REPRESENTING DATA: HTML, HYPERTEXT & MARKUP

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TL/DR

Using HTML to create HyperText Documents...

AIMS

- At the end of this section of the module you will be able to:
  - Understand the major elements of the web
  - Use web browser development tools to support development & investigation of web sites
  - Use HTML to create HyperText Documents

OVERVIEW

- At the end of this (sub-section) of the topic you will:
  - understand how HTML has developed & why it works the way it does
  - be aware of the range of tags supported by HTML
  - be able to assemble basic HTML documents
- Note: We'll consider HTML in general this week then HTML 5/Semantic HTML next week - Why?

HTML & THE WEB

- HTML is generally processed by Web browsers
- The Web was designed for ease of publication - non-programmer should be able to develop & deploy Web-sites.
- To achieve this browsers have traditionally been very accommodating in what they will accept
- Many sites are very long lived - don't want to break sites just because a new version of HTML, CSS, JS, &c. is available
- So you will see code from lots of versions of the Web & should be in a position to handle it (HTML in general) but we should aim to develop using the latest tools (e.g. HTML5) - particularly because HTML 5 (semantic HTML) added organisational elements that are distinct from previous versions.

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HTML

- **H**yper**T**ext **M**arkup **L**anguage
- A **language** for turning **text** into **hypertext** by using **markup**
    - NB. This is just one way of creating hypertext (it is just perhaps the most dominant)
- The standard markup language for creating web pages
- Not a programming language - no support for programming constructs
- Part of the triad of foundational web technologies (alongside CSS & Javascript)
    - Describes the semantic structure of the data, which CSS presents, and Javascript manipulates
- Browser receives HTML document from server or storage
- Document is then rendered visually (NB. Other user agents may use the returned HTML in other ways)

WHAT DOES AN HTML DOCUMENT LOOK LIKE?

- Like this:

```
<!DOCTYPE html>
<html>
  <head>
    <title>My first HTML 5 document</title>
  </head>
  <body>
    <p>Hello World from HTML 5</p>
  </body>
</html>
```

- Plain text - can write HTML in any text editor and only need to save it as a .html document (which can then be opened in a browser)

W3C

- World Wide Web Consortium (W3C) defines the standards for the web, e.g.
    - HTML 4.01
        - Based on Standard Generalised Markup Language (SGML)
    - HTML 5
        - Backwards compatible but no longer based on SGML
- & various related standards: XHTML 1.0, 1.0, 2 (cancelled)
    - Based on eXtensible Markup Language (XML)
- You might see any or all of these versions and related languages whilst working with hypertext systems - we don't always get to build new stuff from scratch in the latest versions
- NB. The W3C also does a lot more than just define core web standards

