**Web Page**

Document or information resource that is suitable for the World Wide Web.This is ussualy HTML it may also has resources such as style sheets (CSS), scripts (JavaScript) and images into their final presentation.

**Web Site**

Collection of related web pages containing web resources (web pages, images, videos, CSS files, JS files or other digital assets) Common navigation between web pages. A website is hosted on at least one web server. Accessible via a network (such as the Internet). All publicly accessible websites collectively constitute the World Wide Web

**Web Browsers**

Program designed to enable users to access, retrieve and view documents and other resources from the Web.Bring information resources to the user (issuing requests to the web server and handling any results generated by the request).Presenting web content (render HTML, CSS, JS).Capable of executing applications within the same context as the document on view (Flash).

**Layout Engines**

Software component that displays the formatted content on the screen combining: Marked up content (such as HTML, XML, image files, etc.).Formatting information (such as CSS, XSL, etc.).It "paints" on the content area of a window, which is displayed on a monitor or a printer.Typically embedded in web browsers, e-mail clients, on-line help systems or other applications that require the displaying (and editing) of web content

**EdgeHTML –** win10**,**

**WebKit-based-** Safari, iOS, Maxthon, Chrome

**Gecko-based -**Firefox, Netscape, SeaMonkey

**User Agent Strings**

Identify web browsers and their version.History of (in)compatibility attempts.Can have some additional information like layout engine, user's operating system, etc

**Hardware Servers**

Physical computer (a hardware system) dedicated to running one or more such services.Servers are placed in collocation centers.Colocation facilities provide space, power, cooling, and physical security for the server.Database server,File server,Mail server,Print server,VPS servers

**What Do the Web Servers Do**

All physical servers have hardware.The hardware is controlled by the operating system.Web servers are software products that use the operating system to handle web requests.Web servers serve Web content.These requests are redirected to other software products (ASP.NET, PHP, etc.), depending on the web server settings

**Client-Server Architecture**

The client-server model consists of:

Server – a single machine or cluster of machines that provides web applications (or services) to multiple clients

Clients –software applications that provide UI (front-end) to access the services at the server

**The 3-Tier Architecture**

**Front-end (client layer)**-Client software – provides the UI of the system.**Middle tier (business layer)**Server software – provides the core system logic.Implements the business processes / services.**Back-end (data layer)-**Manages the data of the system (database / cloud)

**Typical Layers of the Middle Tier**

Presentation Logic,Business Logic, Data Access Logic

**Service-Oriented Architecture (SOA)**

A piece of work performed by a service provider.Provides the client (consumer) some desired result by some input parameters.The requirements and the result are known.Easy to use.Always available.Has quality characteristics (price, execution time, constraints, etc.)

**Cloud**

Multiple hardware machines combine their computing power and resources.Share them between multiple applications.To save costs and use resources more efficiently.Public clouds-Provide computing resources on demand.Publicly in Internet.Paid or free of charge (to some limit).Amazon AWS, Google App Engine, Microsoft Azure, Rackspace, PHPFog, Heroku, AppHarbor

**Cloud Computing Models**

**Infrastructure as a Service (IaaS)**-Virtual machines in the cloud on demand.Users install the OS and software they need.**Platform as a Service (PaaS)**-Platform, services and APIs for developers.E.g. Java + JBoss + JSF + JPA + MongoDB or JavaScript + Node.js + MongoDB + RabbitMQ.**Software as a Service (SaaS)**-Hosted application on demand (e.g. WordPress)

**HTML**

Hyper Text Markup Language.A notation for describing-document structure (semantic markup),formatting (presentation markup).The markup tags provide information about the page content structure.A HTML document consists of many tags.An HTML document must have an .htm or .html file extension.

**HTML Terminology**

**Tags**-Opening tag and closing tag.The smallest piece in HTML**Attributes-**Properties of the tag-Size, color, etc… **Elements**-Combination of opening, closing tag and attributes.Tags are the smallest piece in HTML Document.Start with "<" and end with ">".Attributes are properties of HTML ElementsUsed to set size, color, border, etc…Put directly in the tags.Has value surrounded by " " or ' '.The value is always a string.There are some attributes that are common for every HTML element.Id, class, name, style.And some attributes are specific-For example the attribute src of the img element.Shows the path to the image to be shown.HTML Elements are combination of tags and attributes.

**HTML Document Structure**

**The html element**-Used to mark the beginning and ending of a HTML document.All the content of the web page is inside this tag.

**The head tag** contains markup that is not visible to the user (i.e. the person using the browser).But helps the browser to render correctly the HTML document-Styles, scripts,Declare encodings,The title tag - the text in the tab of a browser.

**The body element-** contains all the visible to the user markup.Headings, text, hyperlinks, images.Textboxes, sliders, buttons.

**Doctype-** is kind of the validator of the page.Tells the browser in which version of HTML the page is written.HTML 5 Doctype

**HTML Tables**

Tables represent tabular data.A table consists of one or several rows.Each row has one or more columns.Tables are comprised of several core tags:<table></table>: begin/end table definition.<tr></tr>: create a table row.<td></td>: create tabular data (cell).Tables should not be used for layout.Use CSS floats and positioning styles instead

**Data Cells and Header Cells**

Data cells – containing the table data.Header cells – used for the column names or some more important cells.Why two kinds of cells?Used to semantically separate the cells.

