

HTML & CSS: Text documents, forms, formatting and layout

Michał Okulewicz

Emapa Telematics Sp. z o.o.



Speaker introduction

Michał Okulewicz

- Alumni of MiNI Faculty
- Used to work at the faculty (till 2023) and give lectures on Software Engineering and From HTML to PostGIS
- Specializes in Vehicle Routing Problem optimization (with genetic algorithms) - both academically and practically
- Works as research and development manager for Emapa Telematics Sp. z o.o.

Emapa Telematics Sp. z o.o. introduction



What do we do?

- Digital maps and navigation software
- Route and district optimization for logistics and delivery companies

Why I work there?

- Fastest matrix calculation engine for vehicle routing problems (VRP) on the market
- Poland based company, supporting Polish customers with high-end solutions (e.g. Orlen Paczka, Poczta Polska)
- Here Maps did not respond to my CV ;)

Emapa Telematics Sp. z o.o. introduction



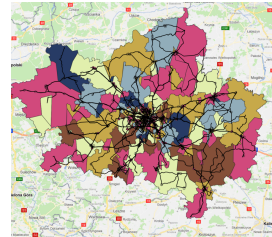
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Emapa Telematics Sp. z o.o. introduction



Lecture plan



Lecture plan

① Motivation for today's lecture

② HTML

- Introduction

- Standard document elements

- Forms and controls

- HTML5 interactive elements

③ CSS

- Introduction

- CSS formatting

- CSS layout

- Clean CSS code

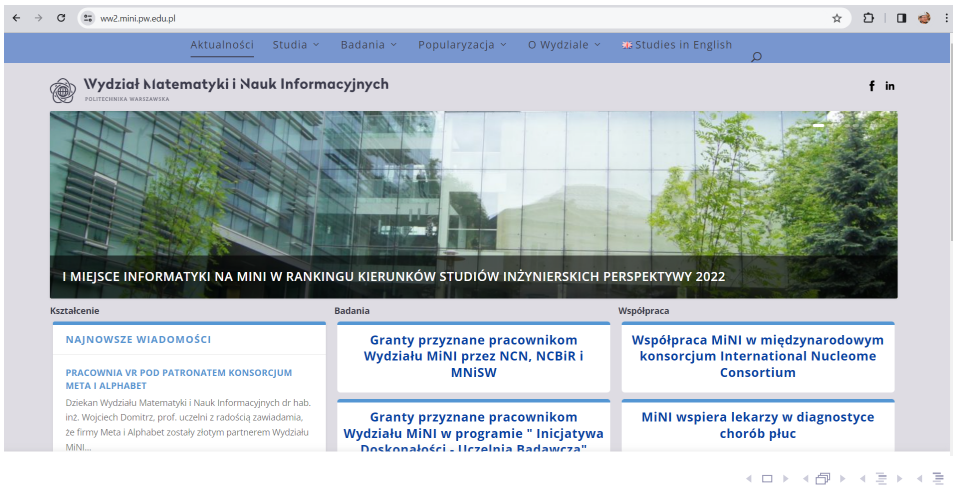
④ More details

Control layout of your website



Source: https://www.freshthing.pl/Kubek-css_is_awesome-P141435

Do not trust the screenshots (well, duh!)



Web applications vs. desktop applications

TECH / 2012 TECH

2012: The Year The Desktop App Died

We've seen the last of the great desktop apps. The end of one of computing's longest eras.



John Herrman
BuzzFeed Staff

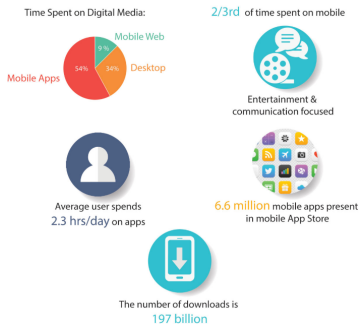
Posted on December 12, 2012, at 10:47 a.m. ET

Source: <https://www.buzzfeednews.com/article/jwherrman/2012-the-year-the-desktop-app-died>

Discussion: <https://www.sitepoint.com/web-desktop-apps/>

2017 status of mobile web applications and their future

MOBILE APP STATS 2017



Source: Future of Mobile App Development 2018
Why Progressive Web Apps Will Replace Native Mobile Apps
Or will they?

