Comparative Study
Between HTML and HTML5: A Review

Harash Kumar

Assistant Professor Department of Computer Science,
Khalsa College, Chawinda Devi ,Amritsar, Punjab, India

Abstract— In the field of web technology HTML is everywhere these days. HyperText Markup Language (HTML) is the main 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 new and elegant standard for HTML that provides web users and developers enhanced functionality. The older versions of HTML are now replaced with HTML5. It is the fifth revision of the HTML standard. There are lots of differences which are given in HTML 5. It was brought to deliver rich content without the need for additional plug-ins and proprietary technologies. The new power of HTML5 supplies the user everything from animation to graphics, music to movies, and can also be used to build complicated web applications and also supports cross-platform. HTML5 standard initiates the development of real-time collaborations in web browsers, which leads to less work for web developers.

Keywords—WWW, Web pages, HTML, HTML5 features, accessibility

INTRODUCTION:-

Web technology is a standard that allows to develop Web applications with the help of predefined sets of classes, objects, methods and properties available in a markup language ,style sheet language , or programming language. The three core languages that make up the World Wide Web are HTML5, CSS, and JavaScript.

HTML is the backbone of most webpages. Essentially, it is used to create the structure of how a specific website would look like, from the headings, to the paragraphs, the body, links, and even images. HTML standard were and are created by World Wide Web consortium (W3C). It is derived from a more general markup language called Standard Generalized Markup Language (SGML), which is an International Organization for Standardization (ISO) technology that defines markup languages.

HTML MAJOR VERSIONS
HTML 2.0

Published in 1995, HTML 2.0 flushed out the RFC system, allowing detailed mechanical explanations of the system.

HTML 3.2

Published in 1997, HTML 3.2 performed major housecleaning on the structure of HTML. It removed mathematical formulas, reconciled code overlap, and adopted Netscape's Visual Markup Tags.

HTML 4.0

Published at the end of 1997, HTML 4.0 introduced 3 different versions and browser specific plugins. 4.0 Allowed custom experiences tailored to specific browsers.

XHTML

Released in 2000, XHTML fused HTML and XML into a language that was very precise, almost too precise. XHTML is widely considered a tedious and difficult language.

HTML 5.0

Released in 2014, HTML 5.0 is the currently used version of HTML. HTML 5.0 removed some of the tedium and severity of XHTML, while keeping its ability to remain precise and detailed.

Introduction to HTML 5.0

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. Its core aims have been to improve the language with support for the latest multimedia while keeping it easily readable by humans and consistently understood by computers and devices (web browsers, parsers, etc.). HTML5 is a cooperation between the World Wide Web Consortium (W3C) and the Web Hypertext Application Technology Working Group (WHATWG).WHATWG was working with web forms and applications, and W3C was working with XHTML 2.0. In 2006, they decided to cooperate and create a new version of HTML.

Some rules for HTML5 were established:
- New features should be based on HTML, CSS, DOM, and JavaScript.
- Reduce the need for external plugins (like Flash).
- Better error handling.
- More markup to replace scripting.
- HTML5 should be device independent.
- The development process should be visible to the public.

With the development of HTML5 it has wide range of applications in multimedia direction . It can play audio and video and supports animations from the browser without the need of the proprietary technologies. The features of HTML5 would add up value for web designers and developers.

HTML5 supports cross platform, designed to display web pages on a PC, or a Tablet, a Smartphone, or a Smart TV (**Fig-1**). HTML5 is been a working draft and some browser designers and websites are already adopting HML5 elements. HTML5 also support location based services open formats such as Scalable Vector Graphics (SVG), open XML file formats and high quality graphics.

Fig 1. HTML 5 Cross platform

The basic advantage for the developers and browsers is that they would be able to do more without the need of mastering or licensing multiple proprietary technologies that can develop rich web pages, enhanced forms and web based applications.

HTML5 FEATURES
HTML5 provides **new features** that include

- Canvas – 2D/3D Graphics
- Audio & Video
- Location based Services
- Working Offline
- Web Workers
- Drag & Drop
- New Input Types
- New Elements
- Form Elements

Canvas
HTML5 **<canvas>** element is used to draw graphics via java script on web pages that incorporate video and animations. Canvas is only a container for graphics and script is to be used to render 2D/3D graphics. Canvas provides several methods for drawing paths, boxes, circles, text and images which makes graphics-heavy pages render fast.

