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

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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

Web appliactions 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.
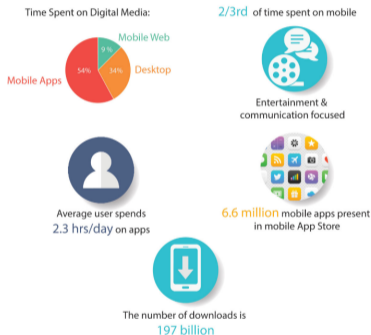
John Herrman
BuzzFeed Staff

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

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 possible future trend
- **WebAssembly** as an approach to replace "slow" JavaScript as the only programming language within the browser

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Introduction
Standard document elements
Forms and controls
HTML5 interactive elements

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

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Empty HTML document

```html
<!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!

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HTML vs. XHTML

No attribute values

No closing "/>" tag

```
<input type="checkbox" checked> - an HTML style checkbox
<input type="checkbox" checked="checked" /> - an XHTML style checkbox
```

Comment

HTML 5 is descendant of both HTML 4.0.1 and XHTML 1.1

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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`)

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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

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Links and images

a

- relative links:

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

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

- absolute links:

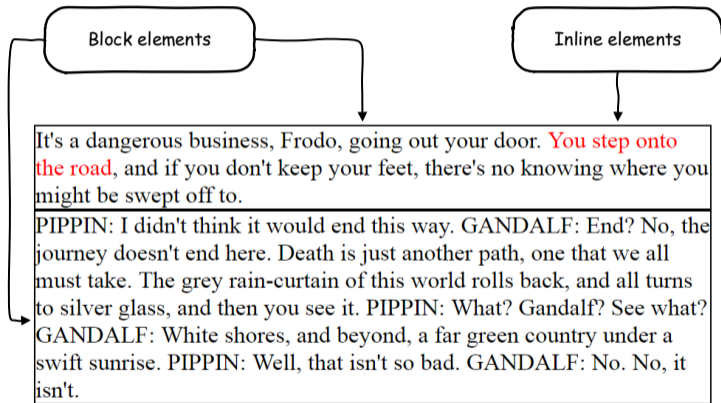 `href="http://www.mini.pw.edu.pl/~okulewiczm/downloads/mlog/01_fake_algorithm_run.zip"`

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.

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Table structure

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

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Two groups of elements

Block elements

Inline elements

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.

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.

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

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Contextual elements examples

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

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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 autocompletion, validation, and more control types

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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 :)

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Visual and user experience elements

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

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Form example

Bank transfer details

Account number [   ]

Recipient [   ]

Transfer note [   ]

Amount [100   ]

Transfer date [rrrr-mm-dd   ]

Transfer type ELIXIR ⦿ SORBNET ○

Additional details

Buy insurance for the transfer ☐

Confirmation e-mail [   ]

[Send money nowhere]

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

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HTML5 – more than just new semantic elements

- Audio & video
- Canvas
- Drag & drop operations

Check the asteroids in JS and HTML

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Final message

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

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Introduction
CSS formatting
CSS layout
Clean CSS code

CSS

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

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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">

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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

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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`)

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Box model

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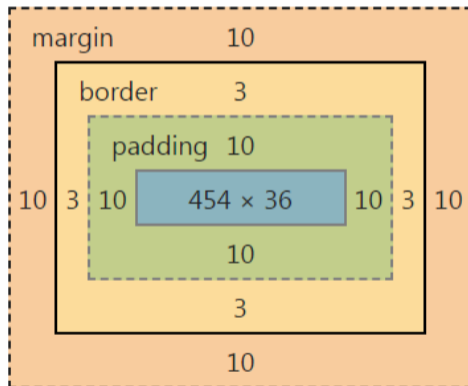
Grid model: html_examples/forms-grid.html

Bank transfer details

Account number
Recipient
Transfer note

Amount   100
Transfer date   rrrr-mm-dd

Send money nowhere

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

```html
<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
```

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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)?

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Media queries and Responsive Web Design

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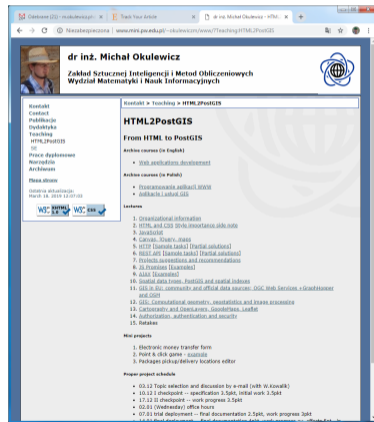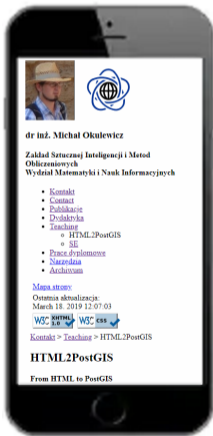
Small device query example

```css
@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

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Clean code

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

Summary

Check my introduction to web development tutorial!

Example of a pointed HTML & CSS task (1)

- General:
  - 3p. For an (almost) complete solution valid with HTML5 and CSS 3 standards
- General layout:
  - 1p. Create a three column display with each of the columns taking 30
  - 1p. Paragraphs start at the same level as the caption of the form
  - 1p. Paragraphs have a 1em sized side margins
  - 1p. Title bar displays a provided icon and "Thursday 10:15 a.m." text
- General layout for browser width less than or equal 1080px:
  - 2p. The display switches to single column, with the form coming first
  - 1p. The form is centered and has a 20em width

Example of a pointed HTML & CSS task (2)

- Text content:
  - 1p. Justify the text in all the columns.
  - 1p. The right and left columns present 5 paragraphs of text (e.g. from lipsum.com).
- Registration form features:
  - 1p. Only alphanumeric characters allowed in login
  - 1p. Passwords at least 8 signs long
  - 1p. All fields are set with an initial text: "Only alphanumeric characters", "Please enter e-mail", "At least 8 characters"
  - 1p. Login and passwords are required fields

Example of a pointed HTML & CSS task (3)

- Registration form display:
  - 1p. Registration form with proper types of input fields and usage of labels
  - 1p. Form has a rounded border
  - 1p. Fields are separated by a 0.5em distance
  - 1p. Pink background of an invalid input and green background of a valid input
  - 1p. Required field has a red border
  - 1p. Input takes 50
  - 1p. Labels are aligned to the right with 1em distance between them and the inputs
  - 1p. Buttons are centered
  - 1p. Every second input entry has a blue background

(Note to self: solution `html_examples/ip_lab_4_task_and_solution/index.html`)

Example of a pointed HTML & CSS task (large viewscreen)

Example of a pointed HTML & CSS task (small viewscreen)