

# Development of Internet Applications

## HTML 5 and CSS3

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# What is HTML5?

- HTML5 is the direction the web is heading – the future of web applications and development
- HTML5 is cross-platform
- HTML5 is not just a marketing brand
- HTML5 is not XML
- HTML5 is not enough for everything
- HTML5 is not final yet and never will be

<https://html.spec.whatwg.org/multipage/>



<http://html5please.com/>, <http://caniuse.com/>

# History HTML5

- 1991 – HTML tags
- 1999 – HTML 4.01
- 2000 – XHTML 1.0 – The Future of the Web
- 2002 – XHTML 2.0
- 2004 – GENERAL GROUP
- Working Group on Web Hypertext Application Technology
- Individuals from Apple, Google, Mozilla, Opera
- 2007 – Principles of HTML design, HTML5 design
- 2009 – W3C discontinues XHTML 2.0 and focuses on HTML5
- 2012 – W3C candidate recommendation
- 2014 – W3C Recommendation – HTML 5.0
- 2016 – W3C Recommendation – HTML 5.1
- HTML Living Standards (WHATWG, W3C)

# What HTML5 offers

- HTML5 = HTML + CSS + JS
- A more direct and simple approach to the site description
- Openness and clear interpretation – rather than input specifications, the output specification is addressed
  - New possibilities
  - User interaction
  - Visualization and multimedia
  - Use of hardware resources
  - Semantic Web
- HTML5 and XHTML
- Closer binding, elements from XHTML, there is still the XHTML 2 specification, but technically it is a finished path

<https://developers.google.com/web/>

<https://experiments.withgoogle.com/chrome>

## Building a better web, together

We want to help you build beautiful, accessible, fast, and secure websites that work cross-browser, and for all of your users. This site is our home for content to help you on that journey, written by members of the Chrome team, and external experts.



[About web.dev](#)