Web applications: things worth looking into

- Proper applications like online [Visual Studio Code on github](#)
- **Progressive Web Apps** as one of the ways to develop mobile applications
- **WebAssembly** as an approach to enhance “slow” JavaScript with running compiled binaries
 - [Things that still won't happen in .NET10 Blazor](#)

HTML

- Purpose and structure of HTML
- HTML syntax and its connection to XML
- Block and inline elements
- Functional and visual elements
- Specification and tutorial examples

Empty HTML document

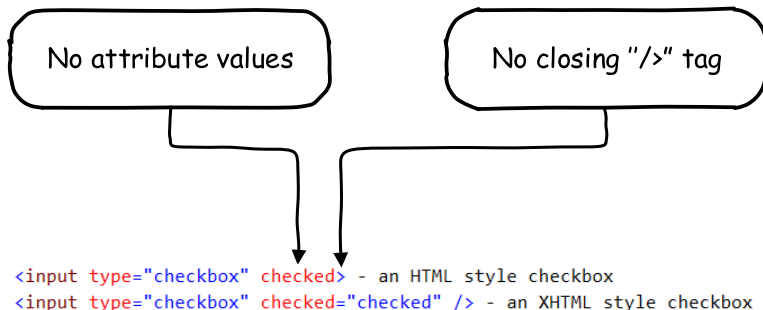
```
<!DOCTYPE html>
<!-- DOCTYPE html declares document to be HTML5 -->
<html>
<head>
  <meta http-equiv="content-type"
        content="text/html; charset=utf-8" />

  <!--
  New syntax for the above declaration:
  <meta charset="utf-8" />
  -->
  <title>Page title</title>
</head>
<body>
  <!-- The contents of the page goes here -->
</body>
</html>
```

Checkout how to
declare older formats

As usual: BEWARE
of older browsers!

HTML vs. XHTML



Comment

HTML 5 is descendant of both HTML 4.0.1 and XHTML 1.1 (aka [Polyglot Markup](#))

Basic text document

Some quotes from “The Lord of the Rings”

Life

It's a dangerous business, Frodo, going out your door. You step onto the road, and if you don't keep your feet, there's no knowing where you might be swept off to.

Afterlife

PIPPIN: I didn't think it would end this way.

GANDALF: End? No, the journey doesn't end here. Death is just another path, one that we all must take. The grey rain-curtain of this world rolls back, and all turns to silver glass, and then you see it.

PIPPIN: What? Gandalf? See what?

GANDALF: White shores, and beyond, a far green country under a swift sunrise.

PIPPIN: Well, that isn't so bad.

GANDALF: No. No, it isn't.

Headers

Paragraphs

(Note to self: `html_examples/headers_paragraphs.html`)

Some content element examples

Element	Function
html	Root of the document structure
head	Metadata of the document and HTTP headers
body	Visible contents of the document
p	Text paragraphs
h1-h6	Various headers
br	New line (break line)
a	Hyperlinks
img	Images

Links and images

a

- relative links:

```
href="../downloads/mlog/01_fake_algorithm_run.zip"
```

```
href="/~okulewicz/downloads/mlog/01_fake_algorithm_run.zip"
```

- absolute links:

```
href="http://www.mini.pw.edu.pl/~okulewicz/downloads/mlog/01_fake_algorithm_run.zip"
```

img

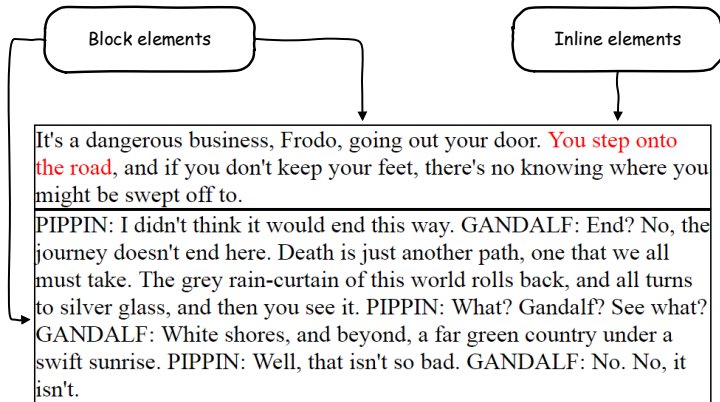
- src - image source
- alt - alternative text (useful for visually impaired, text browsers and search engines) - [further reading](#)

Note: Please check [Web Content Accessibility Guidelines](#) for more information.

