

Introduction to Web App Development



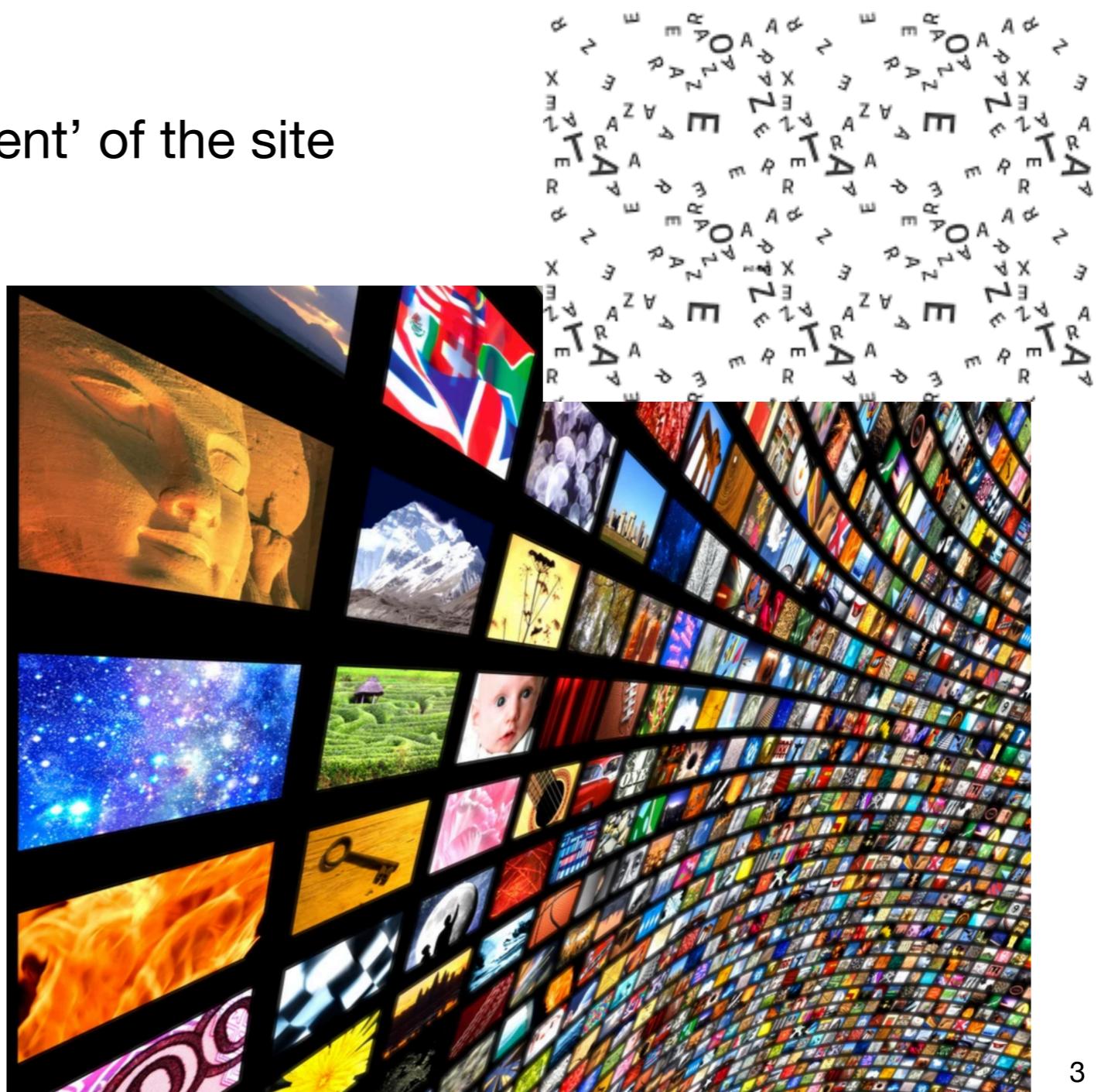
Building a Web Site

- Step 1: Determine Theme + Content
- Step 2: Devise Navigation Structure
- Step 3: Create Page Structure
- Step 4: Factor out Page Structure in (reusable) Templates
- Step 5: Apply a Style
- Step 6: Build, Test & Deploy