<https://web.dev>

# HTML5 DOCTYPE

## HTML5

- `<!DOCTYPE html>`

## XHTML 1.0 Transitional

- `<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">`

# Script, style and link - attribute type

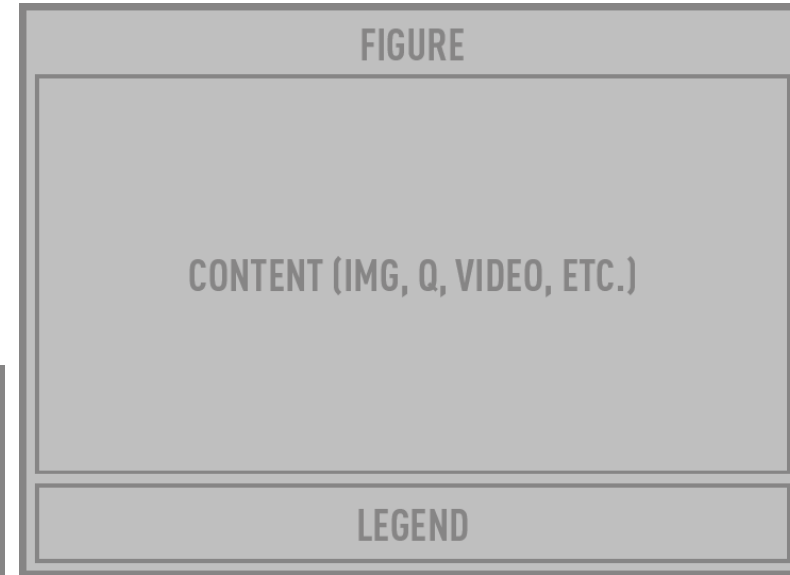
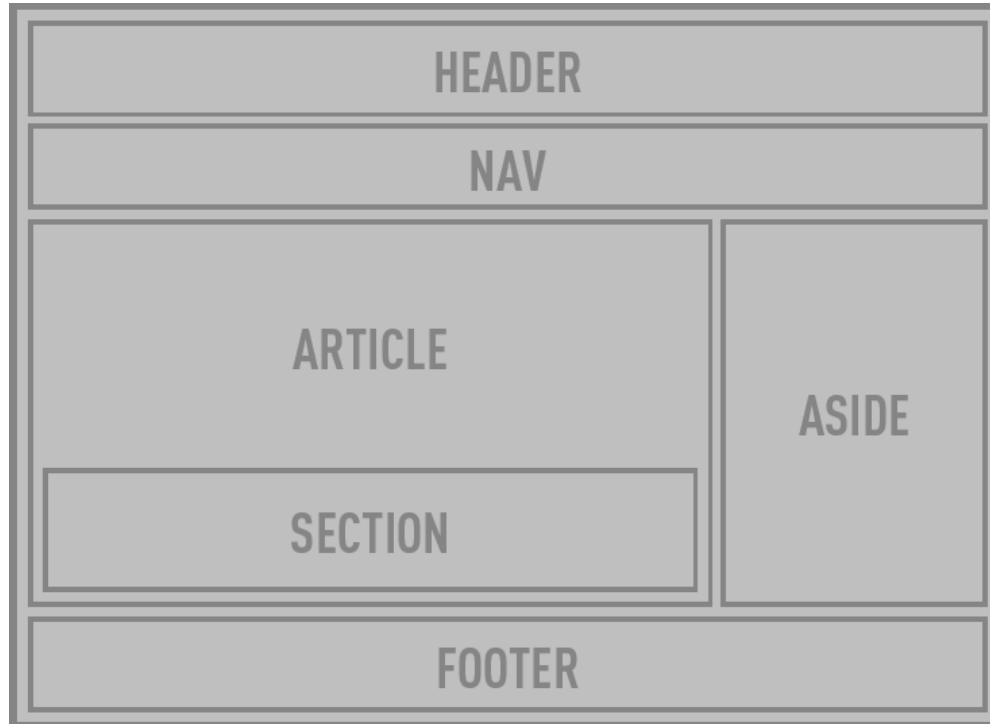
## HTML5

- `<script>`  
// Code here.  
`</script>`

## XHTML 1.0 Transitional

- `<script type="text/javascript">`  
/\*  \*/<br/>// Code here.<br/>/\*  \*/  
`</script>`

# Structural elements





# New elements

- METER
- PROGRESS
- DETAILS & SUMMARY
- TIME
- COMMAND
- DATAGRID
- DATALIST
- OUTPUT
- RUBY
- ADDRESS
- SECTION
- HGROUP
- MENU

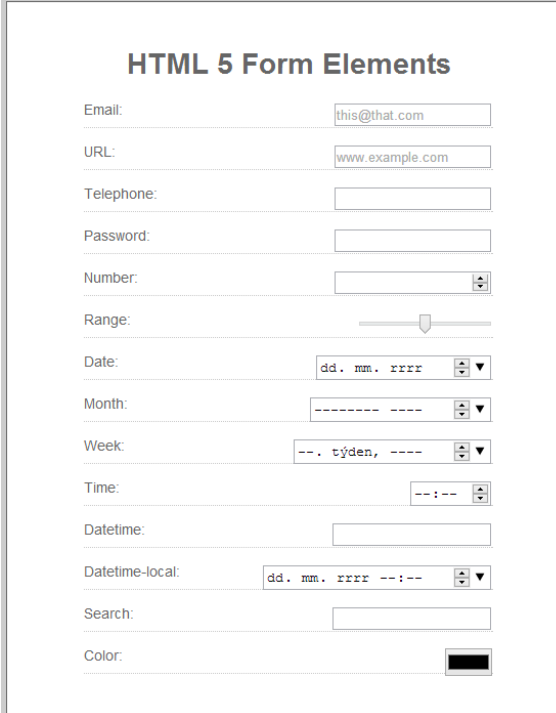
# New form controls

- `<input type="date" />`
- `<input type="datetime" />`
- `<input type="email" />`
- `<input type="month" />`
- `<input type="number" />`
- `<input type="range" />`
- `<input type="tel" />`
- `<input type="time" />`
- `<input type="url" />`

