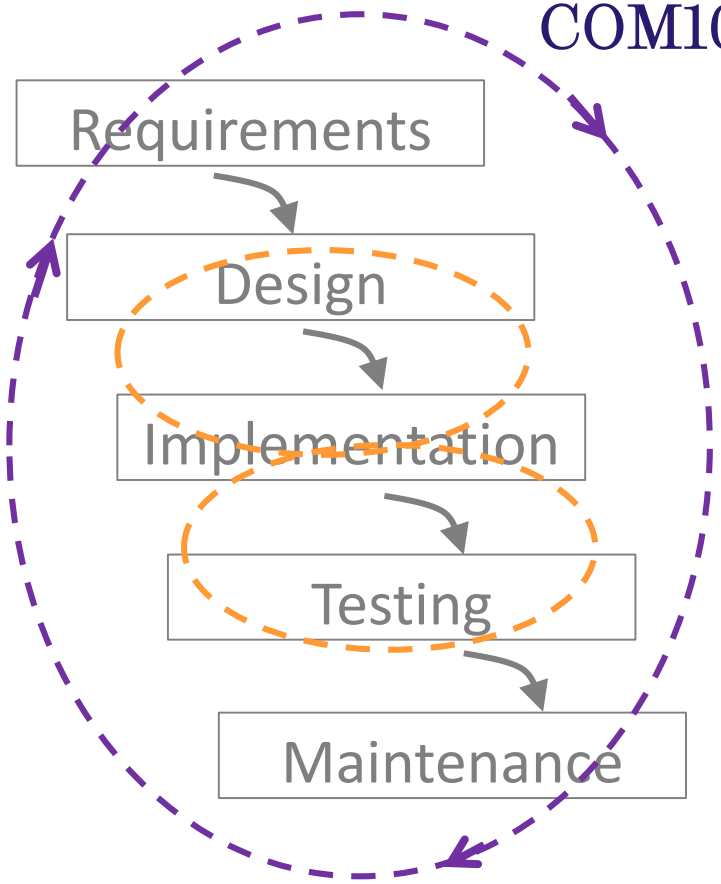
The University Of Sheffield.



COM1004: Web and Internet Technology

Lecture 6: Web site development

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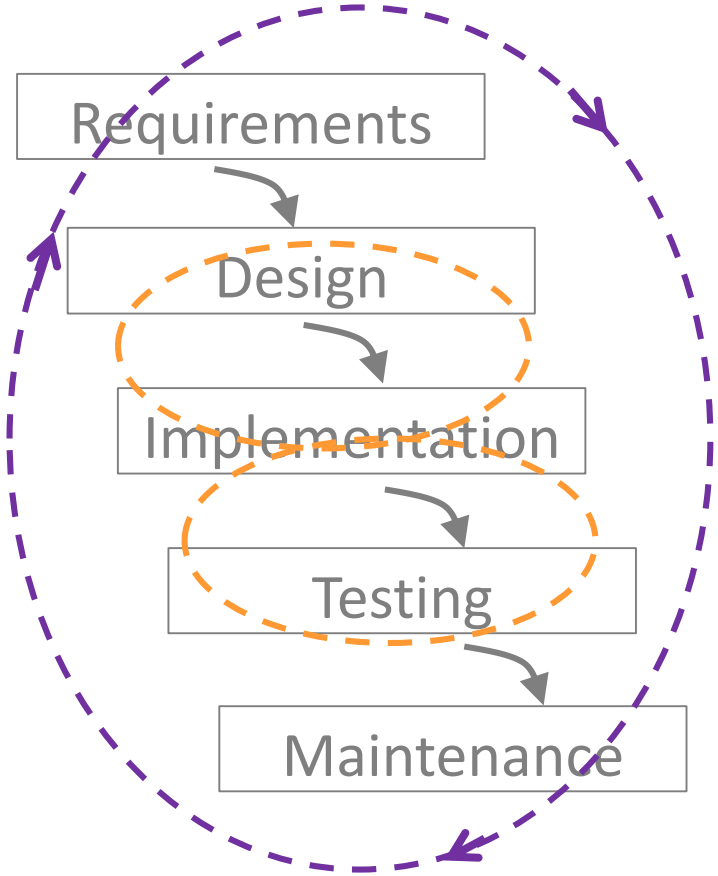
1. Introduction

- We can consider the creation of web sites as similar to a waterfall approach to software engineering
- It involves a series of stages
  - Disagreement on how many stages
  - Disagreement in which stage a particular step is taken
  - Larger companies may use more stages
  - Smaller companies may compress the stages, e.g. planning, design, develop, delivery
- There is iteration between the stages



More likely there will be iteration of stages

Marcotte, E., Responsive Web Design, 2nd edition, A Book Apart, 2014

1.1 We'll consider the following stages:

- Requirements
  - Establish clients needs
  - Purpose
  - Target audience
  - Content
- Planning
- Design
- Development
- Testing
- Delivery
- Maintenance

2. Requirements: Gathering content

- *Example*: Creating a website to support a book.
- Start by listing required content, not structure

Home	Sample Web pages
Site info	Lecture slides
Accessibility statement	Answers to questions
Site map	Teaching notes
Contact	Interactive glossary
Evaluation copy request form	Sample material
About us	Table of contents for book
Links	Errata and updates
Code examples	FAQs

http://webdesignbook.org Chapman and Chapman, 2006, chapter 11

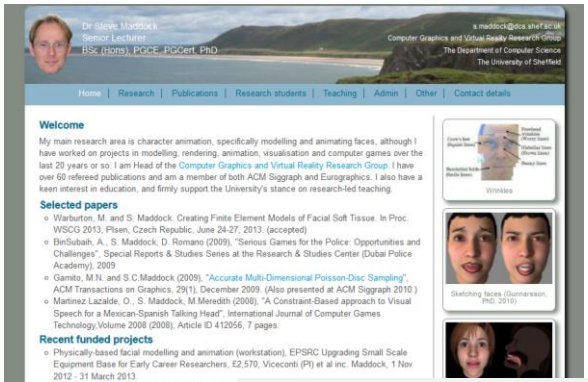
2. Requirements: Gathering content

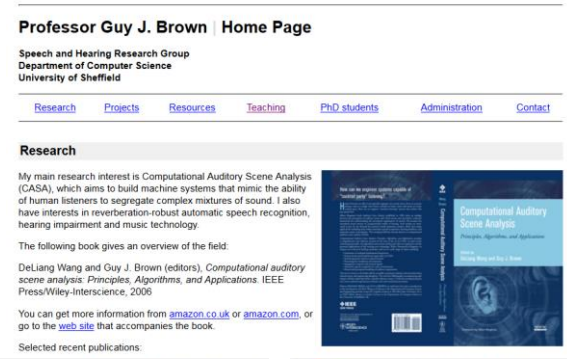
- *Example*: Consider a website for a member of staff in the Dept
- Start by listing content, not structure

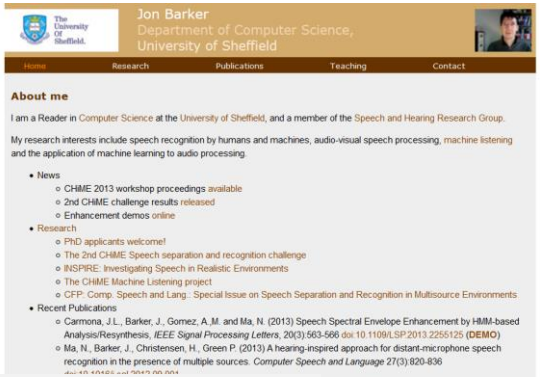
Personal profile/biography	Alumni
Modules currently taught	Research publications
Modules previously taught	Research resources
Tutees	Administration jobs
Dissertation project ideas	Committees
Dissertation project students	Involvement in University-level activites
Research areas	External activities
Research project details	Private area
Funding	News
PhD students	Contact details