Table structure

Element	Function
<code>table</code>	Tables
<code>tbody</code>	Main content of the table
<code>thead</code>	Headers of the table
<code>tfoot</code>	Footer of the table
<code>tr</code>	Row of the table
<code>td</code>	Single data cell of the table
<code>th</code>	Single header cell of the table

Two groups of elements



(Note to self: `html_examples/formatting-no-css.html`)

Contextual elements examples

Element	Function
<code>div</code>	Generic block element
<code>section</code>	Document section
<code>nav</code>	Navigational bar
<code>p</code>	Text paragraph
<code>span</code>	Generic inline element
<code>strong</code>	A marked part of the text
<code>em</code>	An emphasized part of a text
<code>del</code>	A part of the text that has been removed (or obsolete)
<code>small</code>	Side comments

Note (from HTML 5.2 W3C Recommendation, 14 December 2017)

"Authors are strongly encouraged to view the `div` element as an element of last resort, for when no other element is suitable."

Form and controls

- In order to develop web applications (either client-based or full-stack), we need a set of controls to get an input from the user.
- Before HTML5 only the basic ones (text, password, checkbox, lists etc.) has been natively supported by browsers
- HTML5 gave additional support for autocomplete, validation, and more control types

Functional elements

Element	Function
form	Container marking a context for a single data submit operation
input	Text, password, checkbox controls
select	ComboBox and list controls
textarea	Large blocks of texts control
button	Buttons :)

Visual and user experience elements

Element	Function
<code>fieldset</code>	Visually groups controls
<code>legend</code>	Label for a fieldset
<code>label</code>	Label for a single control
	(enlarges active area for clicking and tapping)
<code>datalist</code>	A data list for initial autocomplete

Form example

Bank transfer details

Account number

Recipient

Transfer note

Amount

Transfer date

Transfer type

ELIXIR ☒ SORBNET ☐

Additional details

Buy insurance for the transfer

☐

Confirmation e-mail

Send money nowhere

(Note to self: `html_examples/forms.html`)

HTML5 – more than just new semantic elements

- Audio & video
- Canvas
- Drag & drop operations

Check the asteroids in JS and HTML

Final message

Don't be afraid of **HTML specs**
Checkout **list of tags on w3schools**

Quick check — HTML / Szybkie pytania — HTML

- ❶ Which tag defines the root of an HTML document?
(A) `<body>` (B) `<html>` (C) `<head>`
(PL) Który znacznik jest korzeniem dokumentu?
- ❷ True or False: `<div>` should be the first choice for semantic structure.
(A) True (B) False
(PL) Prawda czy fałsz: `<div>` powinien być pierwszym wyborem dla struktury semantycznej?
- ❸ What attribute provides alternative text for images?
(A) `title` (B) `alt` (C) `src`

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- 2 Which element visually groups form controls?
(A) `<fieldset>` (B) `<form>` (C) `<div>`
(PL) Który element wizualnie grupuje kontrolki formularza?
- 3 How do you mark an input as required in HTML?
(PL) jak oznaczyć pole formularza jako wymagane w HTML?

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CSS

- Purpose of CSS
- CSS basic syntax
- CSS formatting
- CSS layout
- Media queries

Why CSS?

- You can do quite a lot basing on default formatting of various HTML elements
- Lets inspect some of them...
- (Note to self: `html_examples/formatting-no-css.html`)
- But not with interface design and its layout
- (Note to self: `html_examples/formatting.html`)
- Moreover, one should not rely on such a default formatting

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CSS syntax

```
selector {  
  style: value;  
}
```

Selector	Function
element	Selects all: <element>
.className	Selects all: <element class="className">
#identifier	Selects all: <element id="identifier">
:pseudo-class	Selects all with context (e.g. :first-of-type)
[filter=value]	Selects all: <element filter="value">

CSS in text formatting

color foreground content of the selected elements (usually: text, possibly: underline etc.) - named color, #34DE12 or rgb(100,200,123) syntax possible

background complex style including background color and image and its repetitiveness

border complex style including color, width and type of border (e.g. solid, dashed)

font font family (including named and generic: serif, sans-serif, monospace, cursive and fantasy), size, weight and style

text alignment, decorations and transformations

CSS in layout design

position way of setting elements positions (static, relative, absolute, fixed)

display way of rendering elements

float makes an element a floating element (it will be surrounded by other content)

left—top—right—bottom position properties

margin element's margins (starting from top and going clockwise)