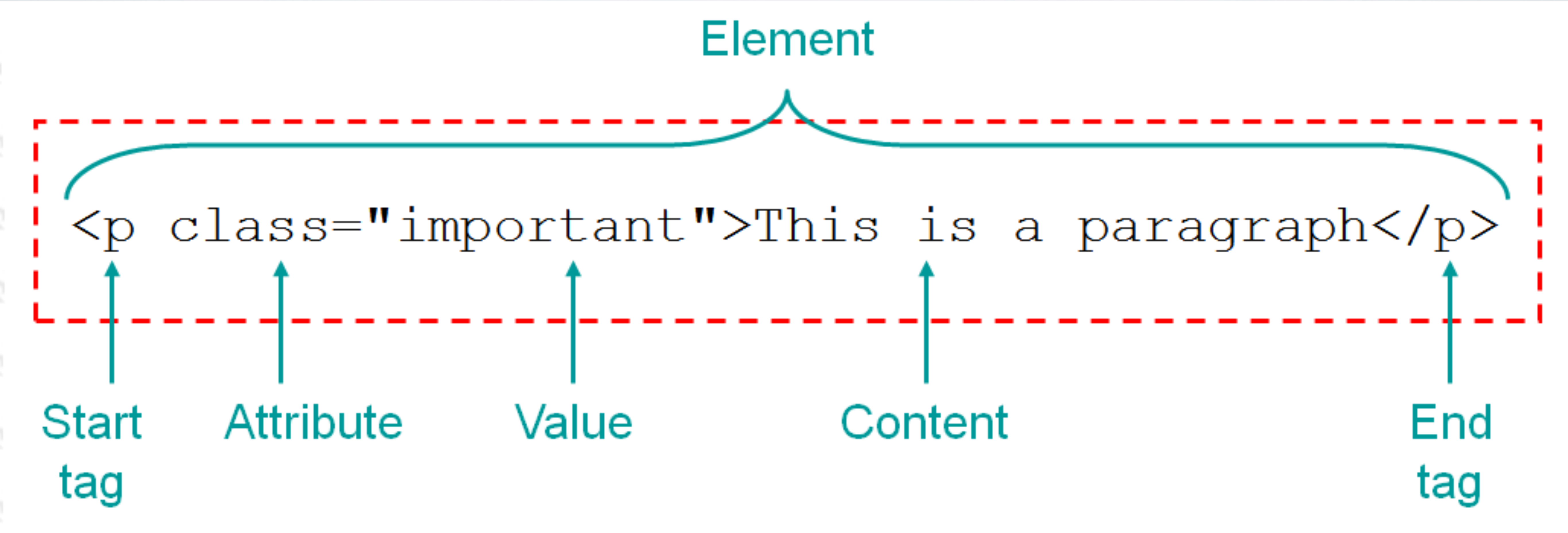
CLASSICAL TO MODERN

- Until 4.01 defined the visual presentation of a web page
  - Mixed structure & presentation
  - e.g. font face & font size, colour, size of elements, etc.
- Modern HTML
  - Describes the content, it's structure, and it's relation to other content
  - Visual presentation of those things is delegated to CSS

HTML ELEMENTS

- HTML documents are constructed from HTML Elements
- Elements are **keywords** encapsulated within angle brackets, e.g. <html>
- Elements are represented using opening and closing tags, e.g. <html></html>
    - Most tags delineate the start & end of a portion of text or enclose other sets of tags so often paired - one for each end
    - Some stand alone amongst the text, e.g. <br />
    - All use angle brackets
- Combined to create structured documents by denoting structural semantics for the text (such as headings, paragraphs, lists, links, etc.)

HTML ELEMENT STRUCTURE



Element

```
<p class="important">This is a paragraph</p>
```

Start tag

Attribute

Value

Content

End tag

HTML VERSIONS

- As you investigate various web pages you will notice considerable variation amongst versions of HTML

- We should write HTML to the current version, e.g. HTML 5, but we should be aware of what earlier versions looked like

- Let’s compare HTML documents from two versions…

HTML 4.01

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN”
    "http://www.w3.org/TR/html4/strict.dtd">
<HTML>
  <HEAD>
    <TITLE>My first HTML 4.01 document</TITLE>
  </HEAD>
  <BODY>
    <P>Hello World from HTML 4.01</P>
  </BODY>
</HTML>
```

HTML 5