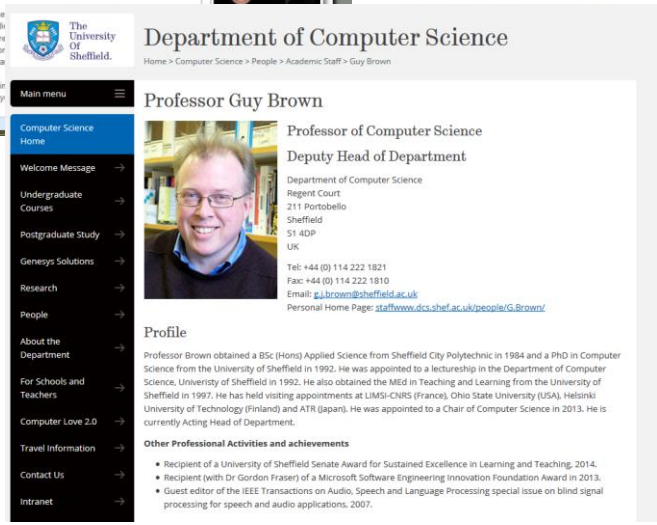
2. Requirements: Purpose

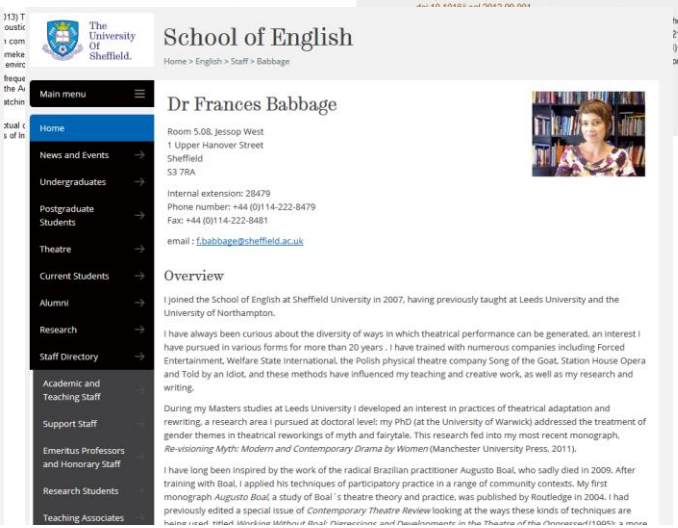
- Example: Personal or corporate website?











Requirements

Planning

- Content
- Site map
- Accessibility
- Technical details
- Wireframes

Design

Development

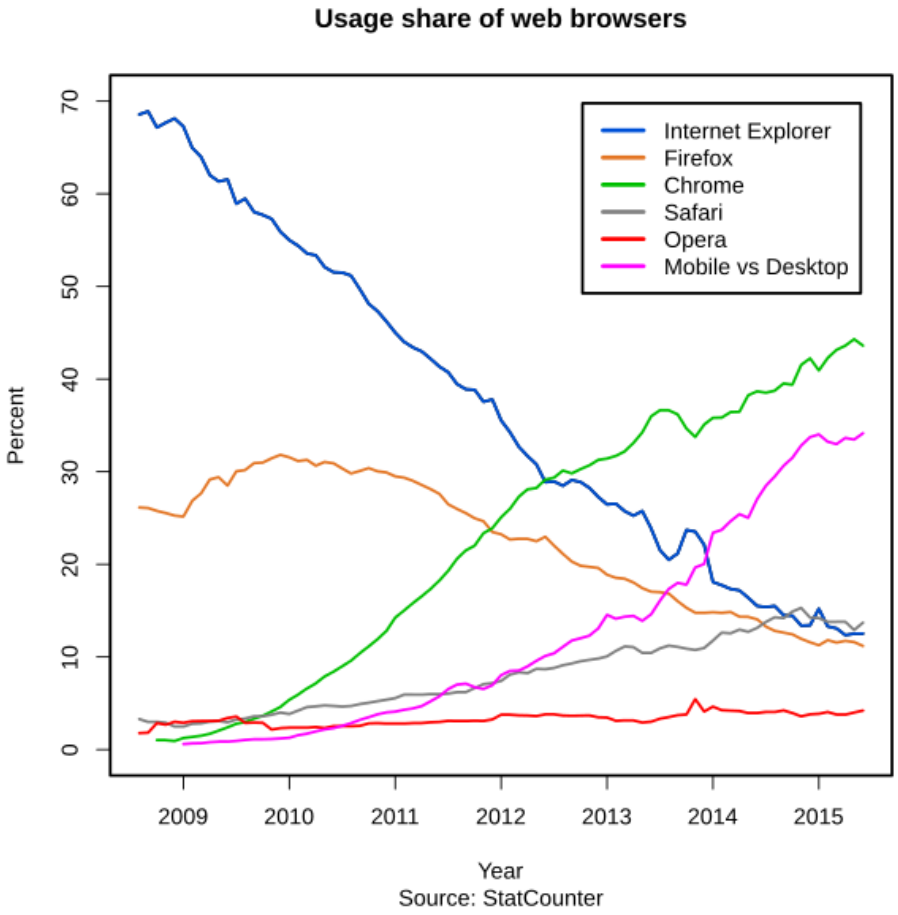
Testing

Delivery

Maintenance

3. Planning

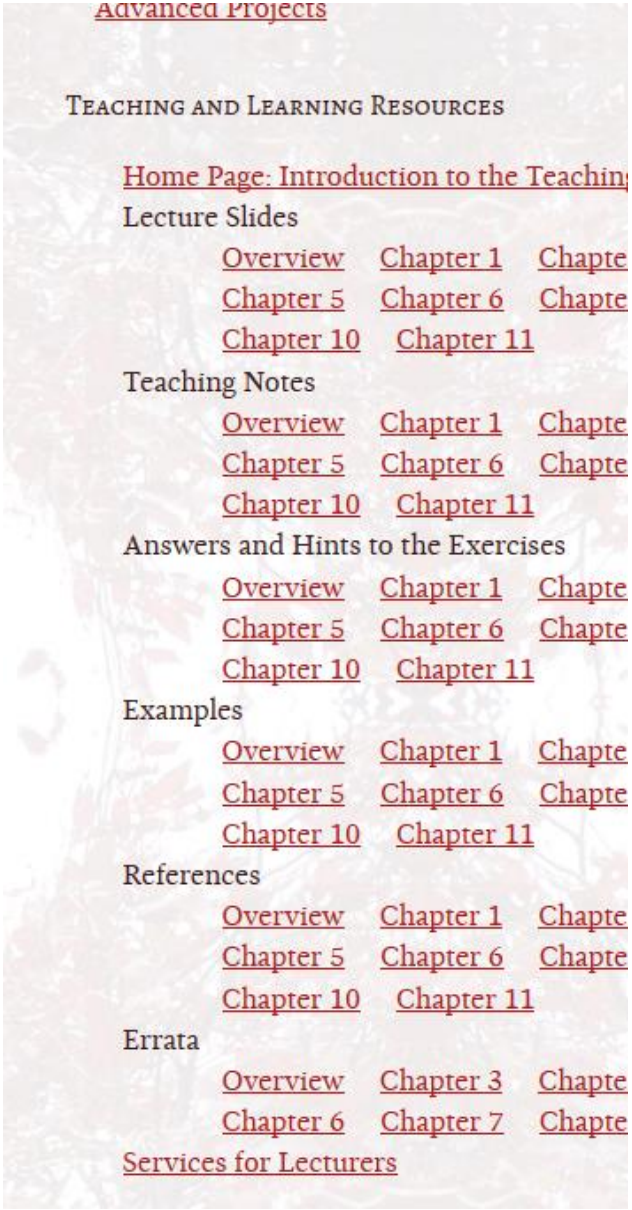
- Identify content
- Create a site map
  - Structure and organisation of the site
- Consider accessibility
- Consider technical details
  - Which browsers will be targeted?
  - Which screen resolutions?
- Prepare wireframes showing proposed general layout(s) of pages