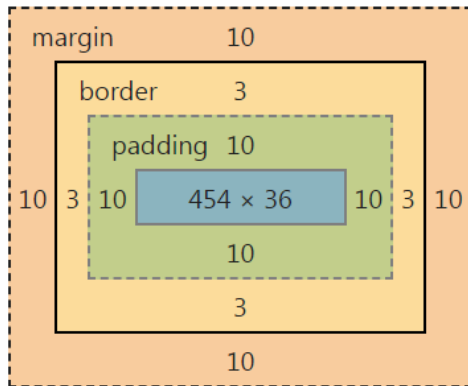
padding element's inner margins (starting from top and going clockwise)

(Note to self: simple layout example `html_examples/div-positioning.html`)

(Note to self: larger layout example `html_examples/ip_3_css.html`)

(Note to self: newer layout example `html_examples/grid-layout-example/layout-css.html`)

Box model



Grid model: html_examples/forms-grid.html

Bank transfer details

Account number

Recipient

Transfer note

Amount

Transfer date

100

rrrr-mm-dd

Send money nowhere

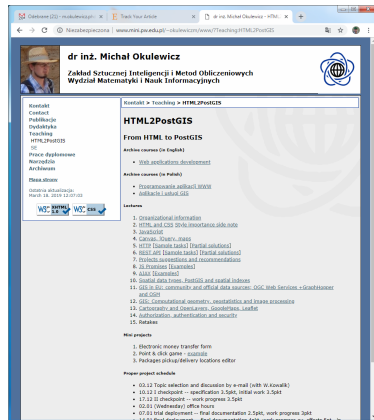
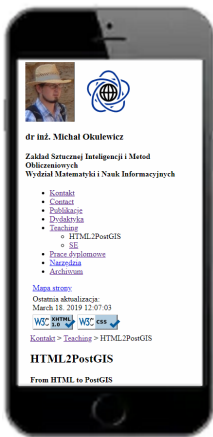
```
.grid-container {  
  display: grid;  
  grid-template-columns: 200px auto;  
}
```

```
<div class="grid-container">  
  <div><label for="number" class="label-text">Account number</  
  <div><input id="number" class="input-transfer-data" name="nu  
  <div><label for="recipient" class="label-text">Recipient</la  
  <div><input id="recipient" class="input-transfer-data" name=  
  <div><label for="note" class="label-text">Transfer note</lab
```

Media queries and Responsive Web Design

- How to create web interfaces simultaneously supporting:
 - standard browsers (on +15" screens)?
 - mobile devices (with 7" – 11" screens)?
 - smartphones (with 4" – 6" touchscreens)?

Media queries and Responsive Web Design



Small device query example

```
@media (max-device-width: 640px) {  
  body {  
    background: white;  
  }  
  div {  
    border: 0px solid #003399;  
    position: static;  
    background: #ffffff;  
    margin: 5px;  
    color: #000000;  
    width: 90%;  
  }  
}
```

Beware: A pixel is not a pixel

Clean code

- CSS preprocessors: LESS, SASS
- Flat structure vs deep structure
 - [Block Element Modifier](#)
 - Utilities (.u- prefix)
 - JS Hooks (.js- prefix)

Quick check — CSS Responsive / CSS i RWD

- ① Which property controls space outside the element box?
(PL) Która właściwość kontroluje rozmiar przestrzeni na zewnątrz elementu?
(A) margin (B) padding (C) border
- ② What CSS @-rule is used to change rules at specific viewport widths?
(PL) Która @-reguła CSS jest używana do zmiany stylów przy określonych szerokościach widoku?
(A) @media (B) @viewport (C) @container
- ③ Name two CSS layout models.
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Summary



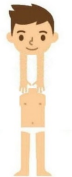
HTML



JavaScript



CSS



MOBILECSS

Hubert Baniecki

Check out my [introduction to web development tutorial!](#)

A word from Emapa Telematics Sp. z o.o.



You can find me on LinkedIn to get more details:
<https://www.linkedin.com/in/michalokulewicz/>



We are looking for interns in the following areas / technology stacks:

- Optimization algorithms specialist (Vehicle Routing Problem, genetic algorithms)
- GIS engineer (leaflet, QGIS, OpenLayers, GeoJSON)
- Data engineer (Python, SQL, PostGIS, Excel, .NET)
- Full stack developer

legacy .NET Framework 4.6, Sencha ExtJs

current .NET 8.0/9.0/10, vue.js, Docker, Azure DevOps pipelines

Please take a quick survey and let's keep in touch!



Proszę wypełnij ankietę i pozostańmy w kontakcie!

