

Web Development

BSc Applied Computing / Forensics / Entertainment Systems/ IOT

Produced
by

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Waterford Institute of Technology

<http://www.wit.ie>

<http://elearning.wit.ie>



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Agenda

- The Module
- The Internet
- The Web
- The Labs

Agenda

- The Module

- The Internet

- The Web

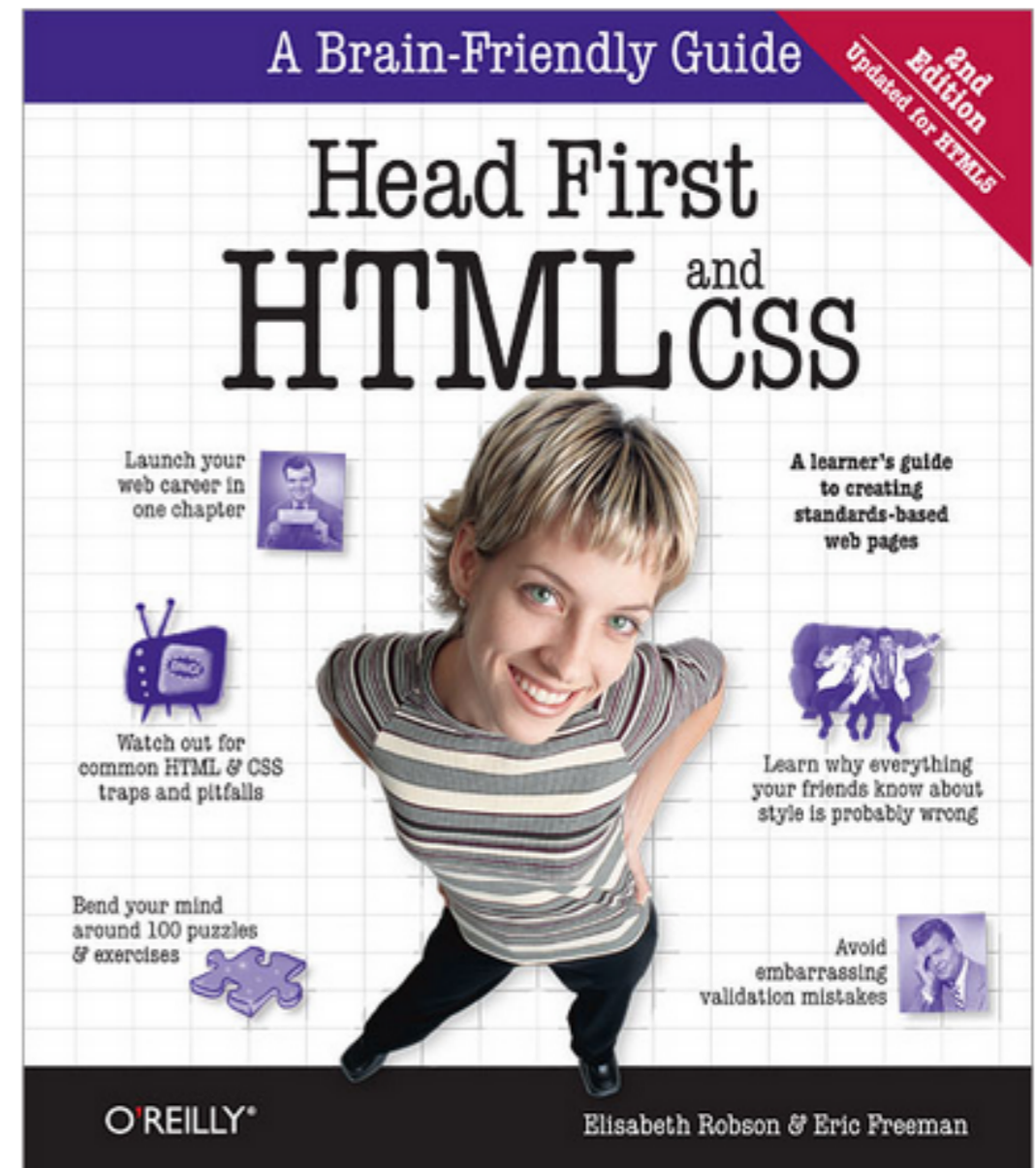
- The Labs

Web Development

- Tuition Team:
 - Eamonn de Leastar (edelestar@tssg.org)
 - Dr. Brenda Mullally (bmullally@wit.ie)
- 12 Week Module
 - 2 Lecture
 - +1 x 2 hour supervised lab
 - 100% Continuous assessment
 - 2 Assignments during term.

Recommended Text

- Head First HTML and CSS, 2nd Edition. By Freeman, Elisabeth and Eric Freeman. 2012.
[Head First HTML with CSS & XHTML](#). O'Reilly & Associates. 658 p.
ISBN 978-0-596-15990-0
- £17 on amazon (new)



Head First Programming

By David Griffiths, Paul Barry
November 2009
Print: \$49.99
Ebook: \$39.99
Bundle: \$54.99

If you have little or no programming experience started with the core concepts of writing computer programs -- functions, and objects --... [Read more.](#)

Head First 2D Geometry

By Lindsey Fallow, Dawn Griffiths
November 2009
Print: \$19.99
Ebook: \$15.99
Bundle: \$21.99

Having trouble with geometry? Do Pi, the Pytha calculations just make your head spin? Relax. With Head First 2D everything from triangles, quads, and... [Read more.](#)

Head First iPhone Development

By Dan Pilone, Tracey Pilone
October 2009
Print: \$44.99
Ebook: \$35.99
Bundle: \$49.49

Let's say you have an idea for a killer iPhone app. Head First iPhone Development will help you get your first application... [Read more.](#)

Head First PMP, Second Edition

By Jennifer Greene, Andrew Stellman
July 2009
Print: \$69.99
Ebook: \$55.99
Bundle: \$76.99

Learn the latest principles and certification objectives. Fourth Edition, in a unique and inspiring way with Head First PMP book helps... [Read more.](#)

Head First Data Analysis

By Michael Milton
July 2009
Print: \$49.99
Ebook: \$39.99
Bundle: \$54.99

How can you learn to manage and analyze all kinds of data? Head First Data Analysis, where you'll learn how to collect and organize data... [Read more.](#)

Head First Networking

By Al Anderson, Ryan Benedetti
May 2009
Print: \$54.99
Ebook: \$43.99
Bundle: \$60.49

Frustrated with networking books so chock full of acronyms that your brain goes into sleep mode? Head First Networking's unique, visually rich format provides a task-based approach to computer networking... [Read more.](#)

Head First Labs from O'Reilly

http://www.headfirstlabs.com/index.php

O'REILLY Brain-Friendly Guides from O'Reilly Media, Inc.

Head First Labs

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New Year, Lots of New Books (and an iPhone app)!

Are you sitting down? Hopefully you are, because we've got a lot to discuss here. Since the last time we posted, we've released four more new books, and an iPhone app to boot. Speaking of iPhone apps, let's start with one of the more recent books we just published...

Head First iPhone Development

In true Head First fashion, you'll be building an app right out of the gate in the first chapter of [Head First iPhone Development](#). Obviously, if you want to build iPhone apps, you want to sell them in the app store, so the book is geared towards getting you creating apps quickly, and also focuses on designing top-notch apps and how to navigate the app submission process. Back in November, co-author Dan Pilone taught a great workshop, [Build, Compile, and Run Your iPhone App in 2 days](#), which covered a lot of the material in the book, namely, getting a developer who knows how to code in an Object Oriented environment coding on a Mac in Objective-C. And Tracey Pilone (co-pilot of the most prolific Head First writing couple since Kathy and Bert!) also recently posted over on the O'Reilly Community blog about [her experience as a Head First author](#), which is a great read for any aspiring Head First authors. (You can follow them both on Twitter as @danpilone and @traceypilone.)

Head First Programming

Completely new to programming? Based on experience with Head First's successful books on programming languages, design patterns, and technologies, learners have long been clamoring for a general Head First introduction to programming for the absolute beginner. In November, Paul Barry and Head First veteran David Griffiths teamed up to finally fill that need with [Head First Programming](#). Of course, this being Head First, you can forget "Hello, World!" and pages upon pages of dull, dry, boring text you'll never apply to real-world problems. By the time you've worked through the first few chapters of this book, you'll have written a numeric guessing game and interfaced with Twitter's API. And by the end of the book, you'll have a completely functional and attractive graphical desktop application! Though the authors use the dynamic and versatile Python language to apply and reinforce the general programming concepts illustrated in concrete examples and exercises, you'll be able to apply this knowledge to whatever language or software project you need or want to learn.

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Looking for **source files, code, exercise answers, and other materials** to go along with your Head First book? Go to [this page](#), find your book on the list, and click on the title.

