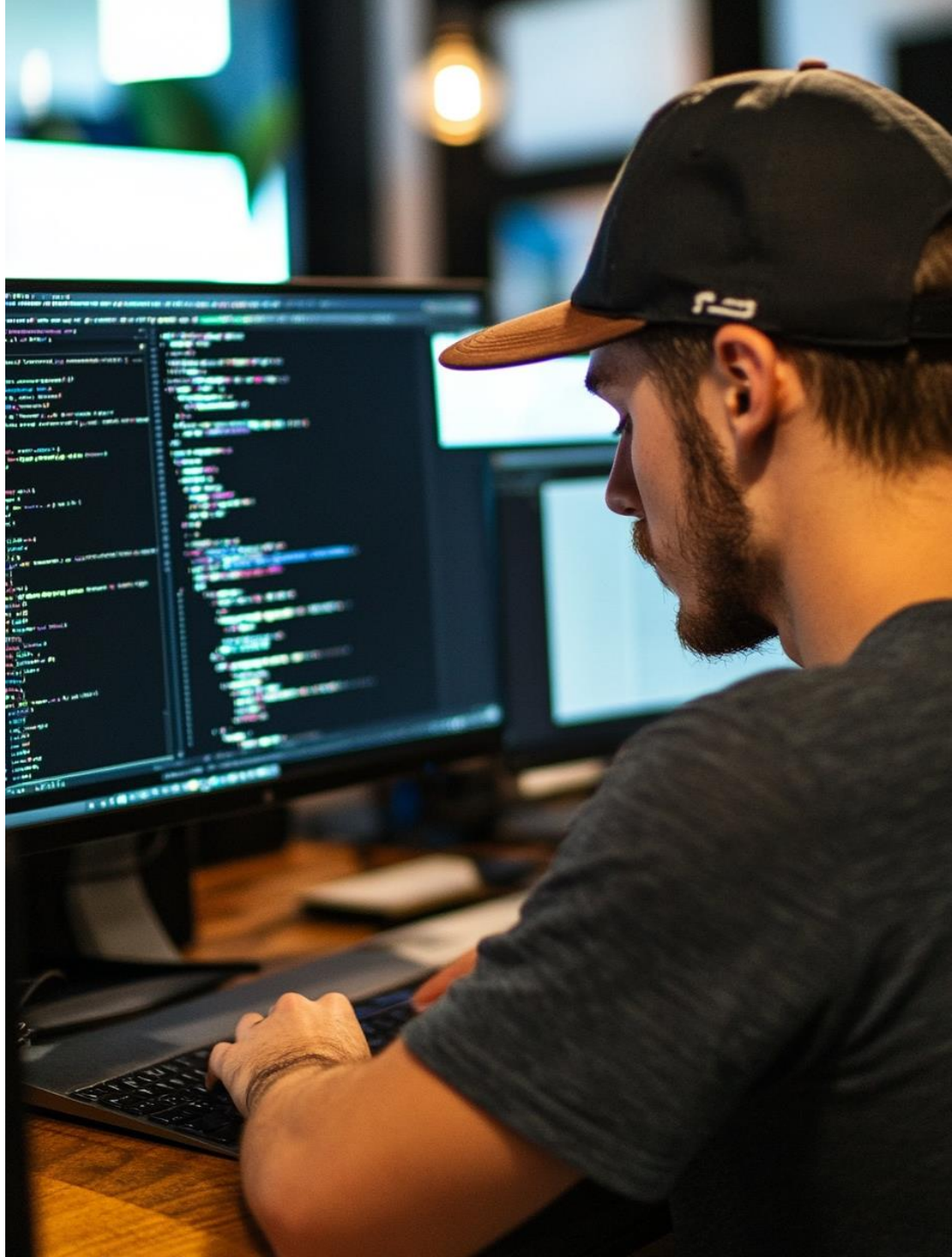
VŠB TECHNICKÁ UNIVERZITA OSTRAVA | FAKULTA ELEKTROTECHNIKY A INFORMATIKY

Development of Internet Applications

HTML and CSS



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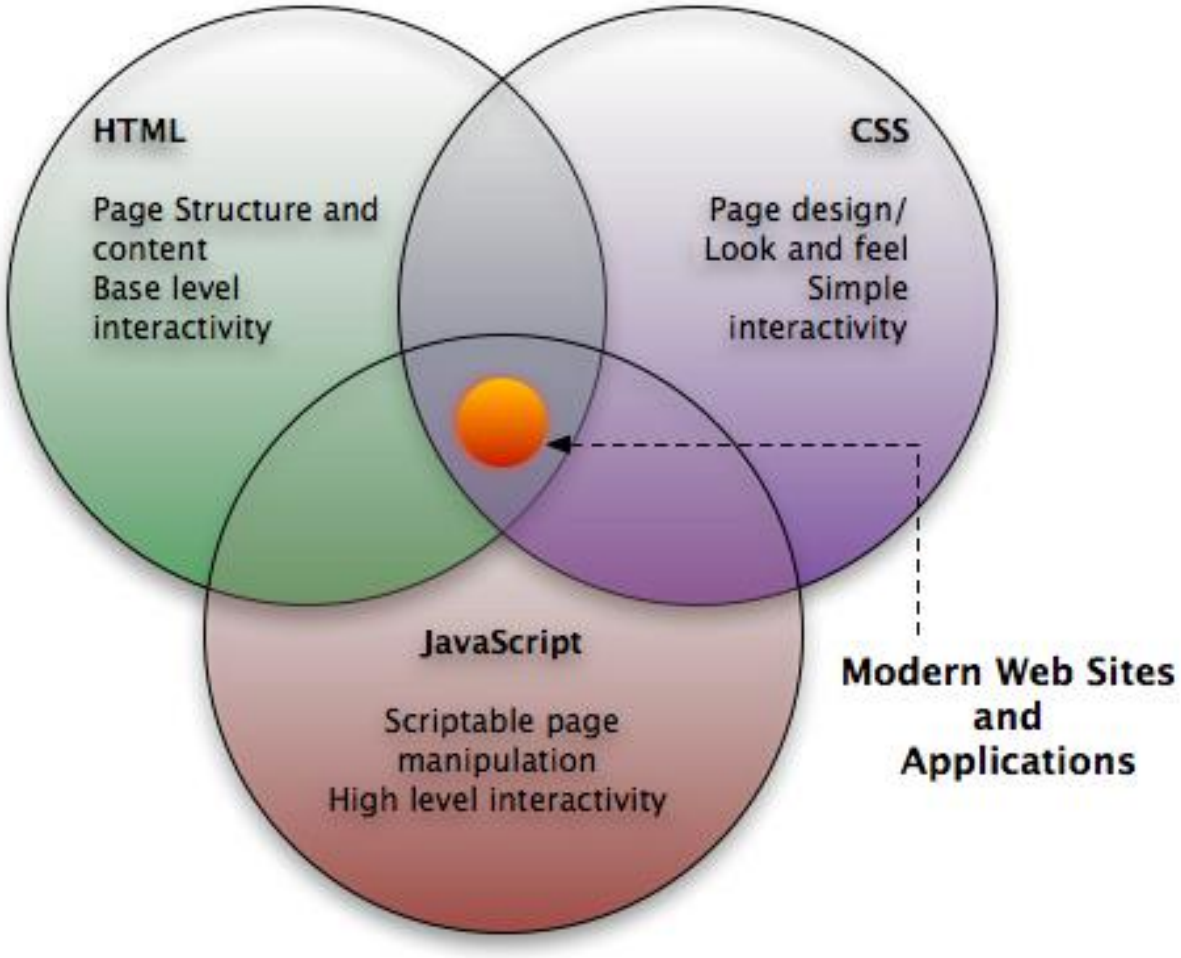
www.cs.vsb.cz/radecky

HTML and CSS

Development of web pages

- Structure
- Content
- Look and feel
- Functionality



zdroj: http://www.99points.info

HTML

HyperText Markup Language

- Markup language for creating of hypertexts – WWW pages
- Based on universal markup language SGML
- Standard W3C.
- Version 4.01 from 1999 was milestone.
- Last version 5.3 – specifications were „finish“ in 2021
- HTML Living Standard – WHATWG (https://whatwg.org)
- Web/HTML pages are text documents
- Desktop/mobile platforms (Universal Windows Apps, PhoneGap, Cordova)

HTML

- It is a markup language for layouting and linking documents. It specifies the structure of information in a document.
- It defines the syntax and placement of elements, with no direct link to their visualization.
- It uses tags (according to SGML)
  - Structural tags (p, h1)
  - Descriptive (semantic) tags (title, address) - increasingly important today
  - Stylistic tags (b, i) - nowadays deprecated with respect to CSS
- Paired and unpaired tags
- Problems are mainly related to different interpretation of content description on different devices/browsers and maintaining backward compatibility

<!-- ... -->

HTML tags

 ...