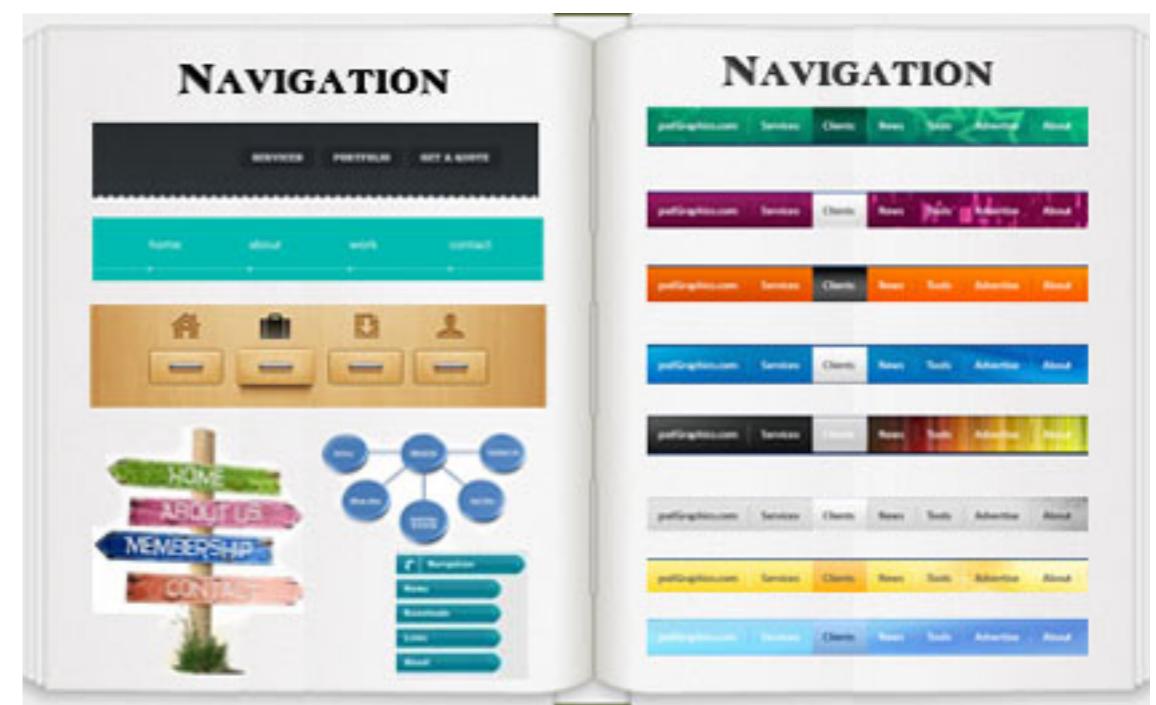
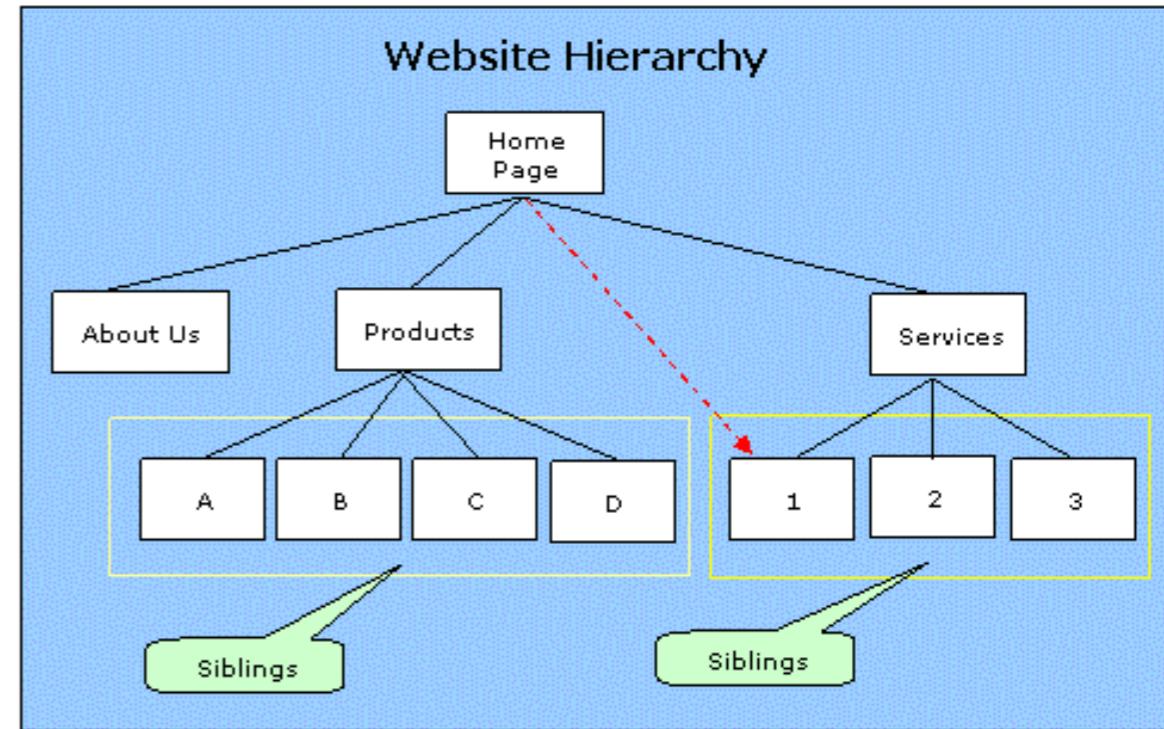
Web Site: Step 1: Determine Theme + Content

