# Responsive Design

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# How mobile-ready are corporate websites?

- "Only 20% FTSE 100 corporate sites have mobile optimised content"
  - Nicola Thompson, Head of standards services, Magus, July, 2012
    - http://slidesha.re/ZdyLjI
- UK companies not ready for mobile internet
  - Two-thirds of companies in the FTSE 100 have websites that are difficult to use on smartphones, a study shows.
  - Robert Cookson, Financial Times, 2 January 2013
    - http://on.ft.com/Zp4UZI
    - "FTSE 100 companies are not mobile-ready and are wasting millions of pounds on internet advertising by sending visitors to websites that do not work as users expect them to," said Jonathan Bass of Incentivated
    - Domino's Pizza, one of the pioneers of online fast-food sales in the UK, reported in September that purchases from mobile phones were growing at almost 50 per cent a year and accounted for nearly a fifth of its online sales.

# It's only going to get worse...

- Increasing variety of devices
  - Desktop, mobile, tablets, connected TVs
  - Regular and ultra high resolution displays
- Coming soon
  - Multi-screen applications
    - In the living room and in the office
  - Cars
    - Dashboard displays, smart phones, heads up displays, multimodal interaction, and concerns over ensuring driver safety
  - Wearable devices
    - Smart watches and glasses
    - Sports and healthcare

# Okay, what do I need to do?

- Take the context of use into account when designing applications and services, e.g.
  - Use a layout and user interface that works effectively for each device
  - Avoid sending images with inappropriate resolutions
  - Try to use the same web page URI for all devices
    - Simpler for users, but requires responsive design
- Some general principles are given in
  - W3C Mobile Web Best Practices 1.0
    - http://www.w3.org/TR/mobile-bp/
  - Online training from the W3C

# What device?

- Server-side detection of device type
  - Based upon information sent in HTTP requests
- Client-side detection
  - In markup, e.g.
    - HTML5 link element for matching style sheet to the device
    - Image srcset attribute
  - In Stylesheets with @media and srcset
  - In Scripts, e.g.
    - Based on user-agent *(risky)*
    - Better is to use capability specific tests
    - Often embedded in libraries, e.g. jQueryMobile
- Using a mix of techniques for flexibility, e.g.
  - Service side adaptation of content
  - Client side adaptation of style

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# Server-side adaptation

- Using user-agent and other HTTP headers
  - e.g. Mobile Detect, a lightweight PHP class
    - http://code.google.com/p/php-mobile-detect/
- Device Description Repositories
  - e.g. WURFL, Device Atlas or Morfeo
- Can't tell if user is on WiFi or Mobile connection
  - However, a client-side API is under development by the W3C Device APIs Working Group
    - http://www.w3.org/TR/netinfo-api/

# Images

- Prescale images to suit different devices
  - Desktop, smart phone, tablet, retinal display, ...
- Client-side scaling of images
  - Blurred/jaggy when scaling up
  - Waste of battery and longer download times when scaling down

# Images and srcset

- Originates in Responsive Images CG
  - Our goal is a markup-based means of delivering alternate image sources based on device capabilities, to prevent wasted bandwidth and optimize display for both screen and print.
  - http://www.w3.org/community/respimg/

- Now a HTML WG working draft
  - srcset attribute on HTML img element
    - Set of image URIs for different kinds of displays

    ```
    <h1><img alt="The Breakfast Combo"
        src="banner.jpeg"
        srcset="banner-HD.jpeg 2x, banner-phone.jpeg 100w,
        banner-phone-HD.jpeg 100w 2x"></h1>
    ```
  - http://www.w3.org/html/wg/drafts/srcset/w3c-srcset/

- And under consideration for CSS too with an implementation in webkit
  - http://dev.w3.org/csswg/css4-images/#image-set-notation

# Responsive Styling

- CSS media queries
  - Use in HTML link element to reference different style sheets according to context of use, e.g.
    - <link rel="stylesheet" type="text/css" media="screen and (max-device-width: 480px)" href="shetland.css">
    - W3C Recommendation 19 June 2012
      - http://www.w3.org/TR/css3-mediaqueries/
      - Widely supported by most modern browsers
  - Ethan Marcotte's article 25 May 2010
    - "Rather than quarantining our content into disparate, device-specific experiences, we can use media queries to progressively enhance our work within different viewing contexts."
      - http://alistapart.com/article/responsive-web-design

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# Client-side scripting

- Scripting can be used to adapt layout, styling and behavior
  - Desktop with windows, icons, and mouse pointers
    - Overlapping windows, tabs and crowded page designs
  - Smart phone with touch gestures
    - Typically single column layout
    - Each control must be large enough for finger control
- Libraries can be used to simplify authoring
  - jQueryMobile and Gallery
    - Built upon jQuery and jQuery UI foundations
- Content adaptation may be better done on the server
  - Avoiding long download times and overly complex pages on a mobile where context of use dictates a narrower set of aims

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# Authoring for multiple contexts of use

- This is challenging!

  - Lots of guidelines and lots to learn!

- UI design tools can help you mockup and review designs, e.g.

  - http://www.foreui.com/
  - But you still have to do this across all of your target platforms

- The future is promising

  - Collaborative expert system that leaves you in control, and takes care of the tedious error prone work of ensuring that any changes you make are consistently applied across all the target platforms in your project

  - Starting from domain interface definition and task models

    - W3C Model-Based UI Working Group
      - http://www.w3.org/2011/mbui/
    - EU Serenoa Project and Quill browser based authoring tool
      - http://www.serenoa-fp7.eu/
    - Contact Dave Raggett <dsr@w3.org> for details

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# Learn More

- W3C Online Training for Web Developers
  - Upcoming courses
    - W3C HTML5 training
    - Mobile Web 1: Best Practices
    - Mobile Web 2: Programming Applications
    - Buenas Prácticas en Web Móvil
  - Find out more at:
    - http://www.w3devcampus.com/
- Online documentation and tutorials
  - There are many sites with helpful information, e.g.
    - http://www.w3.org/2013/02/mobile-web-app-state/
    - http://www.webplatform.org/
- For the W3C activities and specifications
  - http://www.w3.org/

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