Open tag

Close tag

 ...

attribute

Value of the attribute

Self closing tag

HTML structure

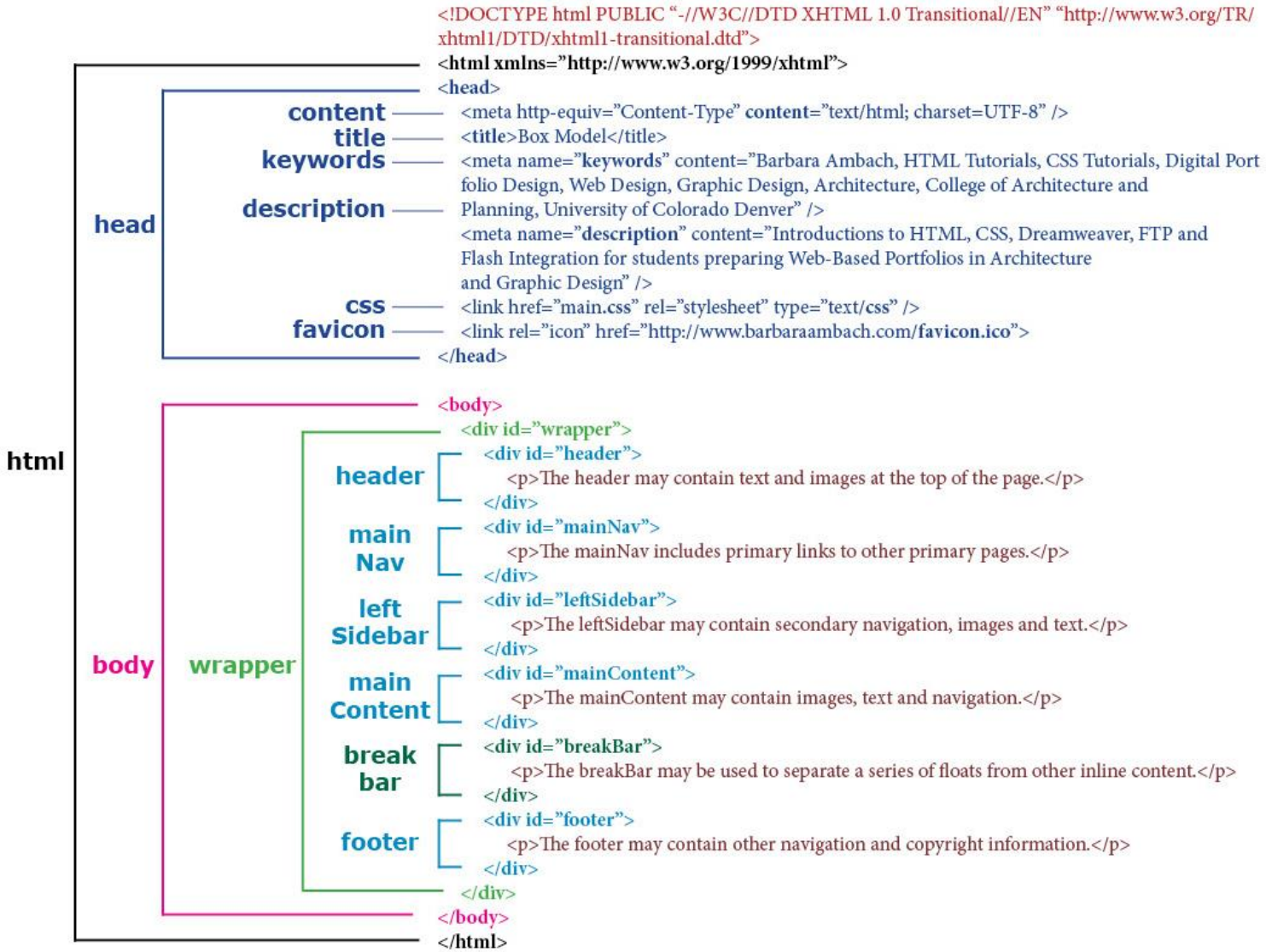
```
<!DOCTYPE html>
<html>
  <!– this is comment -->
  <head>
    <title>Title of the page</title>
  </head>
  <!– body of document -->
  <body>
    <h1>Headline</h1>
    <p>Body of the document</p>
  </body>
</html>
```