The Latest Head First Tweets!

Head First (Excel and Data Analysis) author @michaelmilton's Google Apps for Business course starts today! <http://oreil.ly/9X4IIa> 2 days ago

RT @mikehatora: Potential free book: 2 Question Survey-Mobile Platform for development, & why? <http://bit.ly/aQwnid> 7 days ago

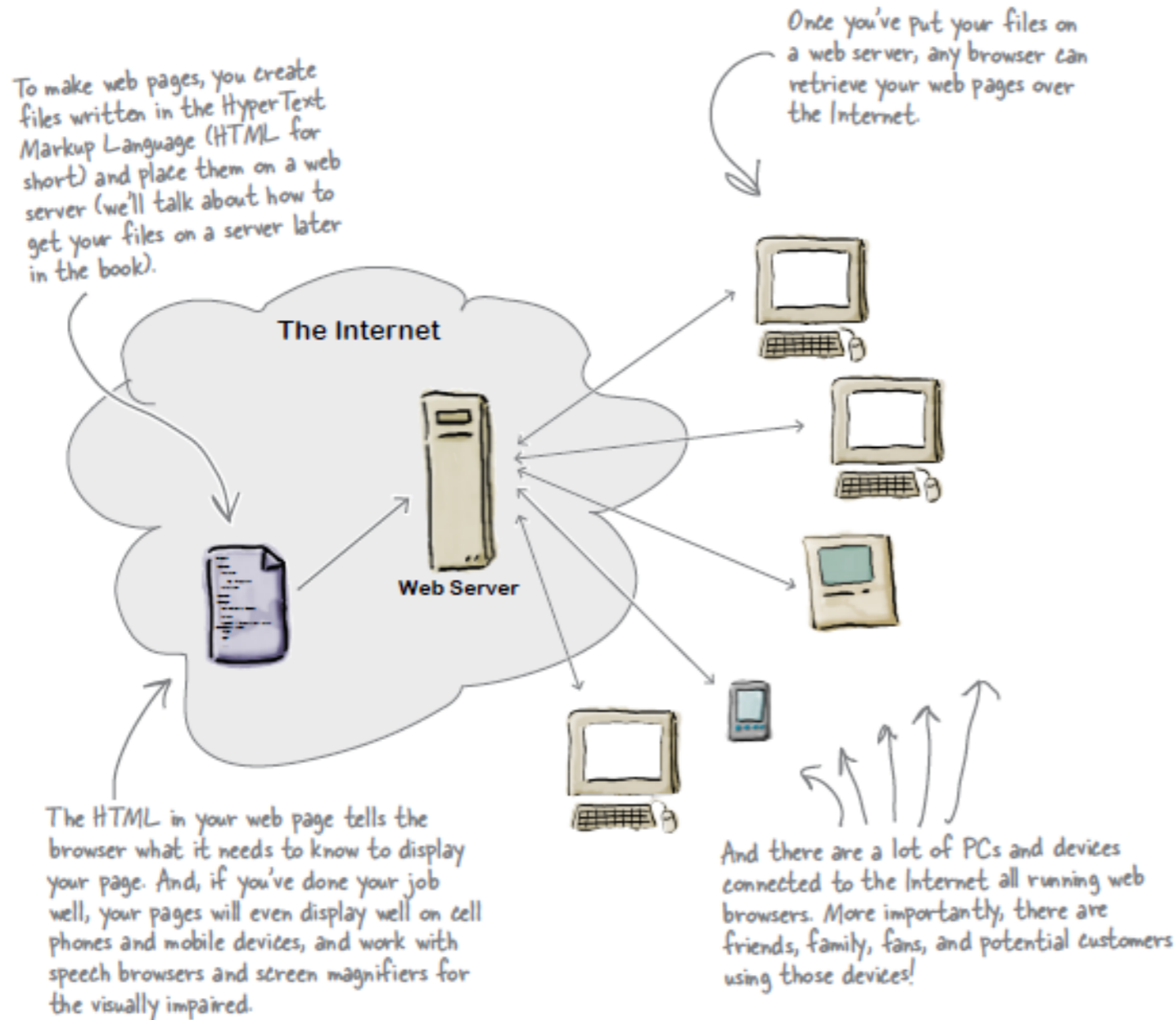
Follow Head First Labs on Twitter!

The Web

Video killed the radio star

Want to get an idea out there? Sell something? Just need a creative outlet? Turn to the Web—we don't need to tell you it has become the universal form of communication. Even better, it's a form of communication **YOU** can participate in.

But if you really want to use the Web effectively, you've got to know a few things about **HTML**—not to mention, a few things about how the Web works too. Let's take a look from 30,000 feet:



What you write (the HTML)

So, you know HTML is the key to getting a browser to display your pages, but what exactly does HTML look like? And what does it do?

Let's have a look at a little HTML... imagine you're going to create a web page to advertise the *Head First Lounge*, a local hangout with some good tunes, refreshing elixirs, and wireless access. Here's what you'd write in HTML:

```
<html>
  <head>
    <title>Head First Lounge</title> (A)
  </head>
  <body>
    <h1>Welcome to the Head First Lounge</h1> (B)
     (C)
    <p>
      (D) Join us any evening for refreshing elixirs,
      conversation and maybe a game or
      two of <em>Dance Dance Revolution</em>. (E)
      Wireless access is always provided;
      BYOWS (Bring your own web server).
    </p>
    <h2>Directions</h2> (F)
    <p>
      (G) You'll find us right in the center of
      downtown Webville. Come join us!
    </p>
  </body>
</html>
```



We don't expect you to know HTML yet.

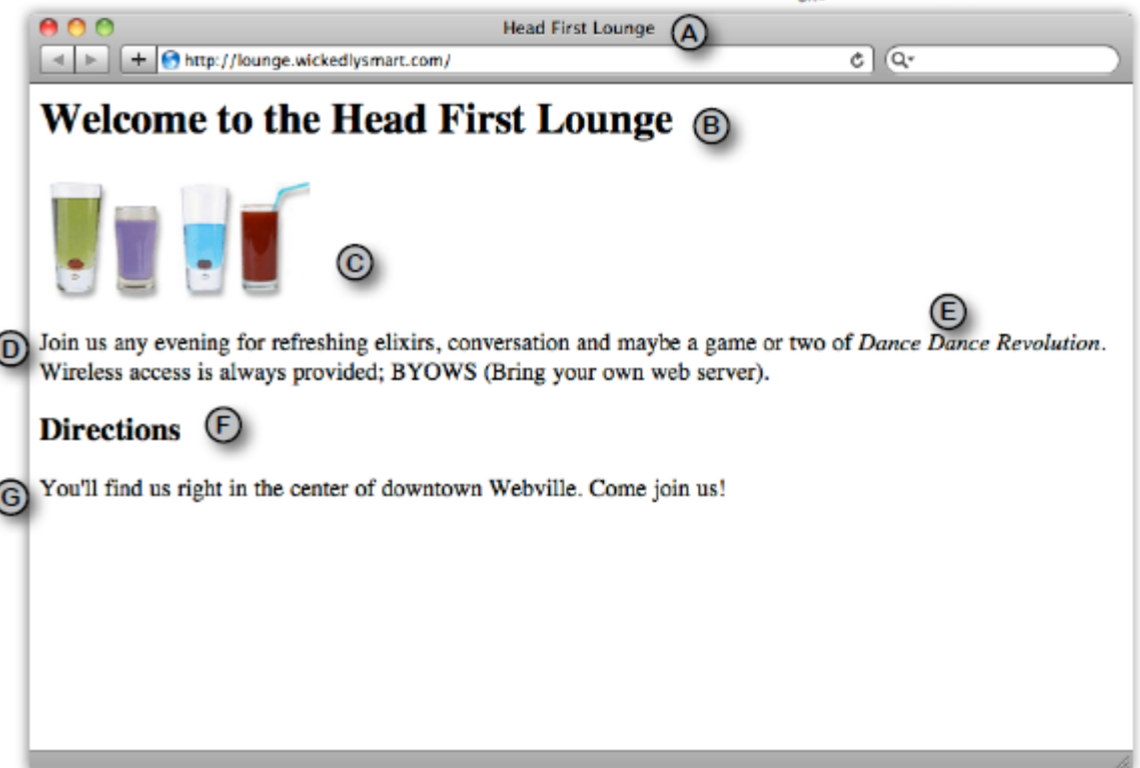
At this point you should just be getting a feel for what HTML looks like; we're going to cover everything in detail in a bit. For now, study the HTML and see how it gets represented in the browser on the next page. Be sure to pay careful attention to each letter annotation and how and where it is displayed in the browser.

