previous versions of HTML, the <meta> tag didn't had the charset attribute that defines the standard character encoding for the webpage. This attribute has been added in HTML5.

7. HTML5 New Tags:

1. <canvas> Tag:

A canvas is a rectangular area on an HTML page. The <canvas> tag is used to draw graphics using

JavaScript. It is only a container for graphics. Inside this container, graphics are drawn using JavaScript. Canvas has different methods for paths, circles, boxes, characters and adding images. By default it has no border and no content. The markup looks like this:

```
<canvas id="canvas1" width = "400" height = "300">Update your browser</canvas>
```

The id attribute is used to refer the canvas in the script and width and height are used to define the size of the canvas. You can have multiple canvases on one html page.

2. New Media Elements in HTML5:

HTML 5 has included several new media elements for displaying media content. Following are some of the most important media elements included in HTML5.

- <audio>
- <embed>
- <source>
- <track>
- <video>

<video> Tag:

HTML5 defines a new element which specifies a standard way to embed a video file on a web page. The file formats supported for the <video> element are:

- Mp4
- WebM
- Ogg

<audio> Tag:

HTML5 defines a new element which specifies a standard way to embed an audio file on a web page. The file formats supported for the <audio> element are:

- Mp3
- Wav
- Ogg

<article> Tag:

The <article> element shows the portion of a web page that contains a complete and independent material.

- An article from magazine or newspaper
- A blog entry
- Any comment by user
- Or some other content item.

<main> Tag

The <main> tag is also a new addition in HTML5. The <main> tag describes the material which is specific to only that document. The material which is used again and again in the documents should not be included in the <main> tag. The <main> tag can be used only one

time in a page. There should be no other <main> on the same page. Another rule to be followed is that <main> tag cannot be used as descendant of an <article>, <aside>, <header>, <footer>, or <nav> element. Example 8 demonstrates the usage of <main> tag.

<mark> Tag:

The <mark> element allows you to highlight text in a webpage. The tag has also been introduced in HTML5 and did not exist previously. It's going to be a while before HTML5 is the new standard and everything HTML5 has to offer is supported by all the important browsers.

8. Application of HTML:

1– Accessibility

HTML5 makes creating accessible sites easier for two main reasons: semantics and ARIA. The new HTML headings like <header>, <footer>, <nav>, <section>, <aside>, etc. allow screen readers to easily access content. Before, your screen readers had no way to determine what a given <div> was even if you assigned it an ID or Class. With new semantic tags screen readers can better examine the HTML document and create a better experience for those who use them.

ARIA is mainly used to assign specific “roles” to elements in an HTML document – essentially creating important landmarks on the page: header, footer, navigation or article, via role attributes. This has been well overlooked and widely under-used mostly due to the fact that it wasn't valid, however, HTML5 will validate these attributes.

2 – Video and Audio Support

It will make your videos and audio truly accessible with the new HTML5 <video> and <audio> tags. Getting your media to play correctly has always been pretty much a nightmare, you had to use the <embed> and <object> tags and assign a huge list of parameters just to get the thing visible and working correctly. Your media tags just become these nasty, huge chunks of confusing code segments. HTML5's video and audio tags basically treat them as images; <video src="url"/>.

Some resources worth checking out:

- HTML5 Audio and Video: What you Must Know
- Audio and Video processing in HTML5
- How to Make Your Own Video Player On HTML5 Video
- Using HTML5 Video and Audio in Modern Browsers
- Browserscene: Creating a 3D sound visualiser

with WebGL and HTML5 audio

3 – Doctype

<!DOCTYPE html>

Yup that's it, that is the doctype, nothing more, nothing less. Pretty simple right? No more cutting and pasting some long unreadable line of code and no more dirty head tags filled with doctype attributes. You can simply and easily type it out and be happy. The really great thing about it though, beyond the simplicity, is that it works in every browser clear back to the dreaded IE6.

4 – Cleaner Code

If you are passionate about simple, elegant, easy to read code then HTML5 is the beast for you. HTML5 allows you to write clear and descriptive code, semantic code that allows you to easily separate meaning from style and content.

5 – Smarter Storage

One of the coolest things about HTML5 is the new local storage feature. It's a little bit of a cross between regular old cookies and a client-side database. It's better than cookies because it allows for storage across multiple windows, it has better security and performance and data will persist even after the browser is closed. Because it's essentially a client side data base you don't have to worry about the user deleting cookies and it has been adopted by all the popular browsers.

Local storage is great for many things, but it's one of HTML5 tools that are making web apps possible without third party plugins. Being able to store data in the user's browser allows you to easily create those app features like: storing user information, the ability to cache data, and the ability to load the user's previous application state.

6 –Game Development

Yup, that is correct you can develop games using HTML5's <canvas> tag. HTML5 provides a great, mobile friendly way to develop fun, interactive games. If you've built Flash games before, you'll love building HTML5 games.

7– Browser Support

Your modern, popular browsers all support HTML5 (Chrome, Firefox, Safari IE9 and Opera) and the HTML5 doc type was created so that all browsers, even the really old and annoying ones, er, IE6 can use it. But just because old browsers recognize the doc type that doesn't mean they can use all the new HTML5 tags and goodies. Fortunately, HTML5 is being built to make things easier and more cross browser friendly so in those older IE browsers that don't like

the new tags we can just simply add a Java script shiv that will allow them to use the new elements:

9. Conclusion

HTML5 is proved as one of the powerful tool for webpage design. With HTML5, streaming of audio and video without need of third party plug-in such as flash is possible. In HTML5 we have new structural elements instead of traditional div tags to create page template, the final result will be a cleaner and more organized code. HTML5 allows storing data locally from client side. The data can be accessed to support the web application and it can even be accessed when the client is disconnected for a short period of time. There are methodologies for storing data: session storage, local storage and database storage. HTML5 introduces new elements and

features that allow developers to improve interoperability, handling elements in a precise way saving time and costs.

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