Root element of a HTML document

header

body

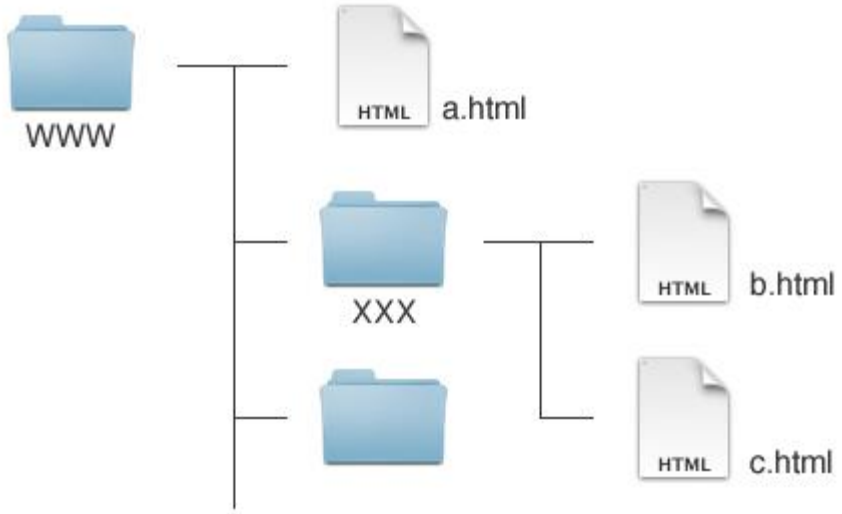
(X)HTML structure



zdroj: http://barbaraambach.com

References in HTML

- References, images, external styles, external JavaScripts, etc.
- Absolute URL – http://, /
- Relative path - ./, ../, a.jpg, images/a.jpg



zdroj: http://www.w3.org

XHTML

Extensible HyperText Markup Language

- HTML closer to XML, more strict requirements to code creation
- Restrictions:
  - Only pair tags
  - All values of parameters need to be quoted
  - No crossing
  - Small caps
  - XML prolog, etc.
- Version (standards W3C):
  - XHTML 1.0 transitional
  - XHTML 1.0 strict
  - XHTML 1.1
  - XHTML 2.0

```
<p>   </p>
<br />
<img src="…" />
```

XHTML

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html
    PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html>
  <!– this is comment  -->
  <head>
    <title>Title of the page</title>
  </head>
  <!– document body -->
  <body>
    <h1>Headline</h1>
    <p>This is body</p>
  </body>
</html>
```

XML prolog

DOCTYPE specification

CSS (Cascading Style Sheets)

Cascading Style Sheets

- An indispensable tool when using (X)HTML today
- Allows you to separate the content and structure (semantics) of a document from its graphical form
- Using the textual notation of various parameters linked to different HTML elements, it is possible to specify their visual (and functional) capabilities.
- Again, significant dependence on specific interpretation by the browser, use of so-called hacks - the situation is already stabilizing
- Possibility of applying different styles to one content, responsive design
- Latest version of CSS3 - individual parts have their own development and specifications

Location of styles

- Location of styles when using
  - In a separate file (import using the style element in the header)
  - In the header of an HTML document
  - Directly in the element (using the style attribute)
- Bindings between style and elements (selectors)
  - By element name
  - By element identifier (id)
  - By element class (class)
  - By structural location in the document (branching and inheritance)
  - Pseudoselectors

CSS rules

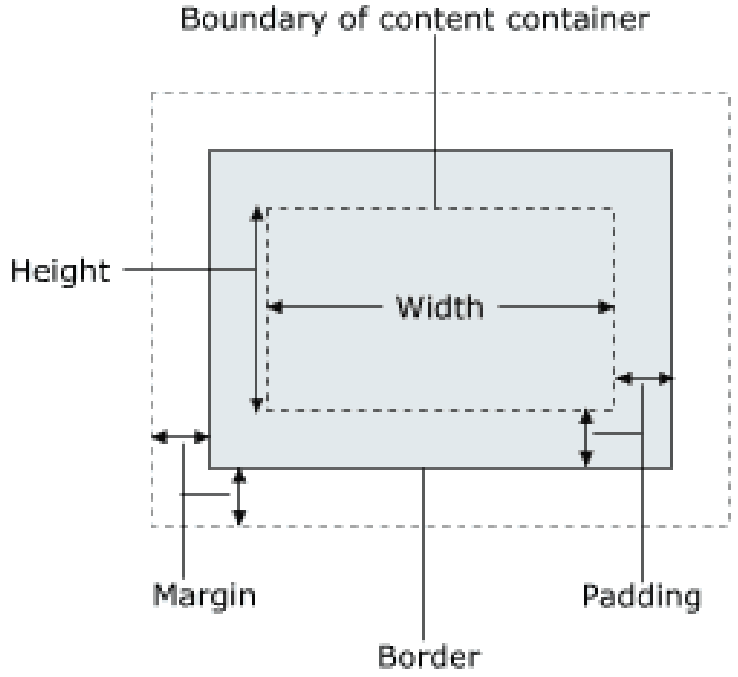

selector
a.link:hover {
color: #ff0000;
}
declaration
property
value

CSS