What the browser creates

When the browser reads your HTML, it interprets all the *tags* that surround your text. Tags are just words or characters in angle brackets, like `<head>`, `<p>`, `<h1>`, and so on. The tags tell the browser about the *structure and meaning* of your text. So rather than just giving the browser a bunch of text, with HTML you can use tags to tell the browser what text is in a heading, what text is a paragraph, what text needs to be emphasized, or even where images need to be placed.

Let's check out how the browser interprets the tags in the Head First Lounge:

Notice how each tag in the HTML maps to what the browser displays.



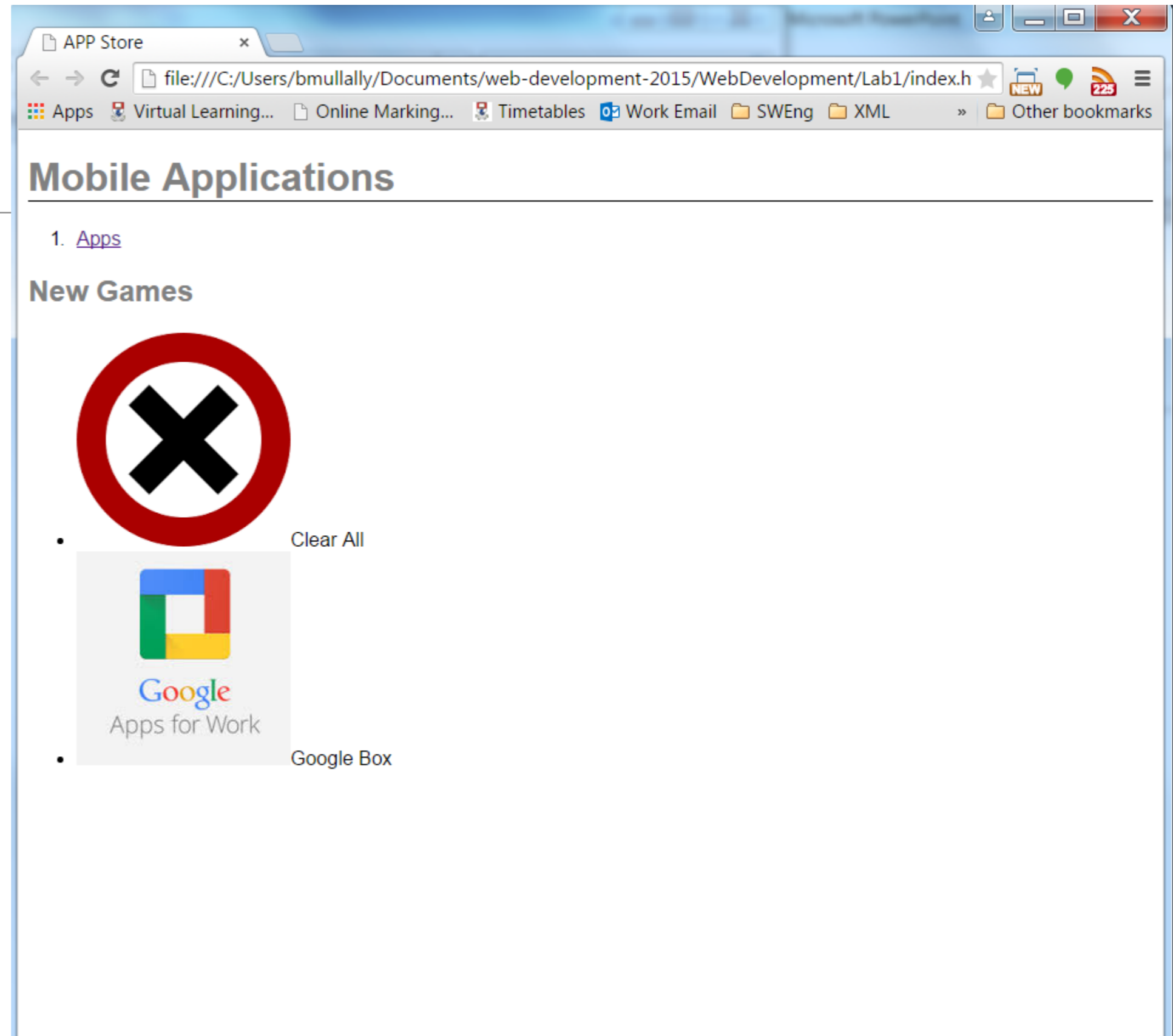
Topics in Web Development

- The language of the Web:
 - Hypertext Markup Language - HTML
 - Cascading Style Sheets - CSS
- ... by building over successive labs a simple web site from scratch.
- Focus on the structure and meaning of:

• **CODE - *html, css***

Lab 01

files
documents
folders
directories
media
content



- A document rendered (displayed) in a browser

```
Untitled - Notepad
File Edit Format View Help
<!DOCTYPE HTML><html> <head>
  <title>APP Store</title><link type="text/css" rel="stylesheet" href="style.css" media="screen" />
</head>
<body><h1>Mobile Applications</h1><ol><li><a href="apps.html">Apps</a></li></ol>
  <h2>New Games</h2><ul><li>Clear All</li>
  <li>Google Box</li></ul>
</body>
</html>
```

- The actual document text - but poorly structured (indented)

```
index.html x
1  <!DOCTYPE HTML>
2  <html>
3      <head>
4          <title>APP Store</title>
5          <link type="text/css" rel="stylesheet" href="style.css" media="screen" />
6      </head>
7      <body>
8          <h1>Mobile Applications</h1>
9          <ol>
10             <li><a href="apps.html">Apps</a></li>
11         </ol>
12         <h2>New Games</h2>
13         <ul>
14             <li>Clear All</li>
15             <li>Google Box</li>
16         </ul>
17     </body>
18 </html>
```

- Exactly the same document - pleasingly indented

Agenda

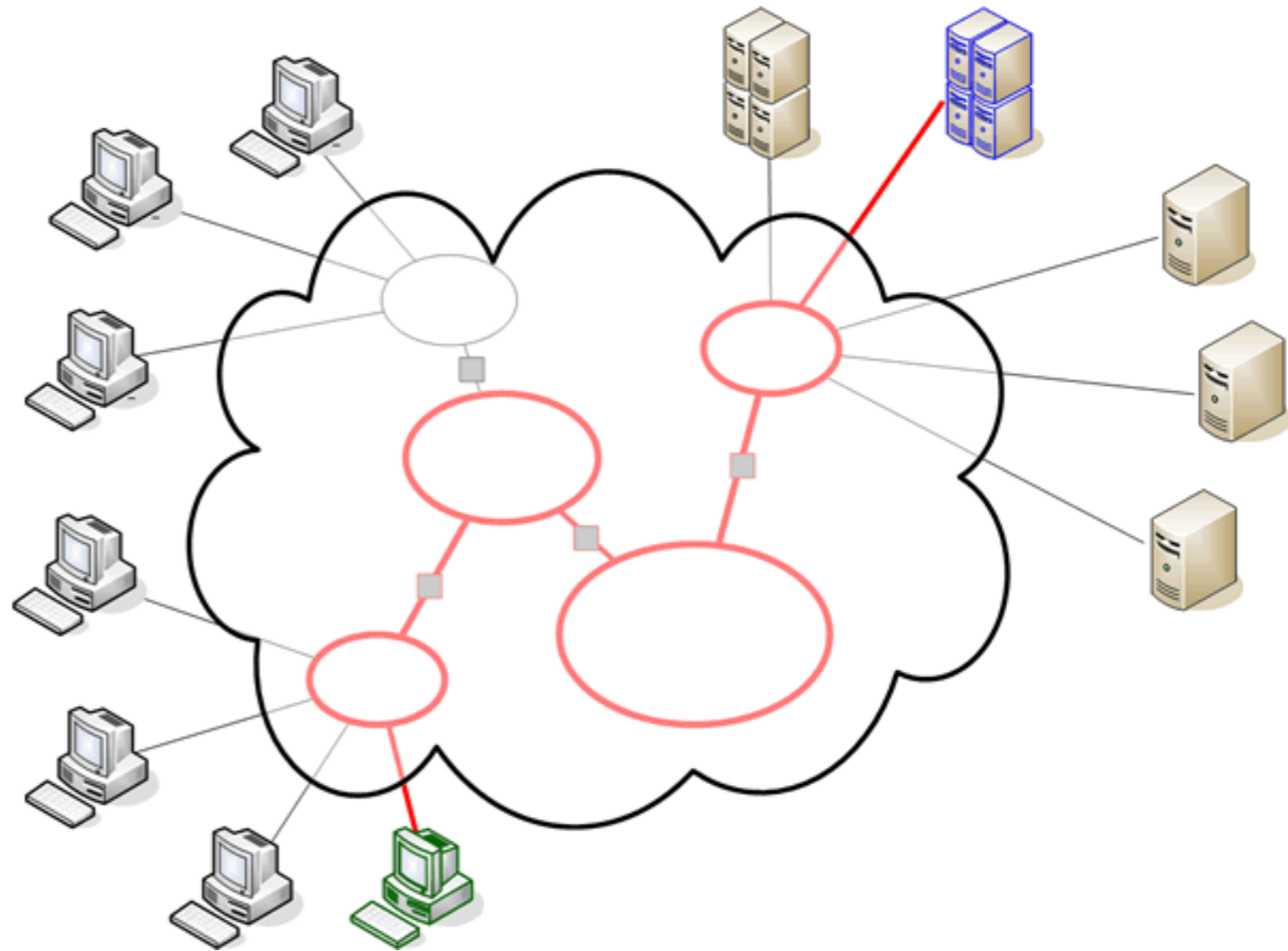
- The Module

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The Internet



The Internet

- Global network infrastructure connecting millions of computers.
- More than 190 countries linked
- 3,137,102,200 Internet users (04/06/2015 www.internetlivestats.com)
- 952,105,920 websites.