Including integrated validation and input method (e.g. for mobile devices)

Multiple upload

<http://nativeformelements.com/>



The image shows a collection of HTML 5 form elements. At the top, it is titled "HTML 5 Form Elements". Below the title, there are several rows of form controls:

- Email:** A text input field containing "this@that.com".
- URL:** A text input field containing "www.example.com".
- Telephone:** A text input field.
- Password:** A text input field.
- Number:** A text input field with a spinner control on the right.
- Range:** A range slider control.
- Date:** A date picker control showing "dd. mm. yyyy".
- Month:** A month picker control showing "-----".
- Week:** A week picker control showing "--. týden, ----".
- Time:** A time picker control showing "--:--".
- Datetime:** A text input field.
- Datetime-local:** A date and time picker control showing "dd. mm. yyyy --:--".
- Search:** A text input field.
- Color:** A color picker control showing a black color swatch.

# Multimedia

```
<video controls/>  
  <source src="test.mp4" />  
  <source src="test.ogg" />  
</video>
```

- Native browser player
- Format issues
  - H.264/H.265 – IE, Chrome, Safari
  - OGG – Firefox, Opera
  - WebM/VP8 – Google, Mozilla, Adobe
- Similarly for the audio element

# Canvas & SVG

## Canvas

- Drawing canvas
- With Javascript, it is possible to easily draw 2D bitmap graphics
- setTimeout/RequestAnimationFrame performance issue
- 3D is not included, solves e.g. WebGL

## SVG

- Vector image format with XML-based description
- Access similar to a DOM, so everything is modifiable directly

# Microdata and Custom data attributes

## Microdata

- The successor to microformats, the goal is to insert clear semantics into the page
- Itemscope, itemtype, and itemprop attributes
- Linking to dictionaries [www.schema.org](http://www.schema.org)

```
<li itemscope itemtype="http://data-vocabulary.org/Breadcrumb">  
  <a href="http://www.example.com/" itemprop="url">  
    <span itemprop="title">Example.com</span>  
  </a>  
</li>
```

## Data attributes

- You can insert your own attributes correctly anywhere – prefix: **data-**
- Access using dataset variables (dash-style -> camelCase)

# API (JavaScript)

- It is based on ECMAScript 5
- Other versions ECMAScript 6, 7, ... 10(2019), ... (classes, etc.)
- Classes, asynchronous programming, etc.
- Asynchronous script loading
- Possibility to use DataURI – embedded Base64 data instead of source as a link

Problem with standardization and browser-dependent development – what is specified and what is implemented

<https://tc39.github.io/ecma262/>

## API (HTML5)

- Drag and drop – attribute draggable
- Content modification – attribute contenteditable
- GeoLocation
- Offline mode – storage, cache manifest, service worker
- Web Sockets – two-way communication at the HTTP protocol level
- Web Workers – variant of background threads, without access to the DOM, based on messages
- Cross-document communication – messages
- Storage – simple storage and database

<https://html5test.com/>

# CSS3

- Natural HTML5 addition
- Basically, everything can be styled, including video, audio or canvas elements
- Still in development <http://www.w3.org/Style/CSS/current-work>
- Layout options
  - grid, flexbox, responsive design
- Media Queries
  - @media screen and (min-width: 600px) and (max-width: 900px)
- New selectors and pseudoselectors
  - :nth-child(N), :first-of-type



# CSS3

- Colors – opacity, rgba, hsl/a, gradients
- Background – background dimensions, multiple backgrounds
- Borders – border colors, image for the border, round corners, shadows
- Text – text wrap/shortening, shading, column typesetting, custom fonts (otf, eot, ttf)
- Transformations (also in 3D) – rotation, scale, skew, shift
- Transitions and animations