```
<!DOCTYPE html>
<html>
   <head>
      <title>My first HTML 5 document</title>
   </head>
   <body>
      <p>Hello World from HTML 5</p>
   </body>
</html>
```

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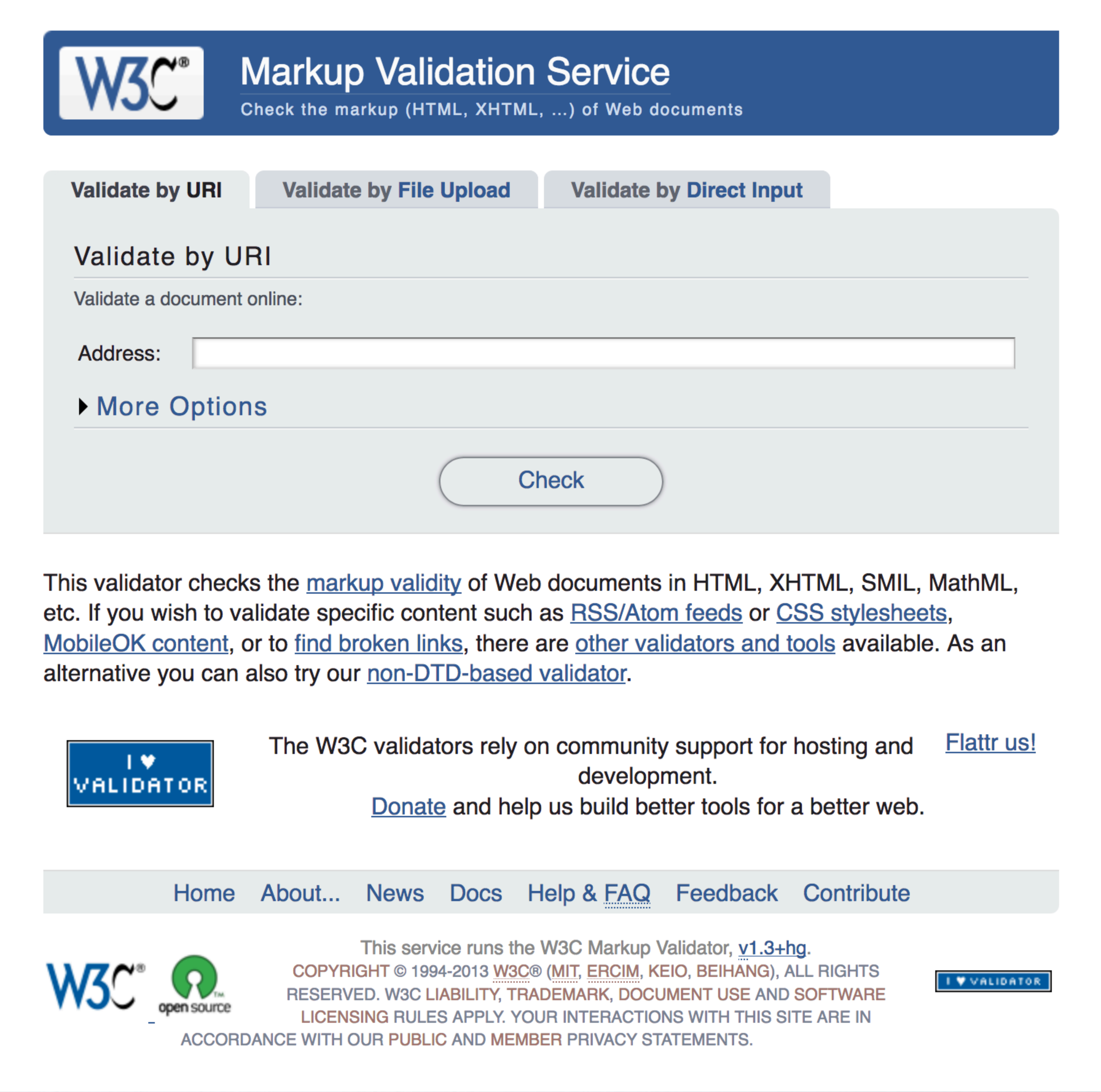
VALIDITY

- HTML is a language
  - It has a syntactic structure that can be verified as correct (or otherwise)
  - It also has *semantics* (meaning) - but we'll return to that later
- There are tools to automatically verify that a given HTML document is correct (or otherwise):
  - https://validator.w3.org/



Markup Validation Service

Check the markup (HTML, XHTML, ...) of Web documents

Validate by URI

Validate a document online:

Address:

This validator checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc. If you wish to validate specific content such as RSS/Atom feeds or CSS stylesheets, MobileOK content, or to find broken links, there are other validators and tools available. As an alternative you can also try our non-DTD-based validator.

The W3C validators rely on community support for hosting and development.
Donate and help us build better tools for a better web.

Flattr us!

This service runs the W3C Markup Validator, v1.3+hg.

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TAGS

- Document Structure: <html><head><body>
- Within <head> section: <title>, <base>, <meta>, <style>, <link>
- Tags for text blocks: <address>, <blockquote>, <div>, <h1>...<h6>, <p>, <pre>, <xmp>
- Tags that define lists: <dir>, <dl>, <dt>, <dd>, <menu>, <ol>, <ul>, <li>
- Tags that define text format: <b>, <basefont>, <big>, <cite>, <code>, <em>, <font>, <i>, <kbd>, <strike>, <sup>, <tt>, <u>, <var>
- Tags that define anchors and links: <a>
- Tags that define images and image maps: <img>, <area>, <map>

- Tags that define tables: <table>, <caption>, <thead>, <tbody>, <tfoot>, <tr>, <th>, <td>
- Tags that define forms: <form>, <fieldset>, <input>, <select>, <option>, <textarea>, <label>, <legend>, <isindex>
- Tags that define frames: <frame>, <frameset>, <iframe>
- Tags that define scripts: <script>, <noscript>
- Tags that define applets & plug-ins:<applet>, <param>, <object> (<embed> not standard)
- Tags that adjust text: <br>, <center>, <hr>

TEXT FORMATTING

- Headings: <h1>, …, <h6>
- Physical Styles: <b>, <i>
- Logical Styles: <cite>, <code>, <em>, <strong>

- <font face=“” size=“”>
  - You can do this but don’t. EVER.
  - Always use CSS for presentational aspects of typography
  - Support for presentational aspects within HTML is slowly being phased out

LISTS

- Definition Lists
  - <dl>, <dt>, <dd>
- Ordered Lists
  - <ol>, <li>
- Unordered lists
  - <ul>, <li>

LINKS

- From the Hypertext perspective links are the most important element of HTML
- Hyperlinks turn text into hypertext using two types of link (internal & external):
  - **Internal Links**
    - Link: <a href="#name"> … </a>
    - Target: <a name="name">…</a>
    - *Target also known as an anchor*
  - **External Links**
    - To another document in same site: <a href="page.html"> </a>
    - To a target within another document: <a href="page.html#name"> … </a>
    - To another site: <a href="http://www.simonwells.org"> … </a>

TABLES

- For data representation (not presentation & layout)
  - Although admittedly there is some overlap
- Uses mix of <table>, <tr>, <th>, <td> tags
- Also: <thead>, <tbody>, <tfoot>, <caption> - more semantic structure