Underlying nature of the Internet - Protocols & Standards

The irony is that in all its various guises -- commerce, research, and surfing -- the Web is already so much a part of our lives that familiarity has clouded our perception of the Web itself.

[Tim Berners-Lee](#) in [Weaving the Web](#)

- Email
 - SMTP
 - POP
 - IMAP
- File Transfer
 - FTP
 - SFTP
 - FTP over SSH
- Login
 - Telnet
 - SSH
- Web
 - HTTP, HTML
- Messaging
 - XMPP

Agenda

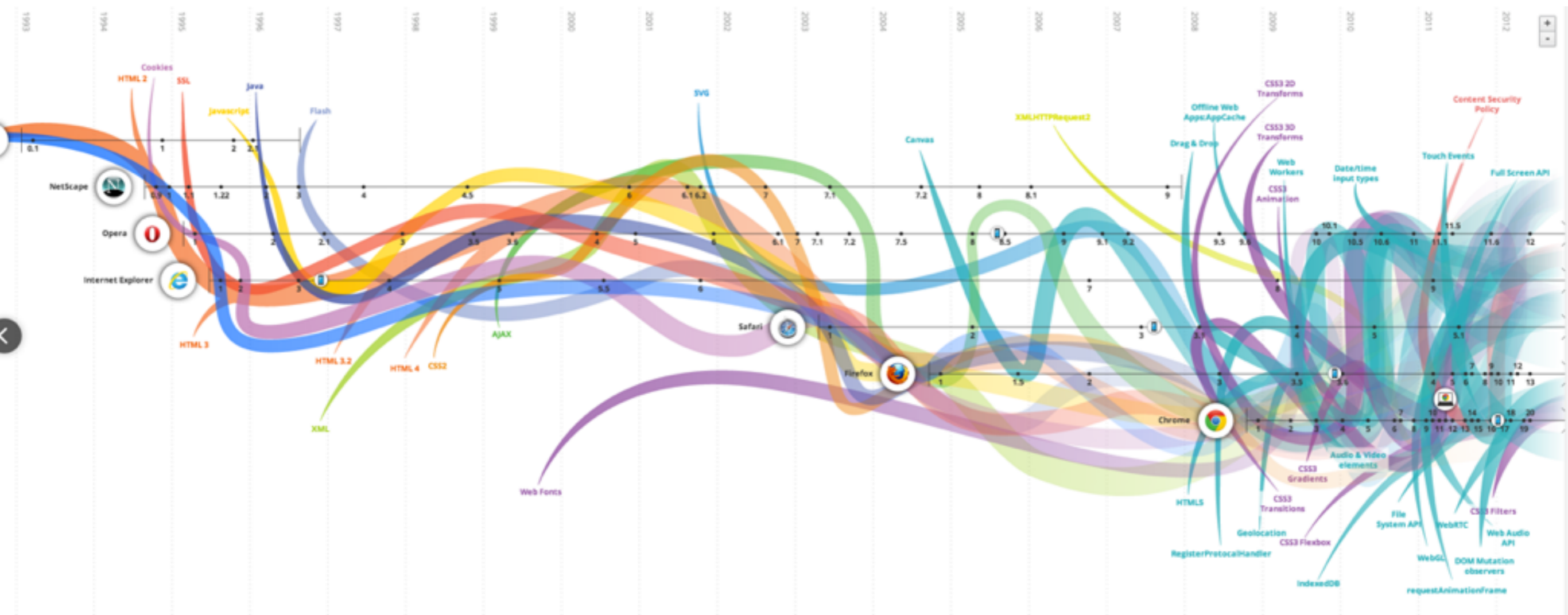
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World Wide Web

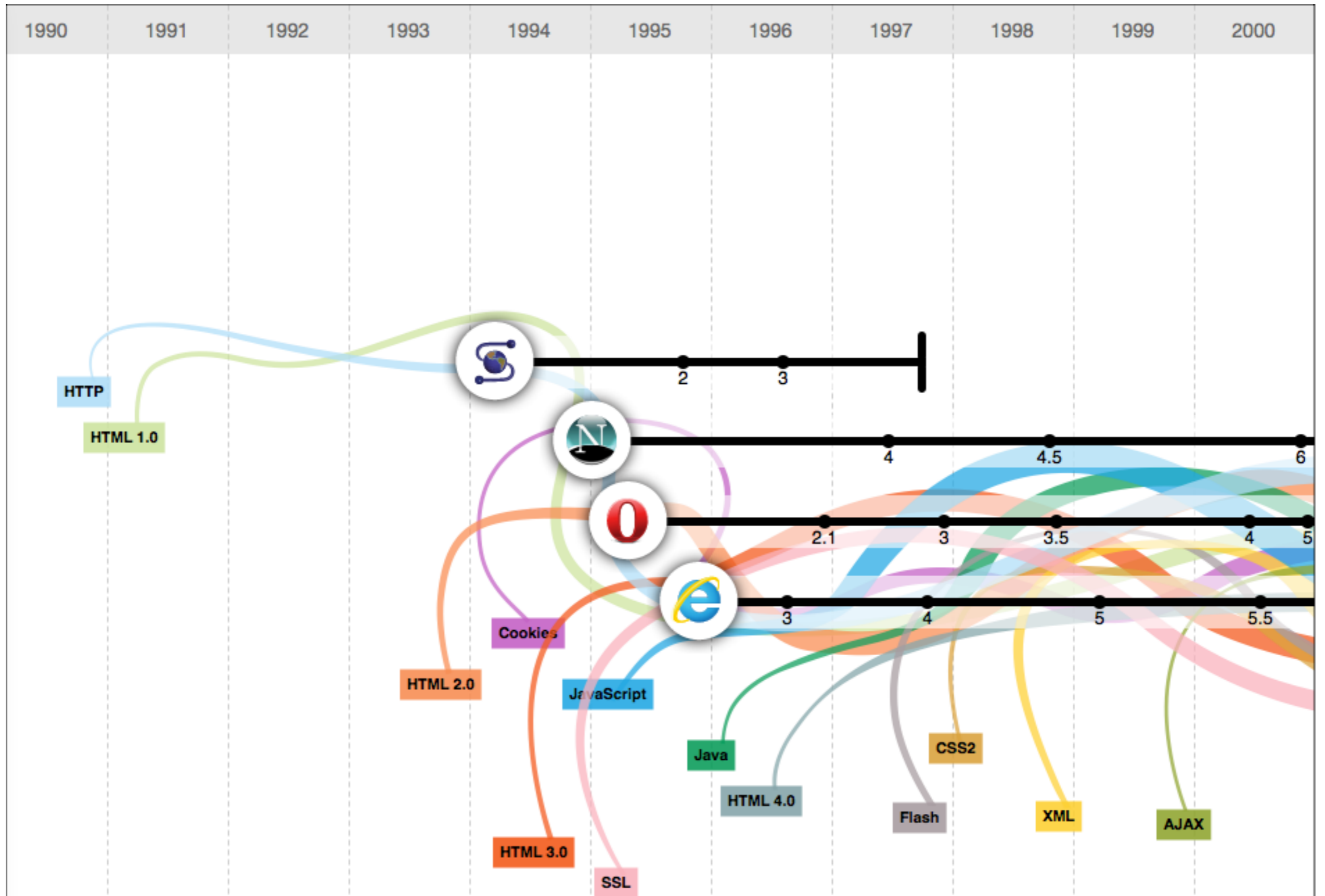
- The world wide web is a huge globally distributed collection of information and data that can be accessed via the internet with the help of of http: Hypertext Transfer Protocol
- WWW has made the Internet the most important communication medium of our days.
- Thanks to the simple to use graphical interface – The Web Browser – the WWW provides everyone with simple access to information