```
h1 {
        margin: 5px;       /* margin width 5 pixels        */
        font-size: 12pt    /* font size 12 points */
  }
p .odstavec {
        text-align: center;  /* centered text      */
        line-height: 10pt;   /* height of the line 10 points */
  }
#header{}
. without-margin{}
div#menu li a {}
.text a:hover {}
div.text p strong {}
```

CSS and HTML

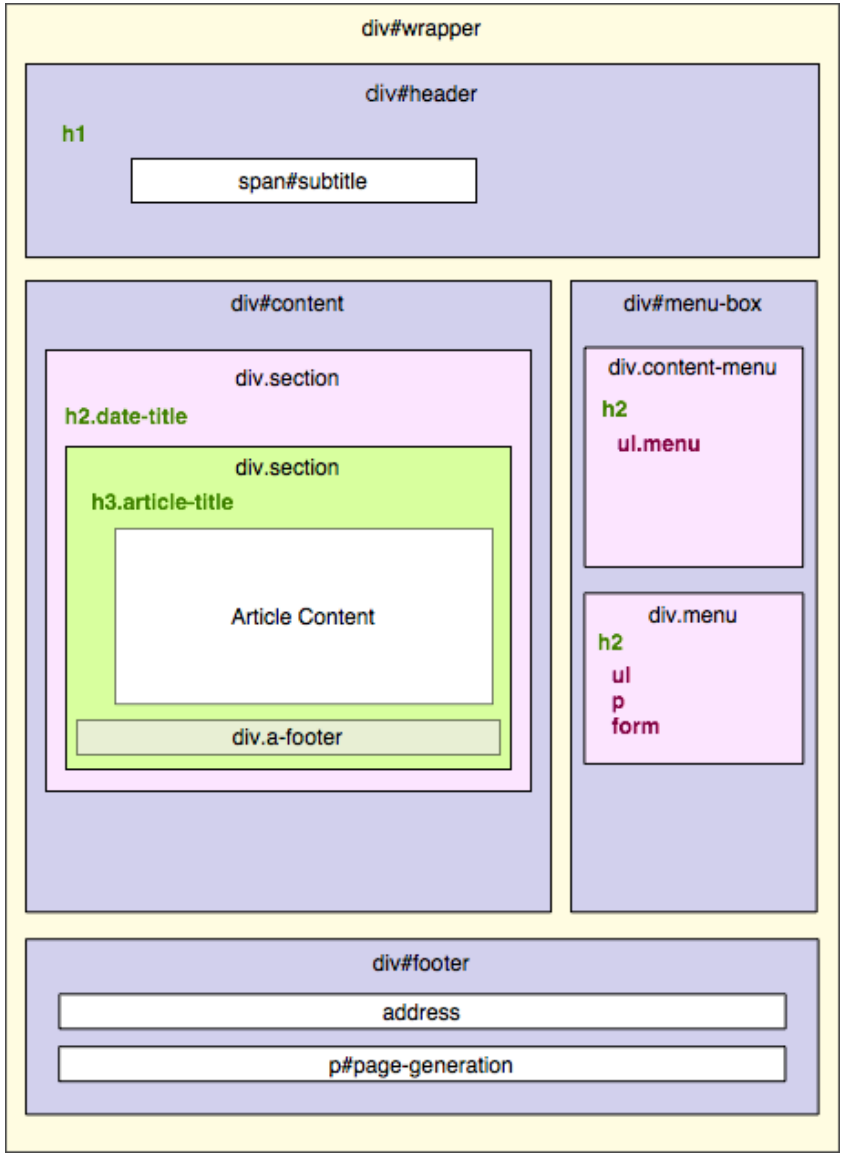
- Block vs. Inline elements
- Values (colors, size, enumerations, functions, references)
- Box model



- Multiple declarations

padding: 1px 2px 5px 10px;

CSS and HTML structure



zdroj: http://basie.exp.sis.pitt.edu/~christomer/css_basics/

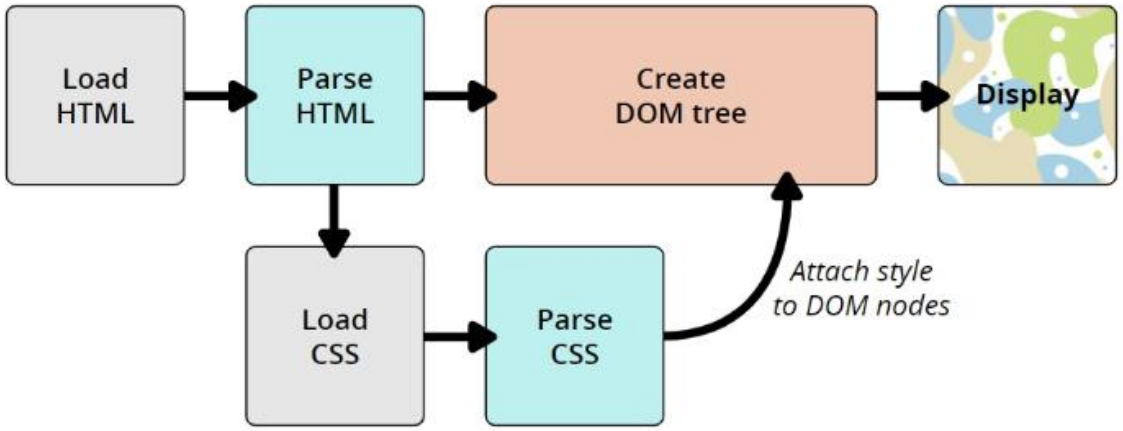
Wireframe, Prototype and Mockup

http://www.slideshare.net/mtreder/wireframing-prototyping-mockuping