By Usage share of web browsers (Source Net Applications).svg: arichnad, Daniel.Cardenas, Litehacker (Own work) [CC BY 3.0 (http://creativecommons.org/licenses/by/3.0)], via Wikimedia Commons

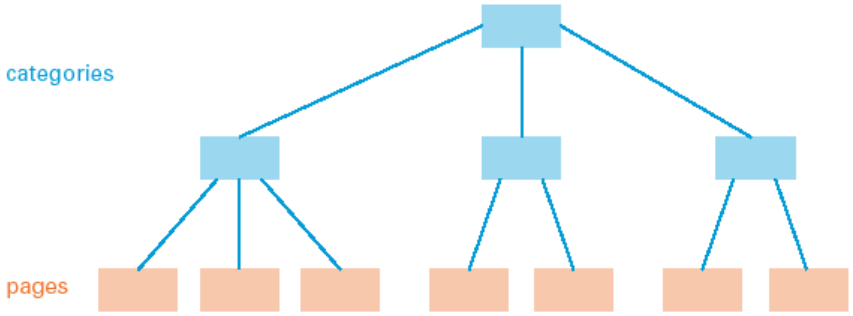
4. Website Structure/organisation

- Site map
  - A list of all the pages on the Web site
  - Organised hierarchically
  - Possibly included as part of the Web site itself
- Site index also used, but more A-Z
- Structures to consider:
  - Logical – relationship between pages
  - URL – relationships between URLs of pages, reflects way they are stored on server
  - Navigational structure – connections between pages
- Data structures: sequence, tree, graph

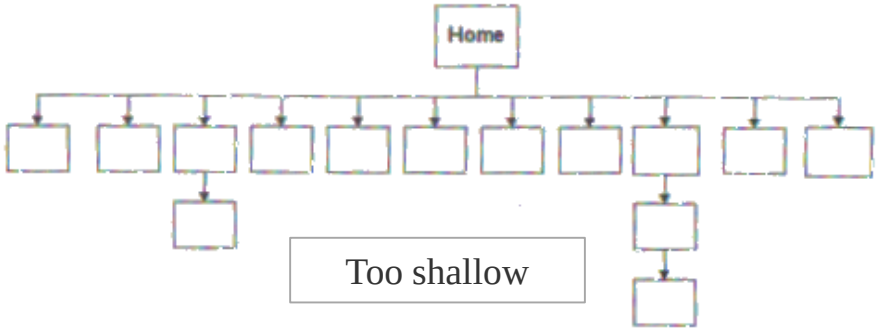


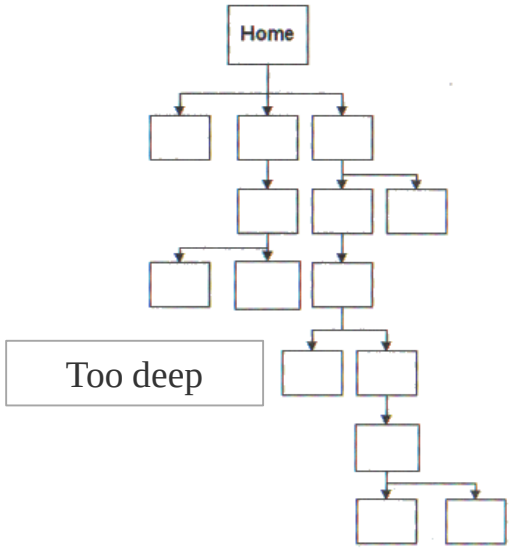
4.1 Logical structure

- Relationship between pages
- A hierarchy groups pages into categories
- "Three-click rule"
  - http://en.wikipedia.org/wiki/Three-click_rule



A pure hierarchy

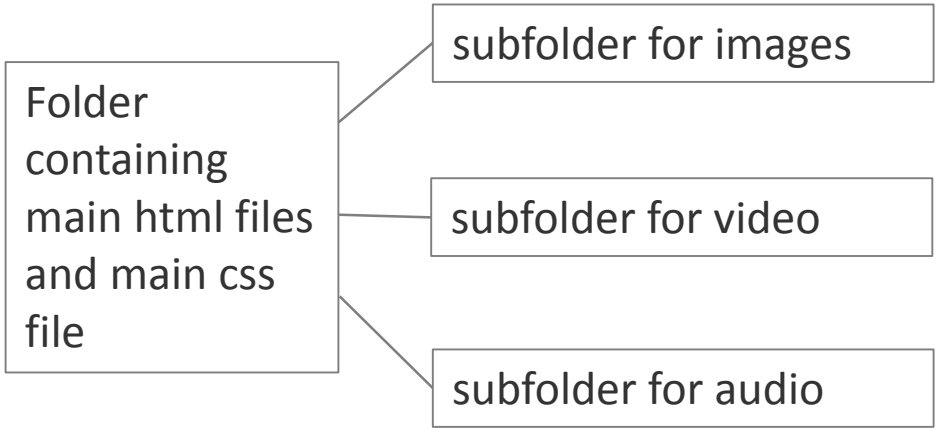




Chapman and Chapman, 2006

4.2 URL structure

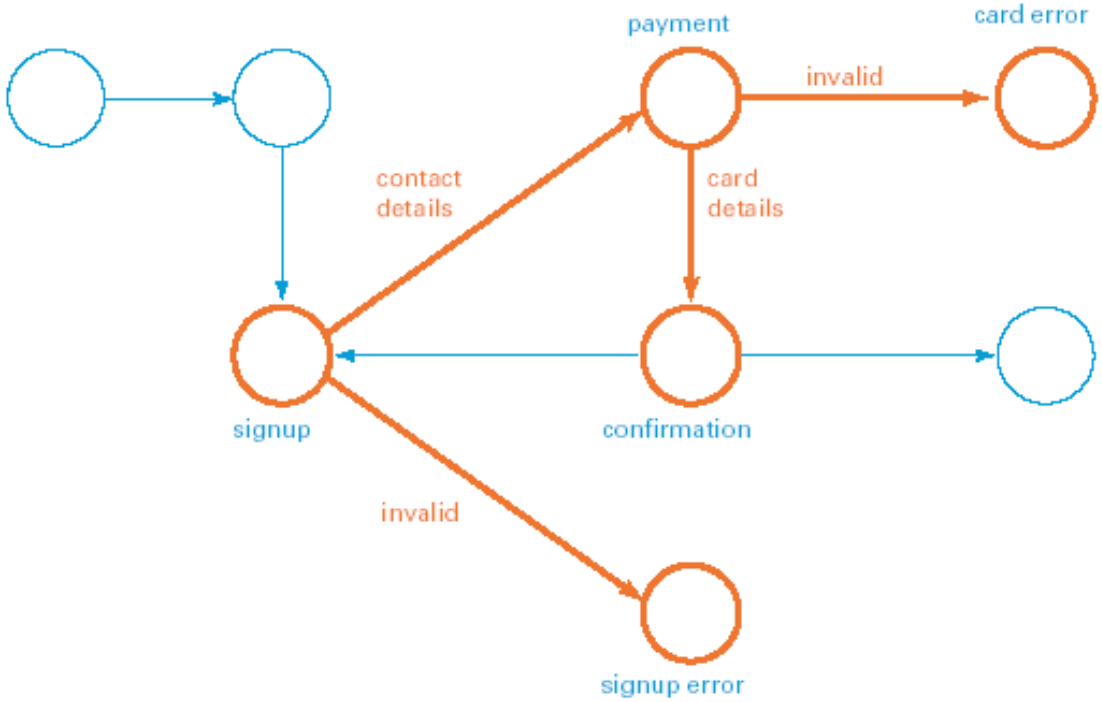
- Relationships between URLs of pages
- Reflects the way pages are stored on server
- Choosing URLs that do not alter over time is necessary to avoid bookmarks and links becoming invalid
- Design for maintenance