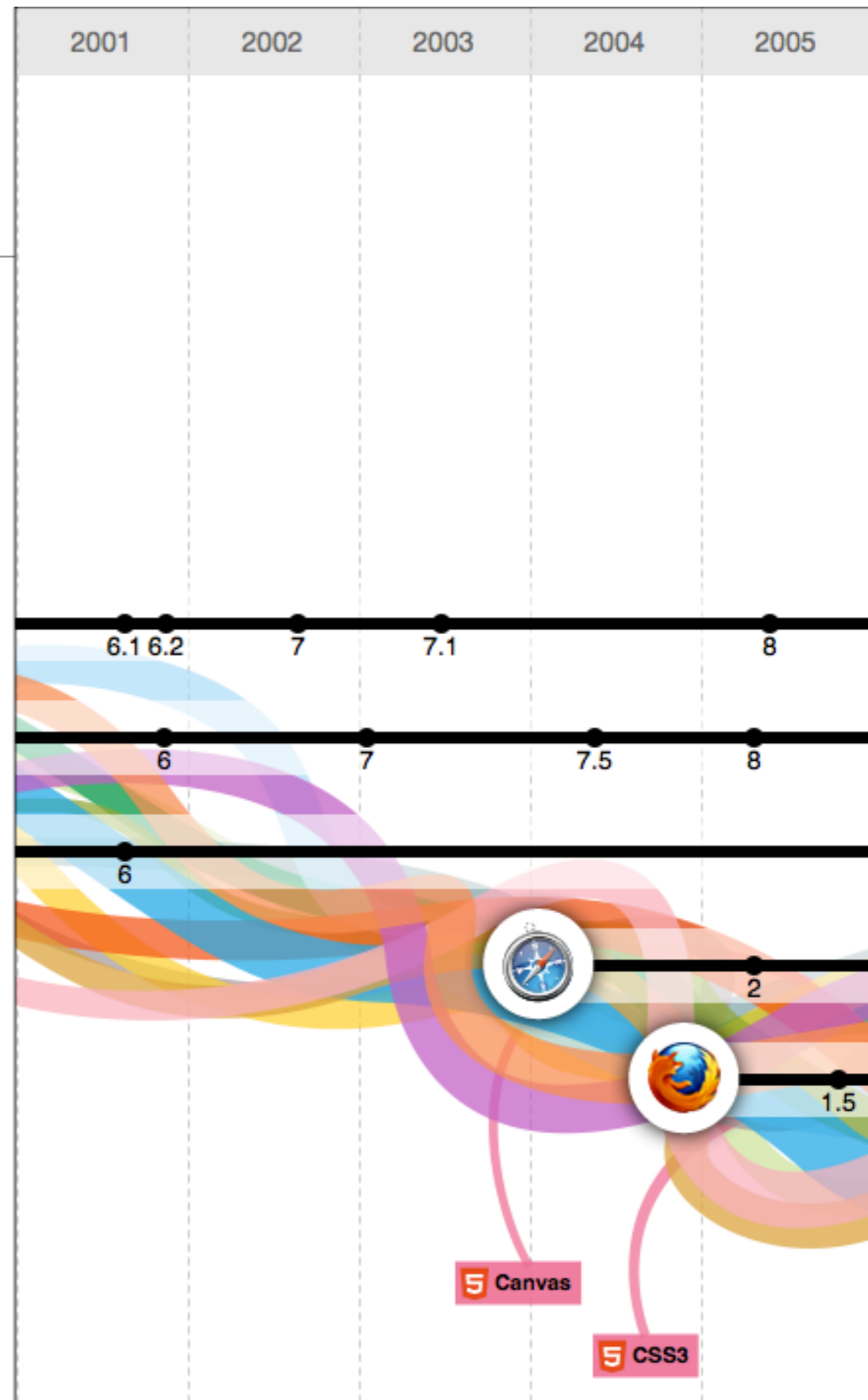
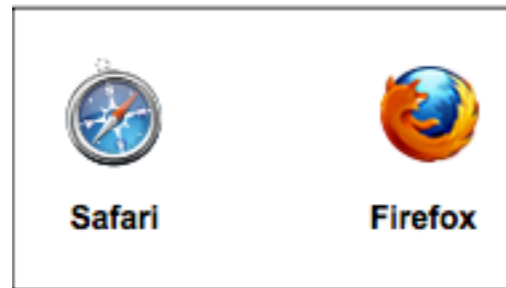
Evolution of the Web - 1990-2012