Fig.2 Html 5 Canvas

International Journal of Research
Available at https://edupediapublications.org/journals

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 7
March 2018

SVG (Scalar Vector Graphics)

SVG defines vector-based graphics for the web. The clarity of SVG object do not change i.e., even if images are enlarged or compressed, quality of the image will not be lost .

SVG images can be searched, indexed, scripted, compressed and scalable. SVG images can be printed with high quality at any resolution and even they are zoomable
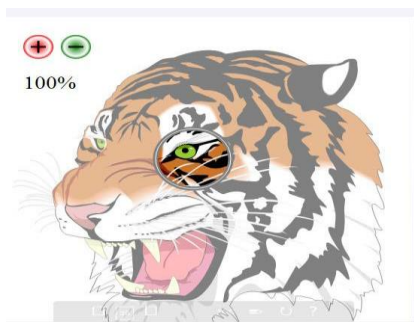
Fig 3. SVG Image before zoom

Fig 4.SVG after zoom
   (Notice the quality of the image)

 Audio & Video

Before HTML5 there is no standard for playing audio and video files on a webpage which generally requires a plug-in for different formats of audio and video[2] . HTML5 now provides a standard way to embed audio files and video files which includes non proprietary formats in the web page.

The tags **<audio>, <video>** and **<source>** tell the browser the associated information is to be handled as an HTML5 compatible streams. These would let users view and listen the audio and video embedded on the page without the use of specific players.

<**audio controls**>
    <**source** src="music.mp3"
        type="audio/mpeg">
    Your browser does not support the audio element. </**audio**>

Fig 5. Output of Audio Tag

<**video**   width="480"
  height="480"   **controls**>
  <**source**   src="movie.mp4"
  type="video/mp4">
</video>

Fig 6. Output of Video Tag

Location-based Services

GeoLocation API is designed to provide user's location. It makes the information of mobile device's geographic location available to a Web application. It offers support for mobile browsers and Location-based applications by enabling interaction with GPS and JavaScript extensions. This API in HTML5 identifies the location of user browsing any website provided user allows it.

Working Offline

HTML5 as a standard also introduces new methods for enabling a web site or web application to function even without a network connection. Using the cache interface, HTML5 gives your application advantages of using cache for

Offline browsing, higher speed, reducing server load etc. **AppCache** (Application Cache) allows applications to store data and programming code locally so that the web applications can work as desktop applications.

Web Storage

HTML5 provides **Web Storage** feature that can store data within the user's browser which is better than cookies used in older version. These support for client-side SQL database and offline application. Web Storage is more secure and faster. It is also possible to store large amounts of data, without affecting the website's performance offline. The data is stored in pairs of name/value, and a web page can only access data stored by it.

Web Workers

In a HTML page while executing scripts, the page becomes unresponsive until the script execution is completed. Web Workers are basically an API specification that lets users create background JavaScript threads to process CPU intensive tasks. These can't be interrupted by other scripts or user interactions. Normally in browsers to handle all the JavaScript code a single thread is created and all of them are run on a single thread. Whether you are doing some calculation or updating page elements, it speeds up background tasks.

Drag and Drop

HTML5 comes with a Drag and Drop API that brings native drag and drop support to the browser, making it much easier to support on devices such as mobile phones. This includes dragging of content and files from outside the browser, e.g. drag and drop to upload files or photos. In HTML5, drag and drop is part of the standard, and any element can be draggable. This is supported by many web applications.

International Journal of Research
Available at https://edupediapublications.org/journals