4.3 Navigational structure

Chapman and Chapman, 2006

- Connections between pages
- The navigational structure of the Web can be modelled as a directed graph
  - nodes represent pages - states of the browser
  - links represent HTTP requests



Additional transitions caused by erroneous input

- Example: paying for goods at Web site
  - (often accompanied by a roadmap to orient user)

5. Accessibility

- Assistive technologies provide alternative forms of input and output for people who cannot use the conventional mouse, keyboard and screen

	Typical conditions	**Problems with Web access**	**Assistive technology**
Vision	Blindness, low vision, colour defects	Extreme difficulties with seeing and reading, …	Screen readers, braille displays, screen magnifiers, browser options, …
Hearing	Deafness	Any sound information	Signing avatars
Movement	Repetitive strain injuries, limb injuries, …	Inability to use pointing devices and/or keyboard	Alternative devices to simulate keyboard input, voice input
Cognition	Dyslexia, attention deficit disorder, lack of sleep, …	Text difficulties, concentration, …	Screen readers
Age-related	Presbyopia, coordination, memory loss	Small text, selection, orientation	Browser option to increase text size

Chapman and Chapman, 2006

5.1 Technology

- Screen magnifiers mean only part of a page is displayed
  - Compare with mobile screens and zoom?
- Screen readers can only use the `alt` attribute for an image
  - Is a page understandable without images?
- RSI sufferers may not be able to use a mouse
  - "Blackberry thumb", "iPad shoulder"

Prank gift box,
http://www.prankpack.com/buy/iarm-prank-pack-fake-gift-box-3370.html

5.2 Legal requirements / standards / codes of practice

- In some countries there are legal requirements to make Web sites accessible, e.g. Australia
- UK: "The Equality Act 2010 does not refer explicitly to website accessibility, but makes it illegal to discriminate against people with disabilities." (https://en.wikipedia.org/wiki/Web_accessibility)
- Dec 2010: BSI (British Standards Institute) released the standard BS 8878:2010 Web accessibility. *Code of practice*.
  - Guidance on how to meet requirements of The Equality Act 2010 (http://www.bsigroup.com/bs8878)
- W3C's Web Accessibility Initiative develops guidelines for maximizing accessibility (WCAG – web content accessibility guidelines)
- RNIB: "…the RNIB Surf Right standard" [which is similar to WCAG 2.0 AA] (http://www.rnib.org.uk/about-rnib/web-accessibility-statement)

5.3 W3C Web Content Accessibility Guidelines

- The W3C's Web Accessibility Initiative develops guidelines for maximizing accessibility
- "The WCAG documents explain how to make web content more accessible to people with disabilities."

(www.w3.org/WAI/intro/wcag)

- WCAG 2:
  4 principles;
  12 guidelines

Perceivable

- Provide **text alternatives** for non-text content.
- Provide **captions and other alternatives** for multimedia.
- Create content that can be **presented in different ways**, including by assistive technologies, without losing meaning.
- Make it easier for users to **see and hear content**.

Operable

- Make all functionality available from a **keyboard**.
- Give users **enough time** to read and use content.
- Do not use content that causes **seizures**.
- Help users **navigate and find content**.

Understandable

- Make text **readable and understandable**.
- Make content appear and operate in **predictable** ways.
- Help users **avoid and correct mistakes**.

Robust

- Maximize **compatibility** with current and future user tools.

www.w3.org/WAI/WCAG20/glance/

5.3 W3C Web Content Accessibility Guidelines

- **Example: Text Alternatives:**
  - "Guideline 1.1: Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language"
    (http://www.w3.org/WAI/WCAG20/quickref/#text-equiv)
- More specific: (http://www.w3.org/TR/2010/NOTE-WCAG20-TECHS-20101014/H37.html)
  - H37: Using `alt` attributes on `img` elements:
  - An image on a Website provides a link to a free newsletter.

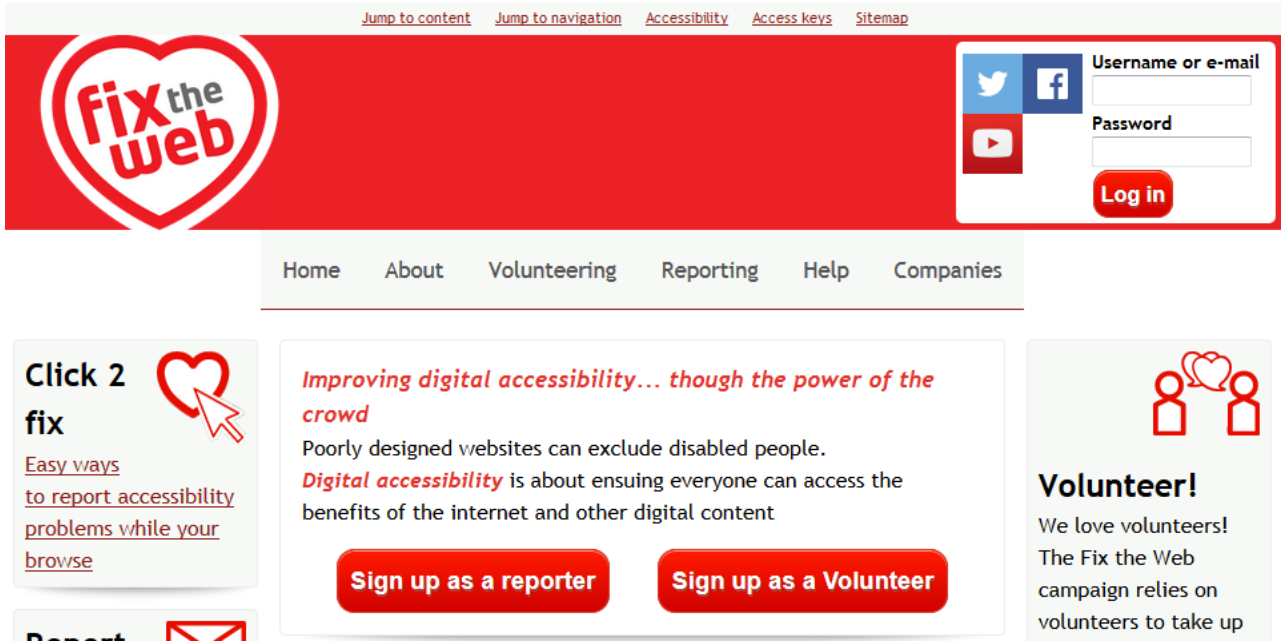
```
<img src="newsletter.gif" alt="Free newsletter. Get
free recipes, news, and more. Learn more." />
```

- RNIB: ".. use *alt text* where an image conveys essential information for the meaning of the page...Where an image is purely decorative we don't add alt text as this is superfluous information, and extra 'noise' that someone using a screenreader ..."