- Agree a ‘theme’ and ‘look and feel’ for site with customer
- Acquire or develop the core ‘content’ of the site
 - Text
 - Images
 - Media (video/audio)



Web Site: Step 2: Determine Navigation Structure

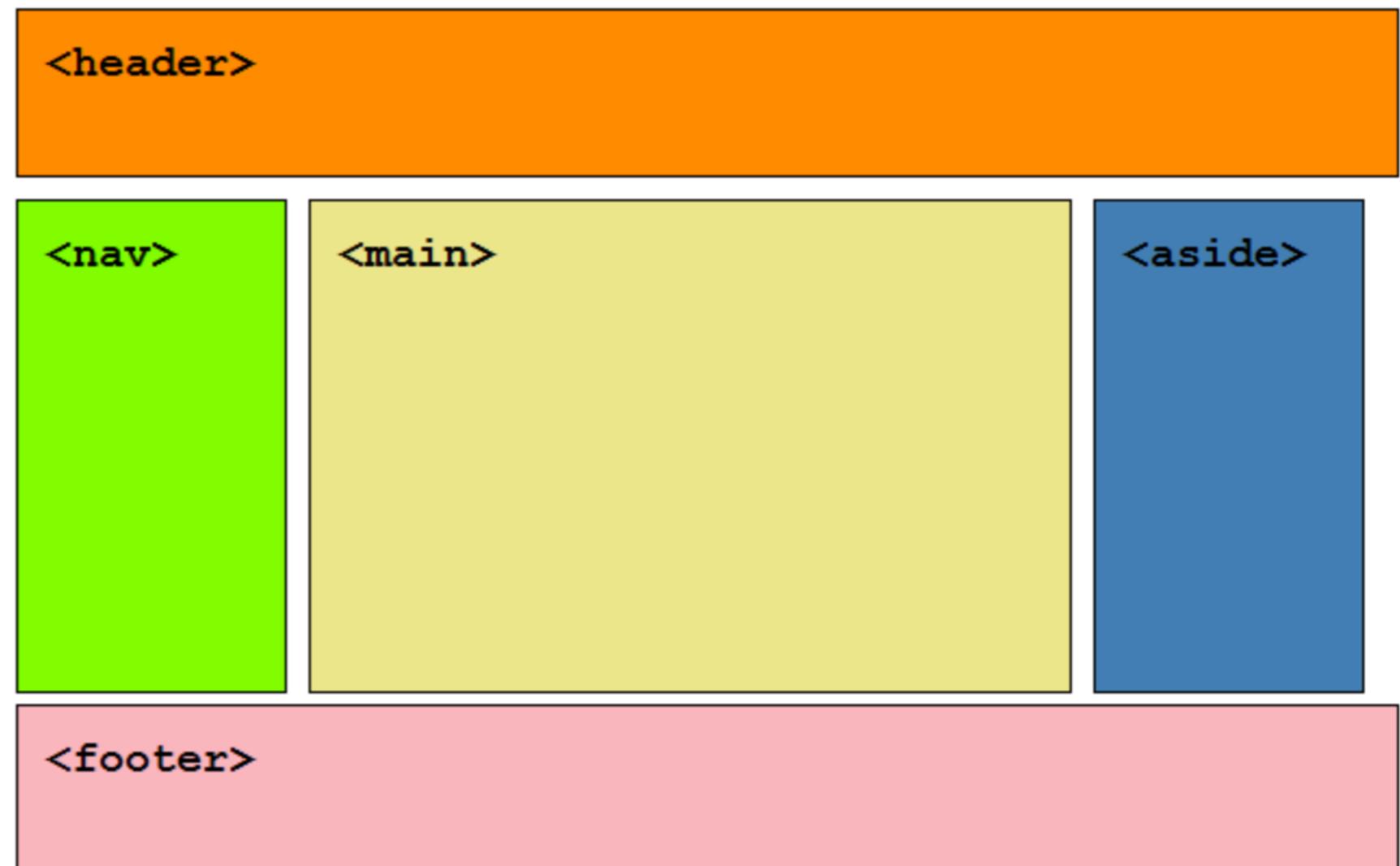
- Determine number of pages in the site
- Decide on navigation ‘metaphor’
 - ‘Tabs’
 - Sidebar
 - Menubar



Web Site: Step 3: Create Page Structure

- Typical Sections:

- Header
- Footer
- Navigation
- Main Content
- Primary
- Secondary



Step 4: Factor out Page Structure in (reusable) Templates

```
└── harp.json
└── public
    ├── assets
    │   └── images
    │       | ....
    └── includes
        ├── _curriculum.ejs
        ├── _footer.ejs
        ├── _header.ejs
        ├── _sponsors.ejs
        └── _summary.ejs
    ├── index.ejs
    └── strands
        ├── data.ejs
        ├── devices.ejs
        ├── maths.ejs
        ├── networks.ejs
        ├── programming.ejs
        └── project.ejs
    └── style.css
```

```
<!DOCTYPE html>
<html lang="en">
<head...>
<body>

<header id="header">
<h2>

Department of Computing & Mathematics
</h2>
<h3> BSc (Hons) the Internet of Things </h3>
<hr>
</header>

<article class="banner">
<div id="summary">
<p>
    BACHELOR OF SCIENCE (HONOURS)
</p>

<h3>
    APPLIED COMPUTING IN THE INTERNET OF THINGS
</h3>

<h3>
    Program your World!
</h3>
<p>
    An exciting new level 8 Honours Degree for 2015. Combine Programming and Electronics and learn how to code cool devices, places and things. Be part of the next wave of innovation in Computing
</p>
</div>
</article>

<article id="curriculum" ...>
<section id="sponsors">
<hr>
<h4> Supported by leading edge research at... </h4>
<p>



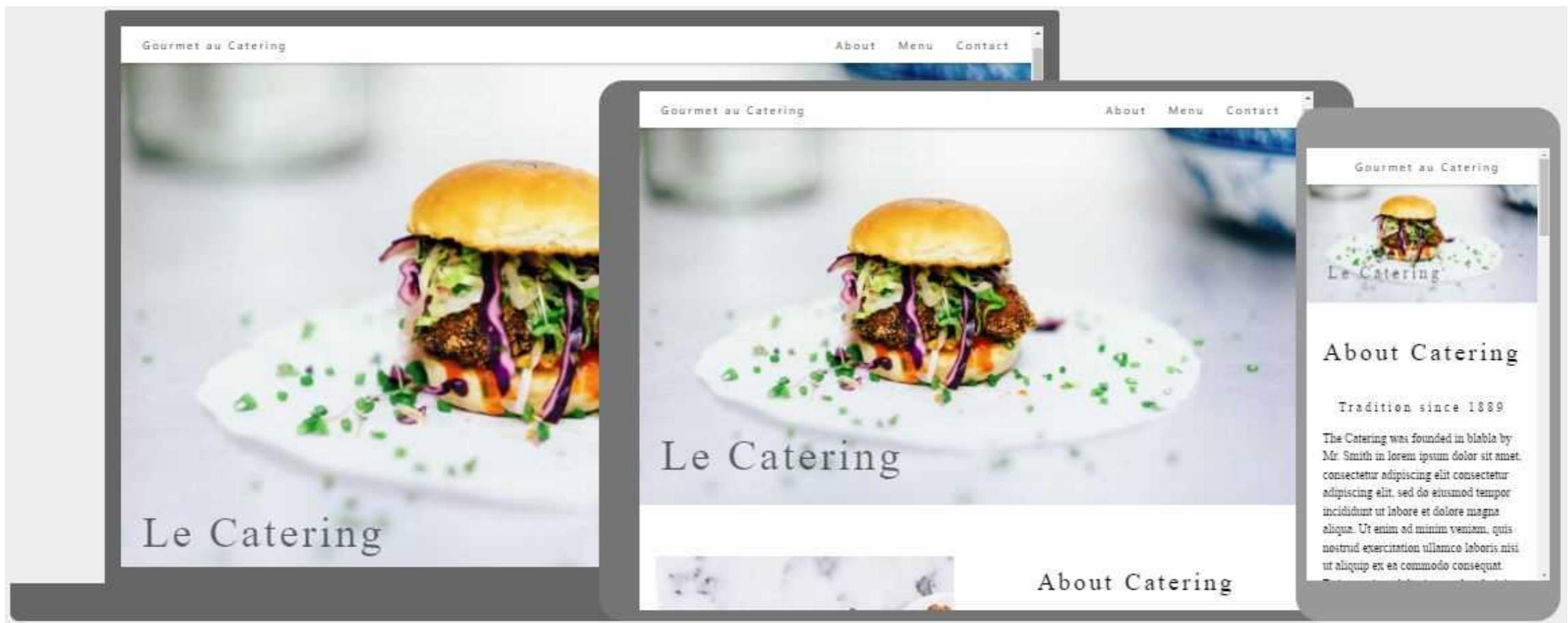
</p>
</section>
<hr>
<h2> Footer </h2>
<p class="footer-social-links">
<a href="http://www.facebook.com/witcomp"> facebook </a>
<a href="http://twitter.com/ComputingAtWIT"> twitter </a>
<a href="https://ie.linkedin.com/pub/computing-at-wit/a9/221/1b6"> linkedin </a>
</p>
</article>

</body>
</html>
```

- ‘Factor out’ sections of the index.html pages into includes...