```
<table>
 <tr>
  <th>Heading 1</th>
  <th>Heading 2</th>
 </tr>
 <tr>
  <td>data 1</td>
  <td>data 2</td>
 </tr>
</table>
```

IMAGES

- <img> with mandatory attributes: src, alt
- Optional attributes::
  - width, height, longdesc
- Image types: GIF, JPG, PNG - browser support is so good that we don’t consider this so much anymore
- NB. Image size

FORMS

- Everything so far has been about retrieving HTML pages from the server - using the **HTTP GET** method
- Sometimes we want to send data from the client to the server (using the **HTTP POST** method)
  - More commonly using a **for**
  - We'll exploit this more when we start using Javascript

```
<form name="name"
   action="page.html"
   method="method">
   … various controls …
   </form>
```

FORM CONTROLS

- **Buttons:**

```
<input type="submit">

<input type="reset">

<input type="button">

<input type=“image">
```

- **Check boxes:**

```
<input type=“checkbox”>
```

- **Radio buttons:**

```
<input type=“radio”>
```

- **Text boxes**:

```
<input type=“text”>
```

- **Password textboxes:**

```
<input type=“password”>
```

- **Hidden fields:**

```
<input type=“hidden”>
```

MORE FORM CONTROLS

- **File Upload:**

  <input type=“file”>

- **Selection Lists:**

  <select> <option> <optgroup>

- **Text Areas:**

  <textarea>

- **Label (for a control)**

  <label>

- **Group of controls:**

  <fieldset>, <legend>

RESOURCES

- MDN HTML Reference:

  https://developer.mozilla.org/en-US/docs/Web/HTML/Element

- W3Schools HTML Examples:

  https://www.w3schools.com/tags/

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SUMMARY

- You should now:
  - understand how HTML has developed & why it works the way it does
  - be aware of the range of tags supported by HTML
  - be able to assemble basic HTML documents
- There is obviously much more to effective HTML use than we can cover in one lecture, but we can develop effective skills through practise

QUESTIONS ???

COMING UP…

- We've seen the range of HTML tags available - but that doesn't mean we should aim to use them all in every document…
- Semantic HTML - Using HTML5 tags to efficiently impose meaning & structure on your pages.