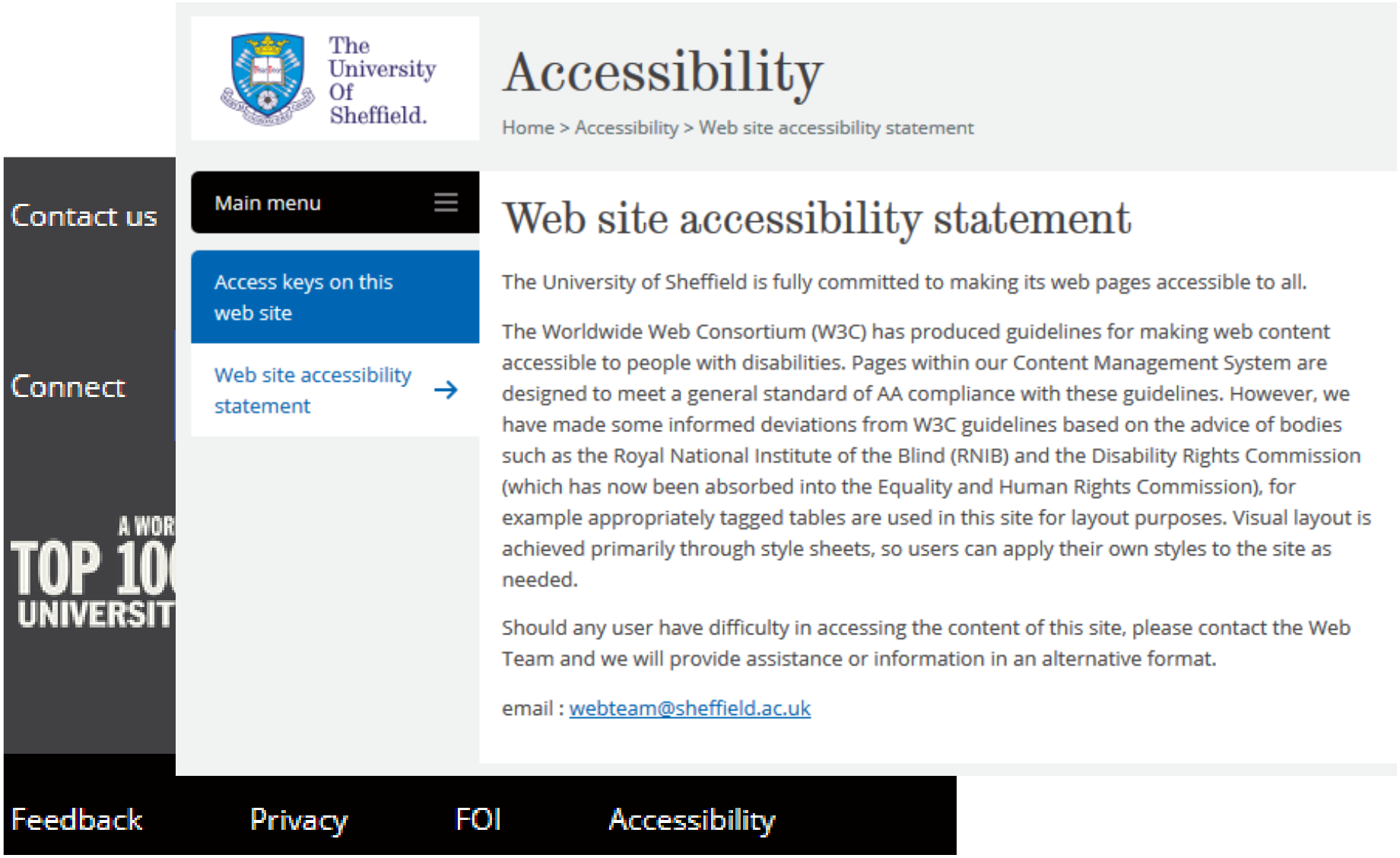
5.4 More on accessibility

- W3C list of Web accessibility evaluation tools:
  - "software programs or online services that *help* determine if a Web site meets accessibility guidelines" (http://www.w3.org/WAI/RC/tools/)

- http://www.fixtheweb.net

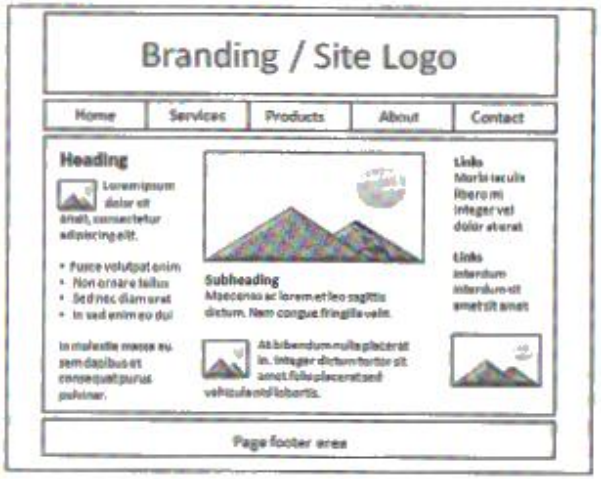


5.5 University's accessibility statement



6. Wireframes

- A sketch or blueprint – structure of basic page elements (not detailed design) (http://en.wikipedia.org/wiki/Website_wireframe)
- Basis for communication amongst project members
  - functionality, behaviour, priority of content
- Tools: Balsamiq Mockups, Mockingbird, Mockflow, etc.

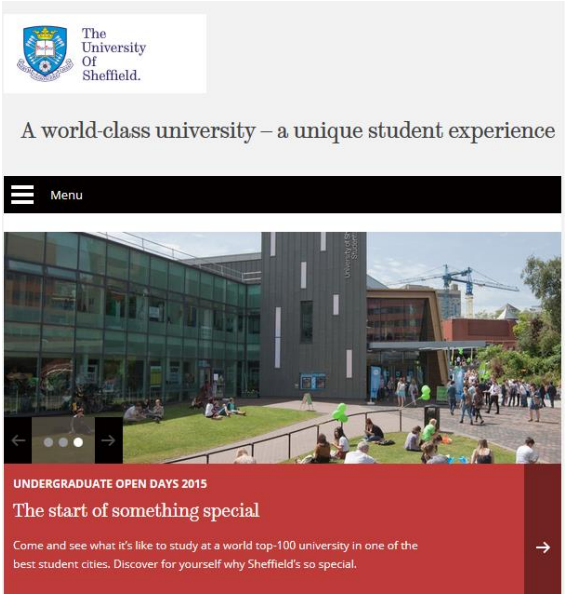


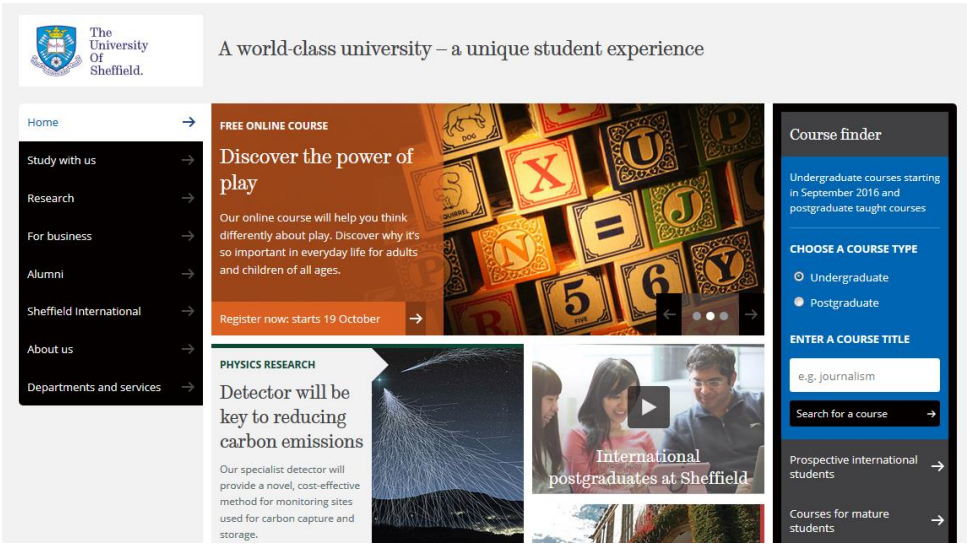
Balsamiq

Felke-Morris, Web Development and Design Foundations with XHTML, Pearson, 2010
Web site: http://webdevfoundations.net/

7. Home page

- Is the home page ‘special’ in some way
- Often different to other pages, e.g. a ‘splash’ page