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 7
March 2018

HTML	HTML5
DOCTYPE is much longer as HTML4 is based on SGML-based. <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">	DOCTYPE is required to enable standards mode for HTML documents. <!DOCTYPE html>
Audio and Video are not part of HTML4 specification.	Audio and Videos are integral part of HTML5 specifications e.g. <audio> and<video> tags.
Vector Graphics is possible with the help of technologies such as VML, Silverlight, Flash etc	Vector graphics is integral part of HTML5 e.g. SVG and canvas
It is almost impossible to get true GeoLocation of user browsing any website especially if it comes to mobile devices.	JS GeoLocation API in HTML5 helps identify location of user browsing any website (provided user allows it)
Browser cache can be used as temporary storage.	Application Cache, Web SQL database and Web storage is available as client side storage. Accessible using JavaScript interface in HTML5 compliant browsers.
Web Sockets are not available. Generally used mechanisms are long polling and streaming.	Full duplex communication channels can be established with Server using Web Sockets. Accessible using JavaScript interface in HTML5 compliant browsers.
Does not allow JavaScript to run in browser. JS runs in same thread as browser interface.	Allows JavaScript to run in background. This is possible due to JS Web worker API in HTML5
Works with all old browsers	Most of modern browser have started supporting HTML5 specification e.g. Firefox, Mozilla, Opera, Chrome, Safari etc.

Table -1. Difference between HTML and HTML5

Difference in HTML and HTML5 Tags:

- <!DOCTYPE html> : In HTML 4.01, there are three different <!DOCTYPE> declarations but in HTML5 there is only one <!DOCTYPE html> Tag.

- <a >: In HTML 4.01, the <a> tag could be either a hyperlink or an anchor. In HTML5, the <a> tag is always a hyperlink, but if it has no href attribute, it is only a placeholder for a hyperlink.

- <acronym> : The <acronym> tag is not supported in HTML5. Use the <abbr> tag instead. The <acronym> tag was used to define acronyms in HTML 4.01.

- <applet>: The <applet> tag is not supported in HTML5. Use the <object> tag instead.

- <strong>: In HTML 4.01, the <strong> tag defines strong emphasized text, but in HTML5 it defines important text.

- <body> : In HTML5, all <body> specific attributes are removed, while in HTML 4.01 they were deprecated

- <hr>: In HTML 4.01, the <hr> tag represented a horizontal rule. In HTML5, the <hr> tag defines a thematic break. The <hr> element is used to separate content (or define a change) in an HTML page.

- <map> : In HTML5, if the id attribute of the <map> tag is also specified, it must have the same value as the name attribute.

New Semantic/Structural Elements

HTML5 offers new elements for better structure:

Tag	Description
<article>	Defines an article
<aside>	Defines content aside from the page content
<bdi>	Isolates a part of text that might be formatted in a different direction from other text outside it
<command>	Defines a command button that a user can invoke
<details>	Defines additional details that the user can view or hide
<summary>	Defines a visible heading for a <details> element
<figure>	Specifies self-contained content, like illustrations, diagrams, photos, code listings, etc.
<figcaption>	Defines a caption for a <figure> element
<footer>	Defines a footer for a document or section
<header>	Defines a header for a document or section
<hgroup>	Groups a set of <h1> to <h6> elements when a heading has multiple levels
<mark>	Defines marked/highlighted text
<meter>	Defines a scalar measurement within a known range (a gauge)
<nav>	Defines navigation links
<progress>	Represents the progress of a task
<ruby>	Defines a ruby annotation (for East Asian typography)
<rt>	Defines an explanation/pronunciation of characters (for East Asian typography)
<rp>	Defines what to show in browsers that do not support ruby annotations
<section>	Defines a section in a document
<time>	Defines a date/time
<wbr>	Defines a possible line-break

Removed Elements:
The following HTML elements are removed from HTML5:

- <acronym>
- <applet>
- <basefont>
- <big>
- <center>
- <dir>
- <font>
- <frame>
- <frameset>

- <strike>
- <tt>

Conclusion:

HTML5 is an awesome technology and has the possibility to make the web even more predominant and extensive as it is today from desktop computers to mobile devices and in the future maybe even domestics appliances. HTML5 introduces new elements and features that allow developers to improve interoperability, handling elements in a precise way saving time and costs . With HTML5, streaming of audio and video without need of third party plug-in such as flash is possible. 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. 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.

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Author Profile :

Harash Kumar is Working as an Assistant Professor in the Department of Computer Science and Applications at Khalsa College, Chawinda Devi ,Amritsar. He Has Passed B.C.A. from Guru Nanak Dev University Amritsar in 2011 and M.C.A. from Punjabi University Patiala 2014. He Has also Qualified UGC-NET in the Subject of Computer Science and Applications in January 2018.He has Three Years of Experience as Assistant Professor. His area of interest includes Web Technologies and Programming.