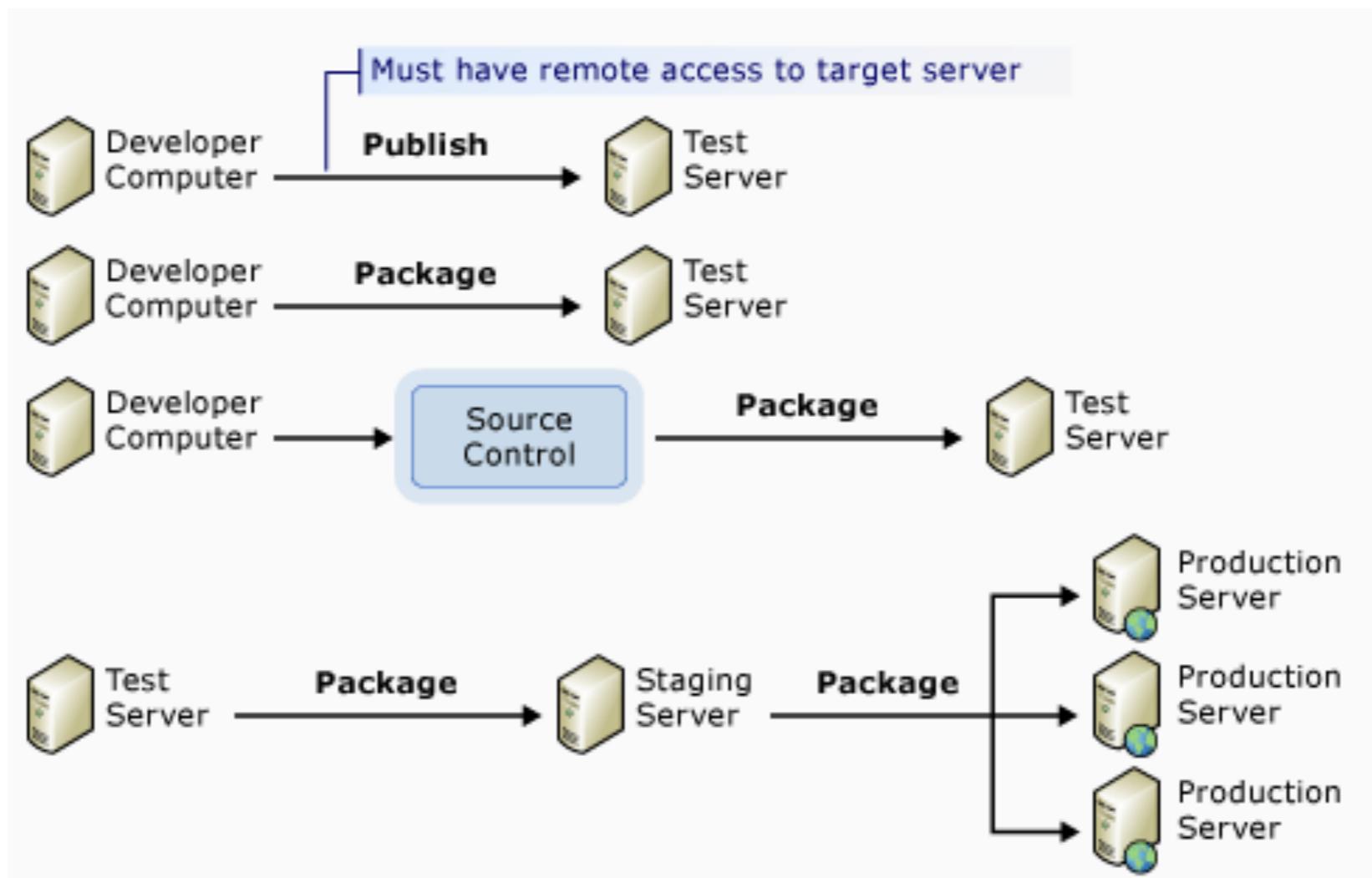
Web Site: Step 5: Apply a Style

- Compose CSS to capture
 - Navigation
 - Layout : structure, layout, number of columns, positioning
 - Look and Feel (theme)



Web Site: Step 6: Build, Test & Deploy

- Build the site itself
- Verify that all links work as expected
- “Push” the site to an external server.