**Complete HTML Tables**

Table rows split into three semantic sections: header, body and footer**.<thead>** denotes table header and contains **<th>** elements, instead of **<td>** elements. **<tbody>** denotes collection of table rows that contain the very data. **<tfoot>** denotes table footer but comes BEFORE the **<tbody>** tag **<colgroup>** and **<col>** define columns (used to set column widths).

**Nested Tables**

Table "cells" (<td>) can contain nested tables (tables within tables)

**Cell Spacing and Padding**

**Cellspacing-**Defines the empty space between cells. **Cellpadding**-Defines the empty space around the cell content.

**Row and Column Spans**

How to Make a Two-Cells Column or Row?- **colspan="2” or rowspan="2**

**HTML Forms**

The primary method for gathering data from site visitors.HTML Forms can contain-Text fields for the user to type.Buttons for interactions like:"Register", "Login", "Search",Menus, Sliders, etc…

**Types of forms**

Single-line text input fields, Multi-line text input fields (textarea), Password input – a text field which masks the entered text with \* signs, Reset button – brings the form to its initial state, Submit button, Image button – acts like submit but image is displayed and click coordinates are sent, Ordinary button – no default action, used with JS, Checkboxes, Radio buttons-radio buttons can be grouped, allowing only one to be selected from a group, Dropdown menus, Multiple-choice menus, Hidden fields -contain invisible data,

**Labels** -are used to associate an explanatory text to a form field using the field's ID, Clicking on a label focuses its associated field,Checkboxes are toggled,Radio buttons are checked,Labels are,Both a usability and accessibility feature,Required in to pass accessibility validation

**Fieldsets-** are used to enclose a group of related form fields. The <legend> is the fieldset's title

**Sliders and Spinboxes**

Range and Spinbox-Restricts users to enter only numbers. Additional attributes min, max and step and value. Can become Spinbox or Slider, depending on the input type. Have some differences on different browsers. Shown as regular textboxes.

**Field Attributes from HTML 5**

**Autocomplete**-the browser stores the previously typed values.Brings them back on a later visit.**Autofocus**-the field becomes on focus on page load. **Required**-the field is required to be filled/selected.

**Input Fields with Validation**

**Email –** provides a simple validation for email.Can be passed a pattern for validation.In a mobile device brings the email keyboard.**URL** – has validation for url.In a mobile device brings the url keyboard.**Telephone**-Brings the numeric keyboard.

**Tab Index**

The tabindex HTML attribute controls the order in which form fields and hyperlinks are focused when repeatedly pressing the TAB key. tabindex="0" (zero) – "natural" order.If X < Y, then elements with tabindex="X" are iterated before elements with tabindex="Y".Elements with negative tabindex are skipped, however, this is not defined in the standard

**HTML Frames**

Frames provide a way to show multiple HTML documents in a single Web page.The page can be split into separate views (frames) horizontally and vertically.Frames were popular in the early ages of HTML development, but now their usage is rejected.Frames are not supported by all user agents (browsers, search engines, etc.).A <noframes> element is used to provide content for non-compatible agents.

**HTML Markup**

The HTML is used to define the content of a Web page.Not the layout.Not the decorations.HTML's role is to present the information in a meaningful manner.Like a paper document.Define headers, paragraphs, textboxes, etc…Not define size, color and/or positioning.

**CSS Rules**

Cascading Style Sheets (CSS) is the way to make a Web page look pretty.Define styling rules.Fonts, colors, positioning, etc.Define the layout of the elements.Define the presentation.The CSS files are attached to a web page and the browser applies these styles to elements.

**JavaScript Code**

JavaScript is the programming language for the Web.Makes the Web pages dynamic.Dynamically adding / removing.HTML elements, applying styles, etc.Modern JavaScript UI libraries provide UI components like dialog boxes, grids, tabs, etc.Like CSS the JavaScript files are attached to a web page.

**Other Resources**-Other resources are needed for a Web page to run properly.Images, fonts (glyph icons), audio, video files.Flash / Silverlight / ActiveX objects.

**Semantic HTML**

Semantic HTML is:The use of HTML markup to reinforce the semantics of the information in Web pages.Make the content understandable for computers.Rather than merely to define its presentation.A kind of metadata about the HTML content .Semantic HTML is processed by regular Web browsers and other user agents CSS is used to suggest its presentation to human users.Semantic HTML is:Easier to read by developers,parsers, bots, machines, Ais.A way to show the search engines the correct content.

**How to write semantic HTML**: Just follow some guidelines when creating a Web siteUse HTML5 semantic tags <header>, <nav>, <section>, <article>, <aside>, <footer> Use Headings when you need to structure the content into sub-headings.In increasing order, staring with <h1>.Do not use empty tags.Like a clearing <div>.

**HTML5 Structure Tags**

<main>-Specifies the main content of a document ([info](http://html5doctor.com/the-main-element/)).There must not be more than one <main> element in a document.