Requirements

Planning

Design

- Wireframes
- Page mockups
- Design for target audience

Development

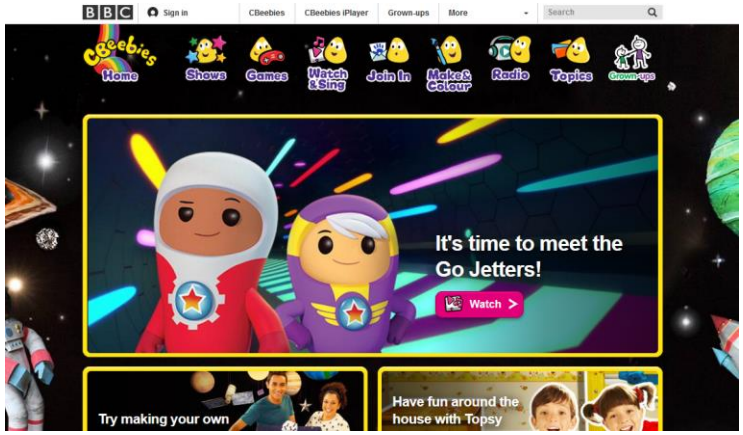
Testing

Delivery

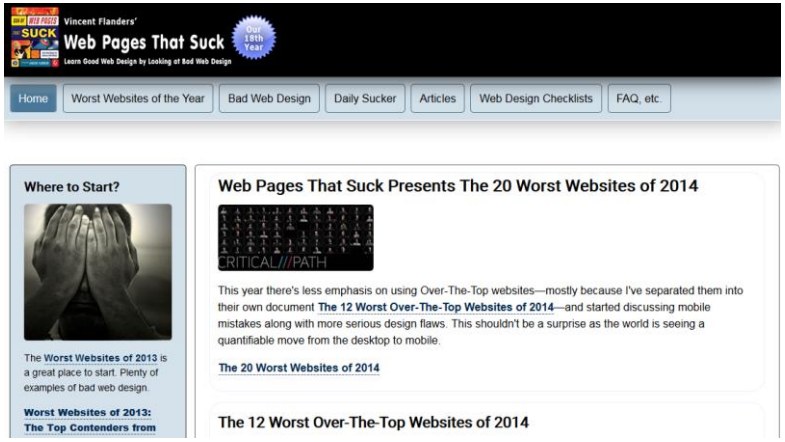
Maintenance

8. Design

- Look-and-feel
  - Colours, shapes, layouts, typefaces, dynamic behaviour, etc.
  - The target audience can help guide the Web page look-and-feel
- Use of design experience
  - Use general design experience for other media, e.g. magazines
  - Web design inspiration websites: http://mashable.com/2013/10/09/web-design-inspiration-2
  - Bad design examples: www.webpagesthatsuck.com →
  - Discussions of best practice: http://webdevfoundations.net/6e/chapter5.html



http://www.bbc.co.uk/cbeebies/



8.1 Photoshop mock-up

- Mock-ups can be used to test ideas out
- Develop page using digital imaging software (e.g. Adobe Photoshop)
- Examples: http://sixrevisions.com/photoshop/25-web-design-layout-tutorials/
- Then convert to HTML and CSS

http://css-tricks.com/video-screencasts/1-converting-a-photoshop-mockup-part-1-of-3/

8.2 Principles

Repetition	Repeat visual elements to help unify a design
Contrast	Good contrast between background colour and text
Proximity	Group related items, and provide adequate separation between unrelated items
Alignment	Align elements to create visual unity

Felke-Morris, Web Development and Design Foundations with XHTML, Pearson, 2010
Web site: http://webdevfoundations.net/

The effect of varying the vertical space between paragraphs
(Chapman and Chapman, 2006)

Use of dummy text:
"In publishing and graphic design, lorem ipsum is placeholder text (filler text) ..."
http://en.wikipedia.org/wiki/Lorem_ipsum

8.2 Principles

Repetition	Repeat visual elements to help unify a design
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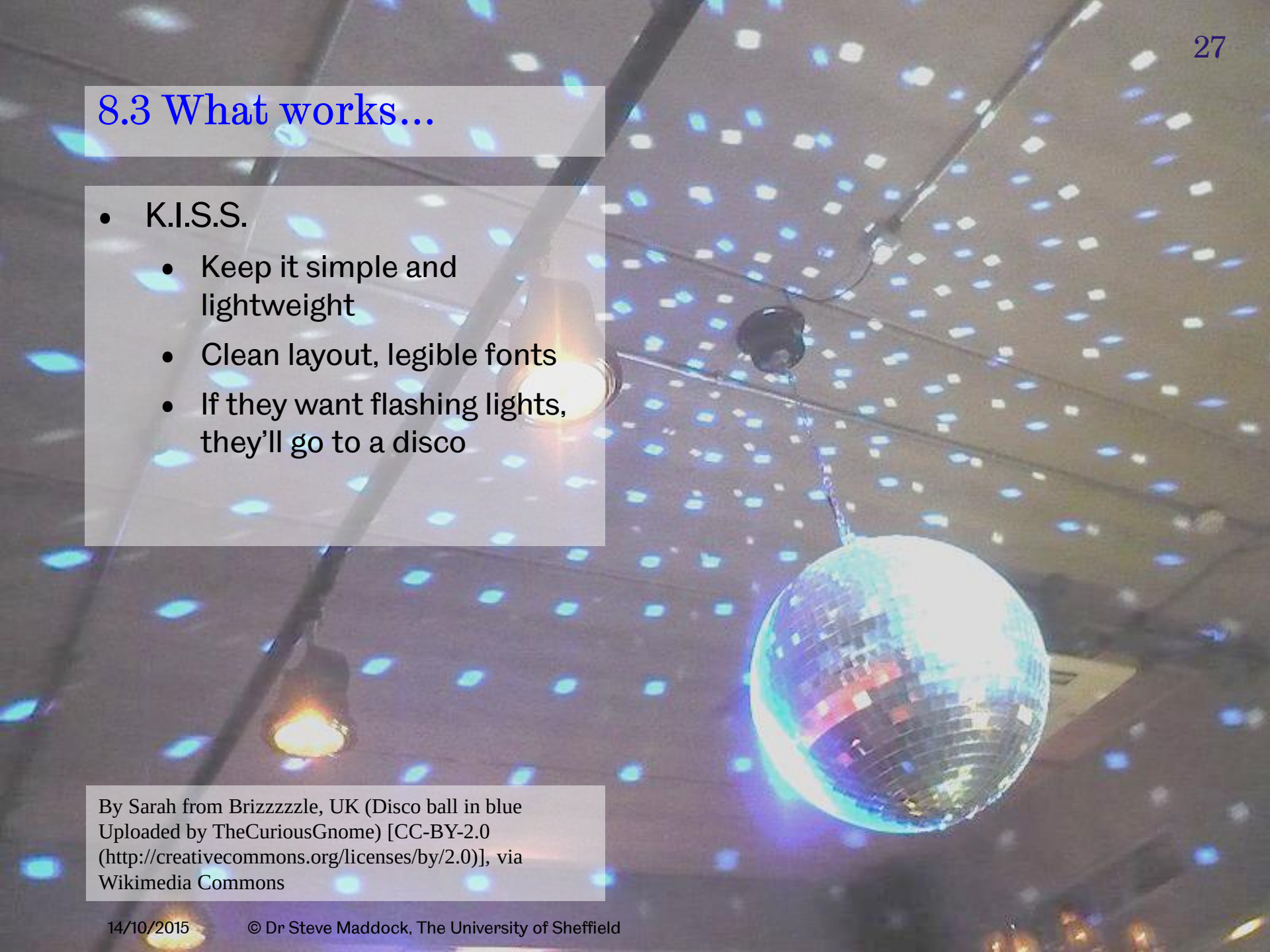
Felke-Morris, Web Development and Design Foundations with XHTML, Pearson, 2010
Web site: http://webdevfoundations.net/

http://en.wikipedia.org/wiki/Grid_%28graphic_design%29

http://sixrevisions.com/web_design/a-brief-look-at-grid-based-layouts-in-web-design/