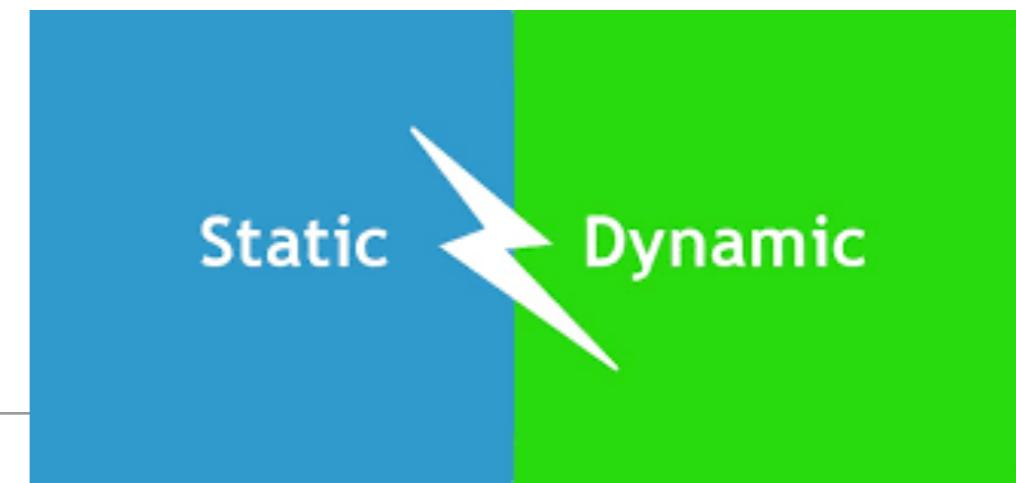


What if...?



- A user is to “Log in” to a site?
- A user needs to supply information to the site?
- The content of some of the pages is not known until the site is ‘live’?
- The content of some pages is very specific to the identity of the current user?
- The site is to implement a ‘business process’ such as
 - shopping cart?
 - payment for a good or service?
 - communication with other users - such as messaging?
- Such features require a ***Dynamic Web Site*** or a ***Web Application***

Static vs Dynamic



- A knowledge of HTML, CSS + simple web deployment is necessary in order to build a *Static Web Site*
- However, these skills are ***not sufficient*** to build a ***Web Application***
- A Web Application is capable of:
 - Responding to user interaction
 - Generating new information based on context
 - Allowing a user to provide information
 - Implement core business processes
- A ***Static Web Site*** is not capable of any of these features.

Web App Development

- Solid understanding of HTML & CSS, including page structure, layout, styling and approaches to navigation

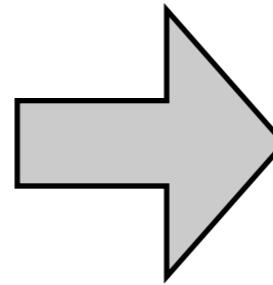
+ knowledge of:

- Structure of the Internet, including role of HTTP, DNS & how URLs are structured
- Detailed understanding of the nature of the HTTP protocol
- Client / Server Architecture
- How pages can be composed of templates
- Databases
- ***How to Programme Application Features (in Java)***



!!!

- Structure of the Internet, including role of DNS & **URLs**
- Nature of the **HTTP protocol**
- **Client / Server** Architecture
- Pages decomposed using **templates**
- **Databases**
- How to **Programme Java** Application Features



- Expanded understanding of the nature of the Internet

However, modern tools & frameworks are starting to dramatically simplify the process.



Play Framework

- A toolkit to enable the construction of **Web Applications** in the Java Programming language
- Does not replace the use of HTML + CSS
 - the toolkit is for building Web Applications, which is built on these technologies
- However, HTML + CSS constructs are restructured to enable them to interoperate with **Programs** written in **Java**
- Play is a **Web Application Development Framework**