<header>-Site header or section header or article header, could include navigation (<nav>).

<footer>-Site footer (sometime can be a section footer),providing author, copyright data, etc.

<nav>-Defines a set of navigation links.E.g. site navigation (usually in the header)

<aside>Content slightly related to primary content.E.g. sidebar (usually on the left or on the right)

<section>.Grouping of content usually with a heading, similar to chapters.Site section (e.g. news, comments, links, …)

<article>-Independent content such as blog post or an article (e.g. news item)

<details> + <summary>-Specifies additional details that the user can view or hide on demand (accordion-like widget)

<time>-Specifies date / time (for a post / article / news)

<mark>-Defines marked/highlighted text

<figure>Grouping stand-alone content (video or image).Figure (a figure, e.g. inside an article)

<figcaption>A caption of a figure (inside the <figure> tag)

<video> Video element (uses the built-in player)

<audio> A standard for playing audio files (built-in player)

<dialog>Defines a dialog box or window

<meter> / <progress>Defines a scalar measurement within a known range (a gauge) or task progress

<output>Defines the result of a calculation

<wbr>Defines a possible line-break

**Other Semantics**

Headings-Always use headings (<h1> – <h6>) when you need a heading or title.Like in a MS Word document,Google uses it to mark important content

<strong> marks the text is "*stronger*" than the other, surrounding text

**Accessibility**

Craft content minding disabled users.Blind - include text equivalents of images, use labels in forms.Colorblind - do not convey information using color only.Visually impaired - avoid small font sizes.Epileptic - avoid flashing content (3Hz or more).Physical disabilities - avoid functionality that relies only on the mouse or keyboard.

**Why implement accessibility?**Some accessibility features are mandatory for government sites in some countries (US, NL, SW). “Everyone gets visited by a very important blind user, named Google”.Some SEO and accessibility considerations overlap.

**Search Engine Optimization**

Search engines use so-called “crawlers” to get the content of the page and index it.The crawlers weigh the data on the page <title>, page URL and headings have great weight.Links from highly valued pages to your page increase its value (Google Page Rank).Add alt text to images.Use relevant keywords in the content and <meta> tags.No SEO technique will replace good content.

**Structured Data Markup**

A standard way to annotate your content so machines can understand it.Google (and other search engines) can use that data to index your content better.Present it more prominently in search results.Provide answers from the Knowledge Graph.Three alternative formats:Microdata,RDFa and JSON-LD.

**HTML5 semantic tags**

|  |  |  |  |
| --- | --- | --- | --- |
| <header></header>заглавие | <main></main> | <figure></figure> | <metter></metter> |
| <nav></nav>navigation panel | <article></article> | <figcaption></ figcaption > | <progress></progress> |
| <aside></aside> | <details>  <summary></summary>  </details> | <video></video> | <output></output> |
| <section></section> | <time></time> | <audio></audio> | <wbr></wbr> |
| <footer></footer> | <mark></mark> | <dialog></dialog> | <></> |

**HTML tags**

|  |  |  |  |
| --- | --- | --- | --- |
| <b></b>-bold | <a href=””></a>hyperlink | <ul></ul>unordered list | <th></th>tabular header |
| <i></>italicized | <img src=”” logo=””></>image | <li></li>list item | <thead></thead>table header |
| <u></u>underline | <br/>new line | <dl></dl>definition list | <tbody></tbody>table body |
| <sup></sup>superscript | <h1></h1>up to h6 heading | <dt></dt>definition text | <tfoot></tfoot>table footer comes before <tbody> |
| <sub></sub>subscript | <p></p>paragraph | <dd></dd>definition data | <colgroup></colgroup>defines colums used with <col> |
| <strong></strong> | <div ></div> section tag | table></table> begin/end table | <form></form> |
| <em></em>emphasized | <span></span>section tag | <tr></tr>create a table row | <input type=”text”/>text form |
| <pre></pre>preformated text | <ol></ol>ordered list | <td></td>create tabular data(cell) | <input type=”password”/>pass form |
| <textarea></textarea>multiline text field | <input type=”image” src=”” alt=””/> image buton | <input type=”radion”/>radion buttons | <input type=”hidden”/> hidden fields |
| <input type=”reset”/>reset button | <input type=”button”/>ordinary button | <select><option></option></select> dropdown menu can hold many <option> | <label for=””></label> use input type by ID and can give labeling |
| <input type=”submit”/>submit button | <input type = ”checkbox”/>checkbox | <select multiple=”multiple”> <option></option></select> multiple choice menu can hold many <option> | <fieldset></fieldset> enclose group of fields |
| <input type=”range” min=”0” max=”100”/> slider | <input type=”number” min=”0” max=”100”/> spinbox | <input type=”email” required=”true” patern=””/> email form brings keyboard in mobile | <input type="tel" required="true" /> numeric keybord pops up |
| <frameset cols="180px,\*,150px"> <frame src=””/> </frameset> frame | <iframe name=" " width="" height="" src="" frameborder="" scrolling=""></iframe> another website in the website | <title></title> | <meta><meta/> |