8.3 What works…

- K.I.S.S.
  - Keep it simple and lightweight
  - Clean layout, legible fonts
  - If they want flashing lights, they'll go to a disco



Review, design, build, repeat (Marcotte, 2014)

Requirements

Planning

Design

Development / Implementation

- HTML templates and CSS (using RWD)
- JavaScript
- Practical considerations: optimisation
- Fallback strategies: new features, legacy browsers
- Debugging: W3C tools – HTML and CSS validation; Browser specific tools, e.g. Firefox Web developer tools

Testing

Delivery

Maintenance

Marcotte, E., Responsive Web Design, 2nd edition, A Book Apart, 2014

9.1 Practical considerations

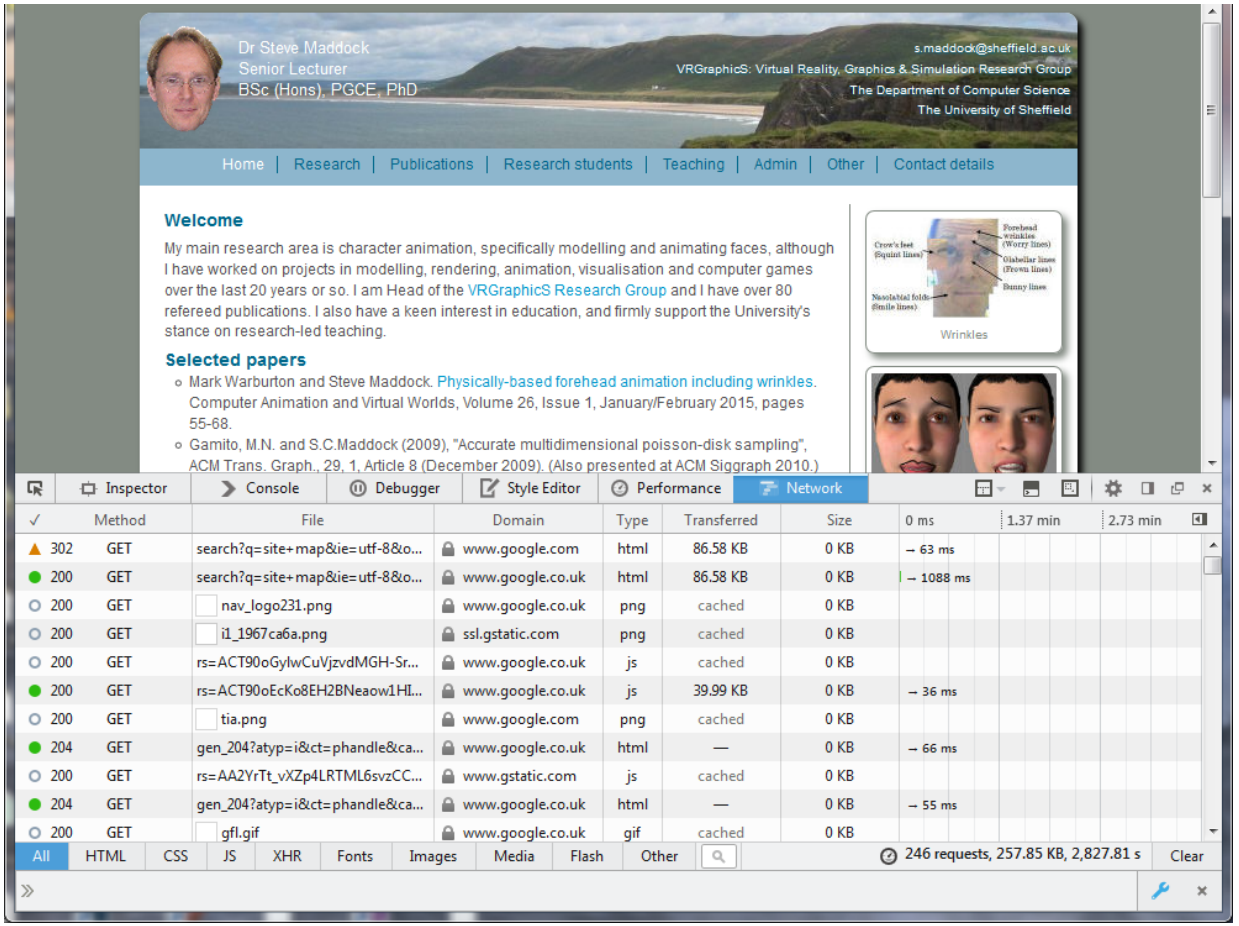
http://www.gimp.org

- Optimise file size to improve load times
  - E.g. Image files – create smaller versions
  - (See https://developers.google.com/web/fundamentals/performance/optimizing-content-efficiency/image-optimization#selecting-the-right-image-format)
  - Tools to compress images: http://www.creativebloq.com/design/image-compression-tools-1132865

Chapman and Chapman, 2006

9.1 Practical considerations

- Firefox Web Developer tools, 'Network' option:



Requirements

Planning

Design

Development

Testing

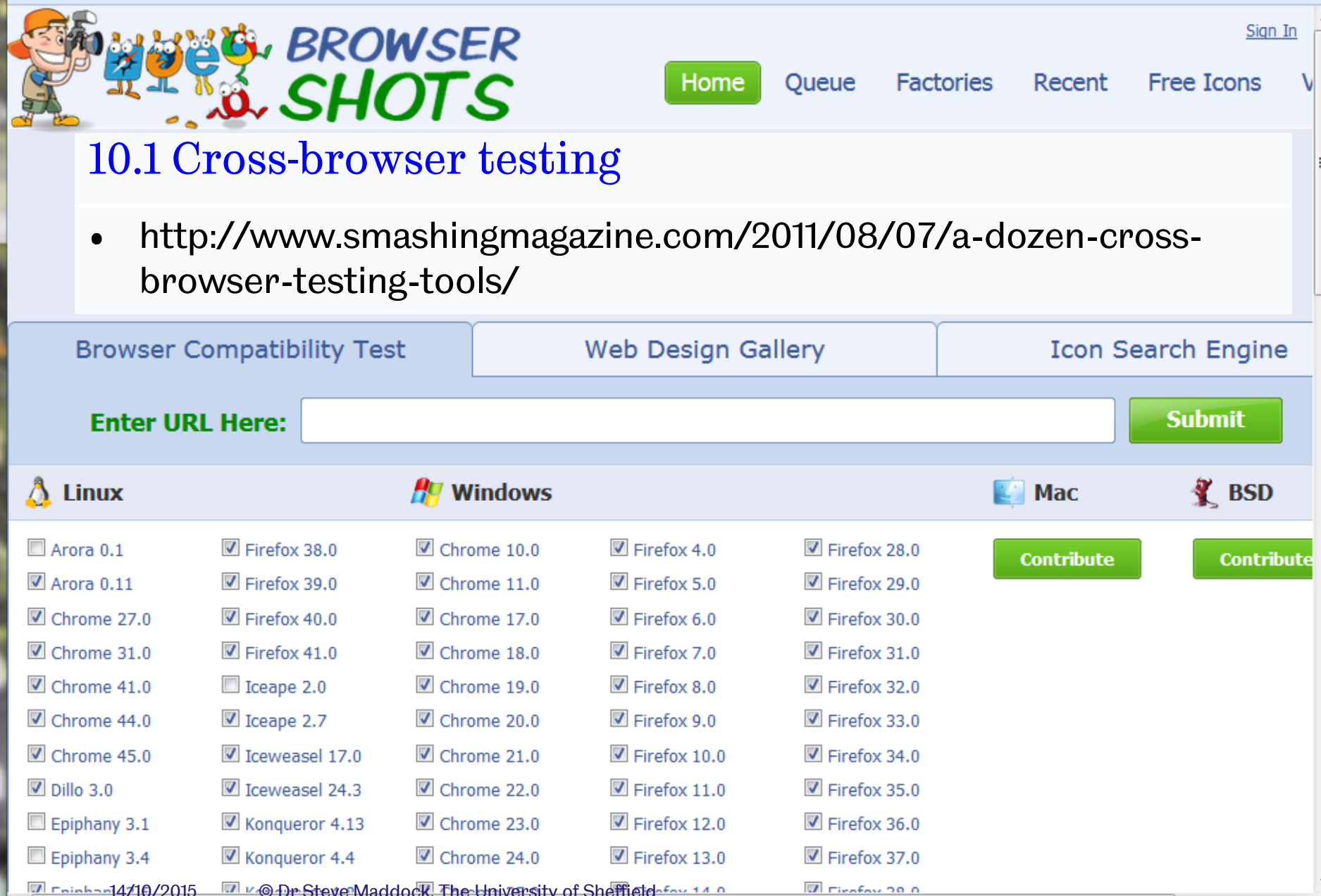
- Turn off features: Images, Style sheet, JavaScript
- Validation: W3C HTML and CSS validators
- Performance testing: page load times
- Different browsers; Different devices
- Accessibility
- Testing usability with real users