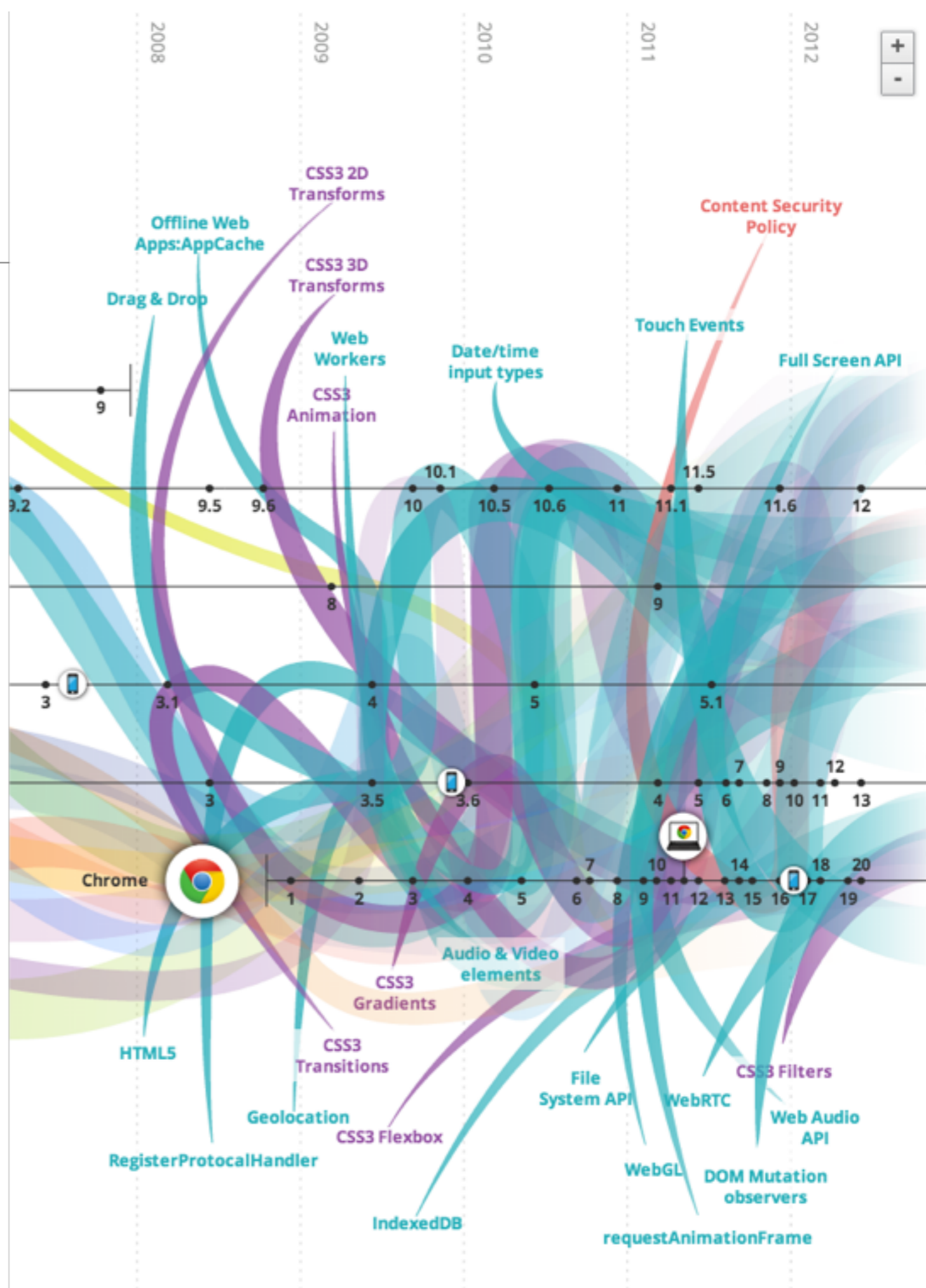
Evolution of the Web - 1990-2000

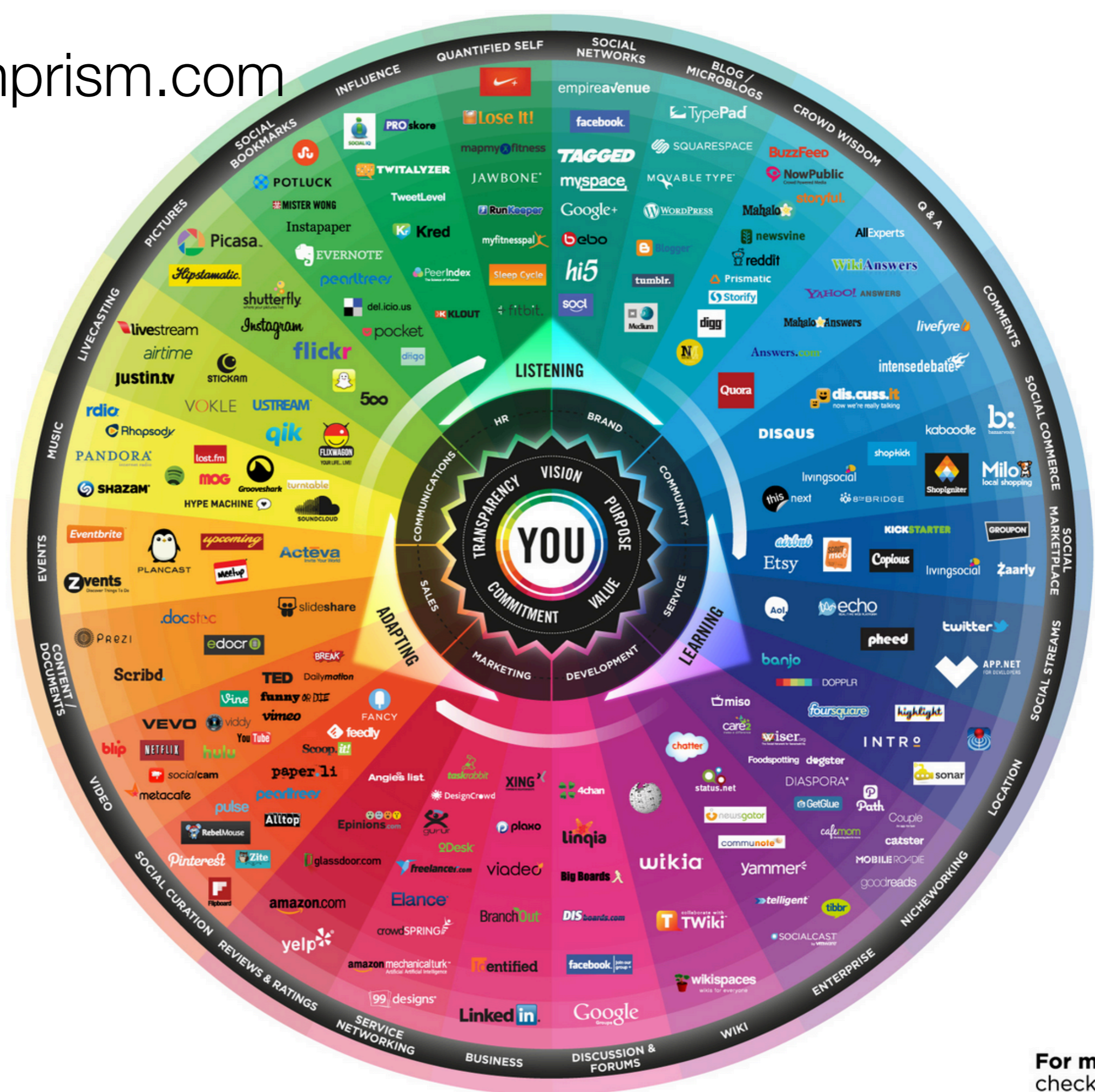


2001-2005



2006-2012





Devices

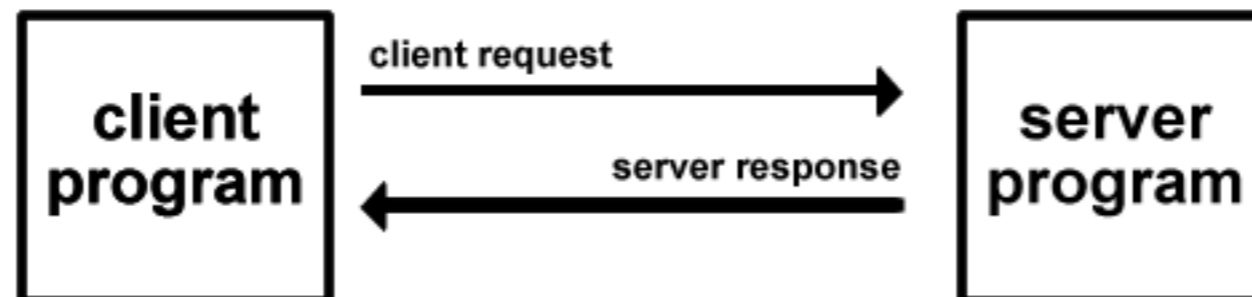


The Web

- Protocols & Standards
 - Protocol : agreed vocabulary to enable two programs to communicate
 - Standard: an agreed definition of the structure and meaning of a document
- Web Protocol
 - Hyper Text Transfer Protocol - HTTP
- Web Standard
 - Hyper Text Markup Language - HTML
- Web Servers and Web Browsers use HTTP to exchange HTML documents

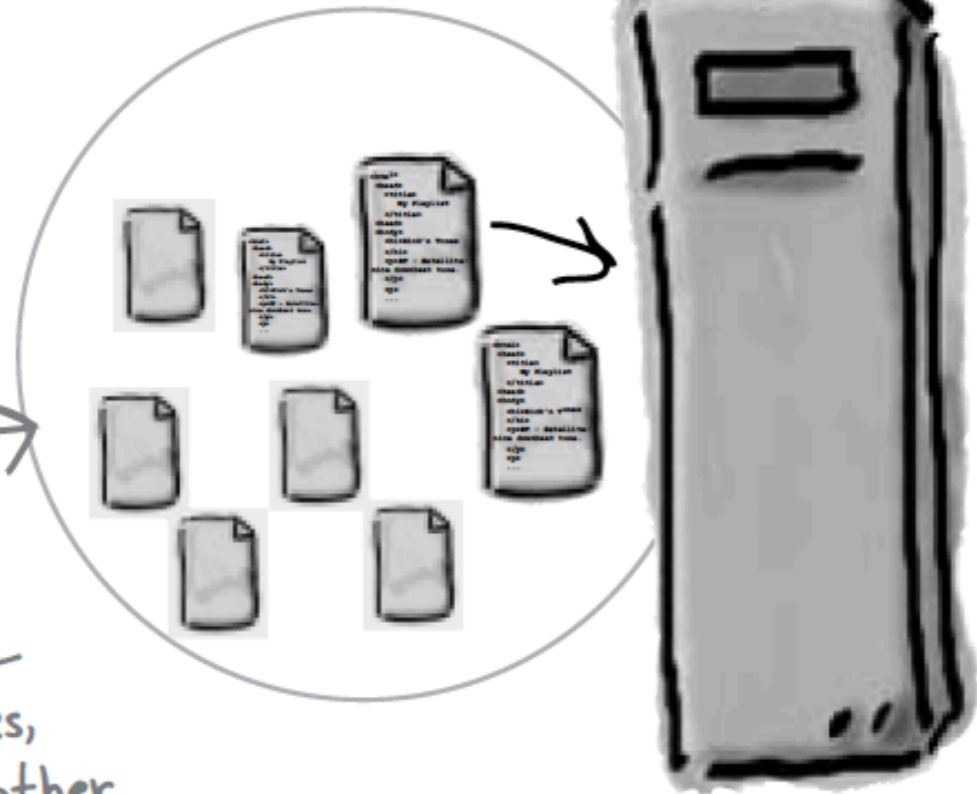
Clients and Servers

- Client/Server Computing:
 - The interaction between two programs when they communicate across a network.
 - A program at one site sends a request to a program at another site and awaits a response.
 - The requesting program is called a client; the program satisfying the request is called the server.



Role of Server

The server's just a computer connected to the Internet waiting for requests from browsers.



Each server stores HTML files, pictures, sounds and other file types.

Web Server

"I need the HTML file 'lounge.html!'"