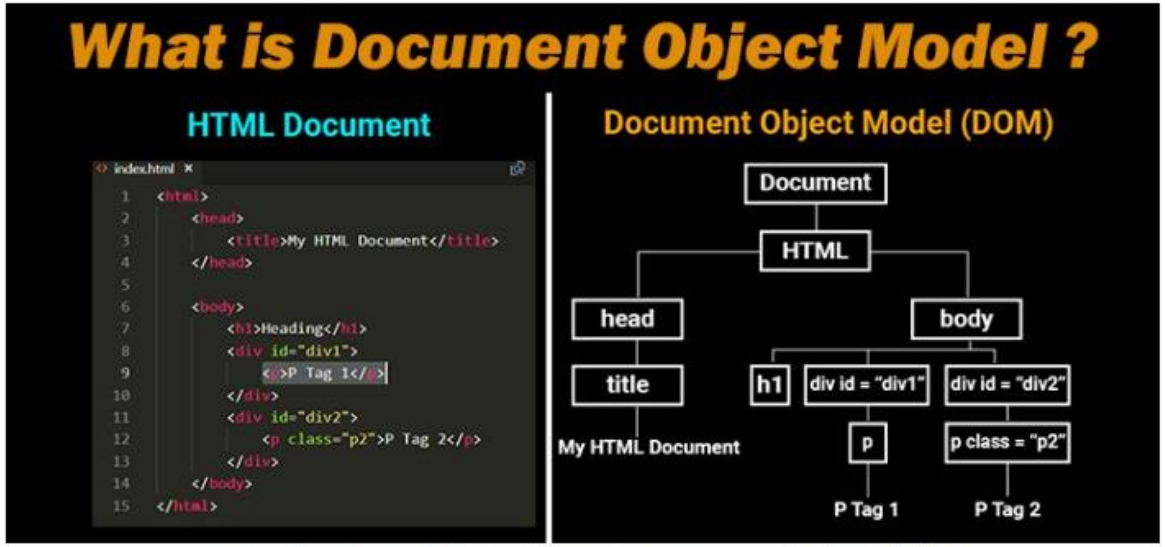
zdroj: http://minimaldesign.net

DOM - Document Object Model

- Cross-platform and language-independent convention for representing and interacting with objects in HTML, XHTML, and XML documents.
- Tree structure built from HTML.
- Accessible using API - node selection, creation, modification and deletion.
- Used by modern browsers for internal representation of web page structure – as a source for direct visualization



How DOM works. Source: Mozilla 2020c.*



HTML document and its equivalent DOM . Source: Sakpal 2018.*

HTML/XHTML

Validation – validation of syntax rules

- http://validator.w3.org/
- https://pagespeed.web.dev/
- Lighthouse

Development

- WYSIWYG
- Direct writing of HTML/XHTML code
- Content management systems