Delivery

Maintenance

10.1 Cross-browser testing

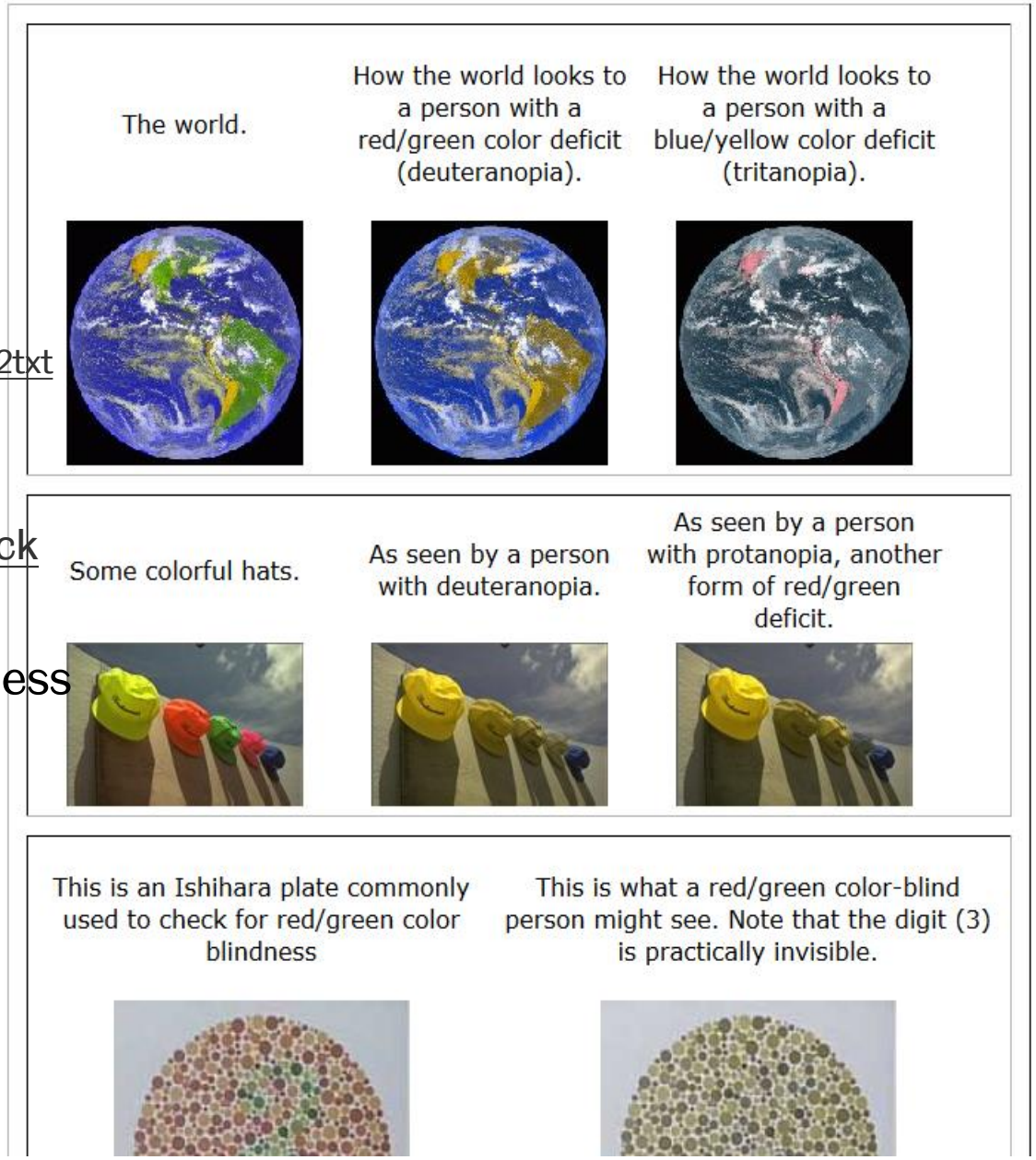
- http://www.smashingmagazine.com/2011/08/07/a-dozen-cross-browser-testing-tools/



10.2 Accessibility

Examples:

- html2txt
  http://www.w3.org/services/html2txt
- Simulator for colour blindness:
  www.vischeck.com/vischeck
- males more prone to red-green colour blindness than females



Requirements

Planning

Design

Development

Testing

Delivery

- ftp to upload to server
- Doman name registration, Web hosting service
- Search Engine Optimisation (SEO)

Maintenance

- ...and ongoing support, e.g. new content

9. Summary

- Establish client's needs
- Establish content
- Consider structures
- Use mock-ups
- Use templates
- (Use Responsive Web Design – mobile first and progressive enhancement)
- Test regularly
- Consider accessibility and usability at all stages

Review, design, build, repeat (Marcotte, 2014)

The "extreme" versions of the new website design
Building A Better Responsive Website by Jeremy Girard
http://www.smashingmagazine.com/2013/03/building-a-better-responsive-website/

Appendix A. A search box

- Search facility


```
<div id="search">
  <form method="get" action="http://www.google.com/search">
  <input type="text"   name="q" size="31" maxlength="255" value="" />
  <input type="submit" value="Google Search" /><br />
  <input type="radio" name="sitesearch" value="" />The Web
  <input type="radio" name="sitesearch"
     value="staffwww.dcs.shef.ac.uk/people/S.Maddock" checked />
     Local search<br />
  </form>
</div>
```

Appendix B. Accessibility

B.1 The title attribute for an anchor element

- Additional information about links can be added using the title attribute of the anchor element

```
<a href="http://www.shef.ac.uk/dcs/" title="Department
of Computer Science">DCS</a>
```

- When the user hovers over the item, the text in the title attribute will appear in a box

A.2 Access keys

- Use of keyboard to allow user to jump to a specific part of the web page
  - Pointing device not needed
- Accessibility statement should include a list of available keys and their function
  - Example: University pages:

Use of standard access key mappings

As of 2004, a standard emerged using numbers, which promotes consiste
different sites. These include, for example, 1 to go to the homepage, 4 for
popular sites such as ft.com and bbc.co.uk , as well as being built into pc

UK Government recommendation for access keys

- S - Skip navigation
- 1 - Home page
- 2 - What's new
- 3 - Site map
- 4 - Search
- 5 - Frequently Asked Questions (FAQ)
- 6 - Help
- 7 - Complaints procedure
- 8 - Terms and conditions
- 9 - Feedback form
- 0 - Access key details

http://en.wikipedia.org/wiki/Access_key