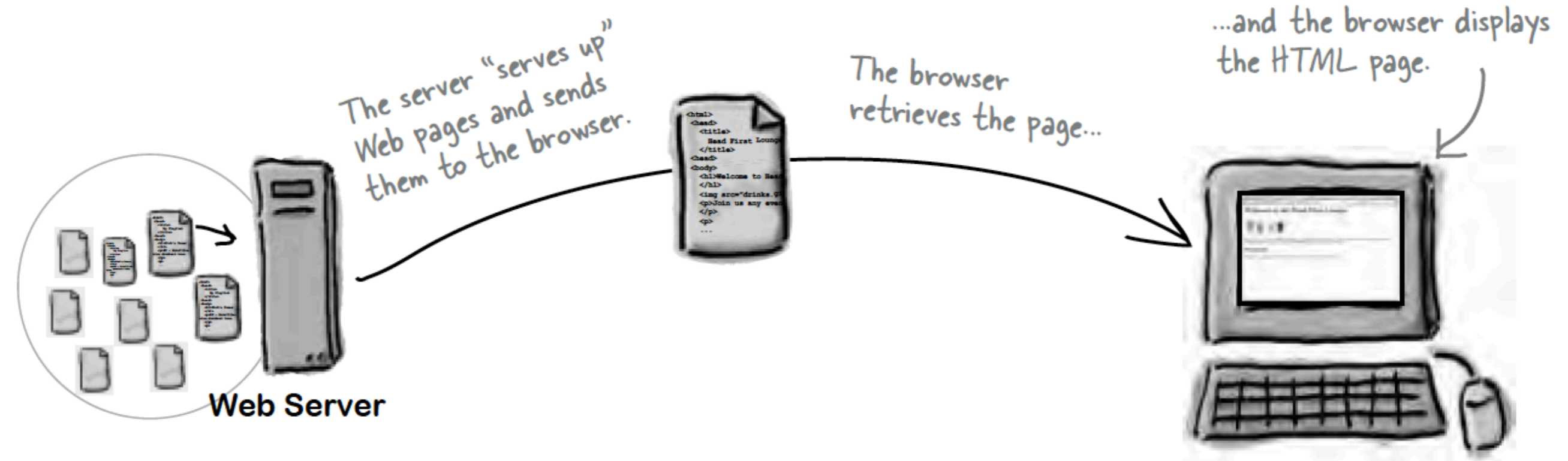
"Found it, here ya go"

...and if the server can locate the resource, it sends it to the browser.

Browsers make requests for HTML pages or other resources, like image.



Role of Client



Hyper Text Markup Language

- HTML tells your browser about the structure of your document:
 - where the headings are,
 - where the paragraphs are,
 - what text needs emphasis, etc
 - what text needs to be linked
 - what images to be displayed
- Given this information, browsers have built-in default rules for how to display each of these elements.
- This information is conveyed using “Tags”, this denotes the intention of the author regarding the structure and display of the document.

HTML

- An HTML document is called a 'page'
- The starting page of a site is called the 'homepage'
- Markup language should only be used for the description of the document structure and not to describe the document presentation
- Every HTML document consists of two parts:
 - Document 'header': contains information about the document.
 - Document 'body': contains the content of the document.

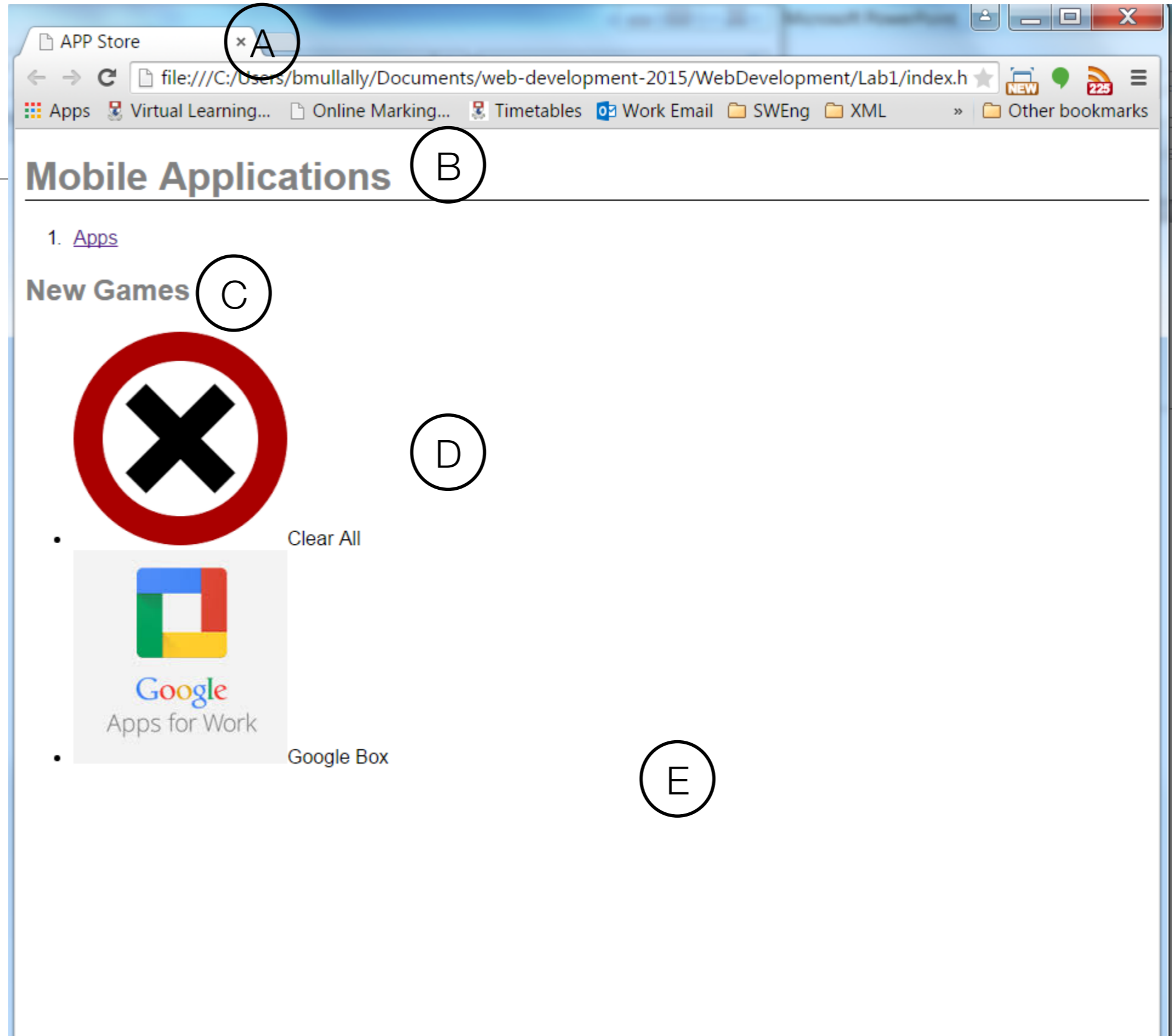
HTML Tags (more correctly called Elements)

Tags for this week

```
<html>  
<head>  
<title>  
<body>  
<h1>  
<h2>  
<em>  
<a>  
<img>  
<style>
```

- Grouped by purpose:
 - Structural
 - <html>, <head>, <title>, <body>
 - Text
 - Heading
 - <h1>, <h2>
 - Text
 - <p>,
 - Hypertext
 - <a>
 - Image
 -
 - Style
 - <style>

The Page



index.html

✕

```
1 <!DOCTYPE HTML>
2 <html>
3   <head> (A)
4     <title>APP Store</title>
5     <link type="text/css" rel="stylesheet" href="style.css" media="screen" /> (E)
6   </head>
7   <body>
8     <h1>Mobile Applications</h1> (B)
9     <ol>
10    <li><a href="apps.html">Apps</a></li>
11  </ol>
12  <h2>New Games</h2> (C)
13  <ul>
14    <li>Clear All</li> (D)
15    <li>Google Box</li>
16  </ul>
17 </body>
18 </html>
```

HTML Complete List.

<!--...-->
<!doctype>
<a>
<abbr>
<acronym>
<address>
<applet>
<area>

<base>
<basefont>
<bdo>
<big>
<blockquote>
<body>

<button>
<caption>
<center>
<cite>
<code>
<col>
<colgroup>
<dd>

<dfn>
<dir>
<div>
<dl>
<dt>

<fieldset>

<form>
<frame>
<frameset>
<h1>
<h2>
<h3>
<h4>
<h5>
<h6>
<head>
<hr>
<html>
<i>
<iframe>

<input>
<ins>
<isindex>
<kbd>
<label>
<legend>

<link>
<map>
<menu>
<meta>
<noframes>
<noscript>
<object>

<optgroup>
<option>
<p>
<param>
<pre>
<q>
<s>
<samp>
<script>
<select>
<small>

<strike>

<style>
<sub>
<sup>
<table>
<tbody>
<td>
<textarea>
<tfoot>
<th>
<thead>
<title>
<tr>
<tt>
<u>

<var>

Complete List by Purpose (1)

- **Structural**
 - body, head, html, title
- **Text**
 - abbr, acronym, address, blockquote, br, cite, code, dfn, div, em, h1, h2, h3, h4, h5, h6, kbd, p, pre, q, samp, span, strong, var
- **Heading**
 - h1, h2, h3, h4, h5, h6
- **Block**
 - address, blockquote, div, p, pre
- **Inline**
 - abbr, acronym, br, cite, code, dfn, em, kbd, q, samp, span, strong, var
- **Hypertext**
 - a
- **List**
 - dl, dt, dd, ol, ul, li
- **Applet, deprecated.**
 - applet, param
- **Text Extensions**
 - **Presentation**
 - b, big, hr, i, small, sub, sup, tt
 - **Edit**
 - del, ins
 - **Bi-directional text**
 - bdo
- **Forms**
 - **Basic Forms**
 - form, input, label, select, option, textarea
 - **Forms**
 - form, input, select, option, textarea, button, fieldset, label, legend, optgroup

Complete List by Purpose (2)

- **Tables**
- **Basic Tables**
 - `caption, table, td, th, tr`
- **Tables**
 - `caption, table, td, th, tr, col, colgroup, tbody, thead, tfoot`
- **Image**
- `img`
- **Client-side Imagemap**
- `area, map`
- **Object**
- `object, param`
- **Frames**
- `frameset, frame, noframes`
- **Iframe**
- `iframe`
- **Metainformation**
- `meta`
- **Script**
- `script, noscript`
- **Style**
- `style`
- **Link**
- `link`
- **Base**
- `base`
- **Legacy, deprecated.**
- `basefont, center, dir, font, isindex, menu, s, strike, u`

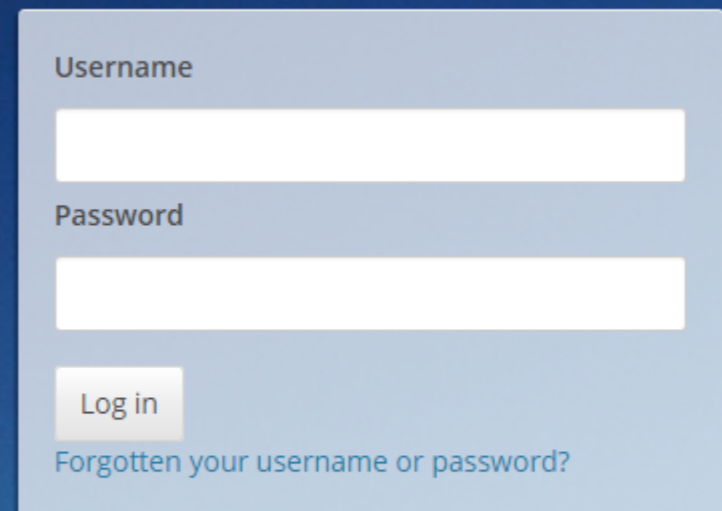
Moodle

Welcome to Moodle at WIT!

Moodle is WIT's online learning platform, a place where staff and students alike can participate and engage in the varying activities of their assigned modules.

Log in to access your module notes, assignments and other updates from your lecturers.

[Get help with Moodle](#)

A login form with a light blue background. It contains two input fields: one for 'Username' and one for 'Password'. Below the password field is a 'Log in' button and a link for 'Forgotten your username or password?'.

Username

Password

Log in

[Forgotten your username or password?](#)

© Image courtesy of Terry Murphy Photography

Labs Philosophy

- Learn by Doing
- Supported by reading Associated chapter in Head First HTML (in general, 1 chapter per lab)
- Supervised by module team
- *Do Exercises & Don't be afraid to experiment - **you cant break the web!***

Introducing HTML x Head First HTML and x

file:///C:/Users/bmullally/Documents/web-development-2015/public/topic01/index.html

Apps Virtual Learning... Online Marking... Timetables Work Email SWEng XML Other bookmarks

Web Development

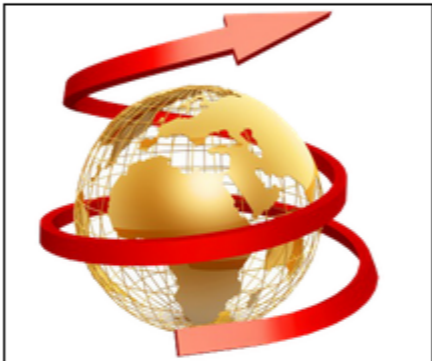
Introducing HTML

Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE


Introducing HTML

The Nature of the Web

The World Wide Web permeates or lives to an extraordinary degree. However, most of us are unaware of the its technical underpinnings. In this session we explore the nature of the Web and in particular the role of HTTP protocol and the HTML standard. We also identify the 'client/server' nature of the web and its implications. In this context we will gain an understanding of the role of the 'browser' in presenting a web page, and begin to understand pages are retrieved and rendered.




HTML Basics



We can now explore the basics of HTML and we will try to get to grips with the fundamentals of the HTML language. As you will see, its structure and format is relatively straightforward, and you will be able to understand the basics very quickly. We will be focusing on a small number of 'tags' to get started, and also on the ways in which different html files can be linked together to form a site.

Lab: Lab-01



The labs are where you will do the real learning in this module. In Lab0-01 you will become familiar with the editor Sublime. We will then use this editor to

Weekly topic area with links to pdf document for each lecture and a link to the current weekly lab.

Steps

- Instructions for each step

Introducing HTML

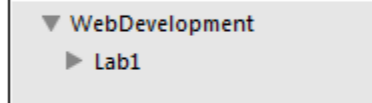
Lab-01 01 02 03 04 Exercises

First Project

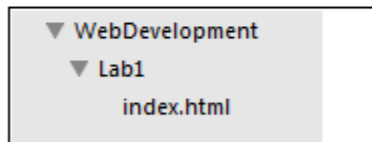
If you are working on a pc in the IT lab, create a new folder on either your G drive or on your usb drive, name the folder WebDevelopment, inside that folder create another folder called Lab1.

Open Sublime and choose Open Folder from the File menu. Navigate to the WebDevelopment folder and choose click OK.

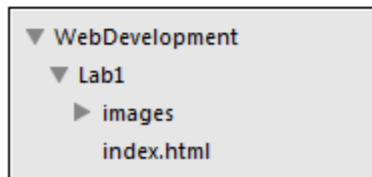
In sublime click on the WebDevelopment folder, you should see the Lab1 folder appear.



Chose New File from the File menu, a new blank page should appear in the sublime window. Click Save on the File menu and name the file index.html, save it into the Lab1 folder. You should see the file name appear in the left panel in sublime.



Now in File Explorer create another folder in Lab1 that is called images



Next you are to save 6 images into the images folder:

If you are working on a pc in the IT lab, create a new folder on either your G drive or on your usb drive, name the folder WebDevelopment, inside that folder create another folder called Lab1.

Open Sublime and choose Open Folder from the File menu. Navigate to the WebDevelopment folder and choose click OK.

In sublime click on the WebDevelopment folder, you should see the Lab1 folder appear.



Next you will write some html code. Copy and paste in the following code:

index.html page content


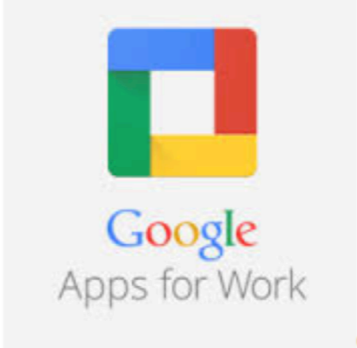
```
<!DOCTYPE HTML>
<html>
  <head>
    <title>APP Store</title>
  </head>
  <body>
    <h1>Apps, Movies, Music, Books</h1>
    <ol>
      <li><a href="apps.html">Apps</a></li>
    </ol>
    <h2>New Games</h2>
    <ul>
      <li>Clear All</li>
      <li>Google Box</li>
    </ul>
  </body>
</html>
```

- Typical Step:
- Short motivation
- Screen shots to show outcome
- Some html to type
- More screen shots to
- show expected outcome
- Not a race! - Take your time
- 2 hours timetabled/supervised
- Reflect as you go along

Mobile Applications

1. [Apps](#)

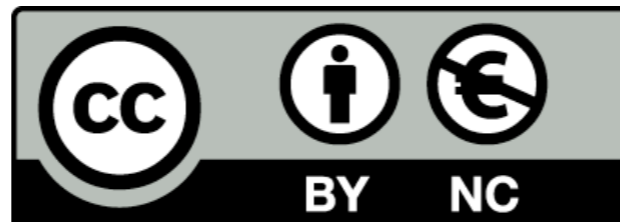
New Games

-  Clear All
-  Google Box

Objectives for Lab 01

- Be able to download and install Sublime Text 2, and understand its key features.
- Create a WebDevelopment folder to contain a new Lab folder each week.
- Create a simple static web site, and be able to manage it within the Sublime environment
- Familiar with the following HTML elements:
 - `<html>` `<head>` `<title>` `<link>` `<body>` `<h1>` `<h2>` `<p>` `<a>` `` ``
and ``

-
- Good Luck!



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