Client side web programming

Responsive Design & HTML5

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Responsive design: Some rules

- A good mobile experience requires a different design than the desktop.
- Start from mobile,
  - create **a mobile first design**,
  - then take performance seriously,
  - use Javascript to add in additional content, and
  - always use fluid layouts.
- This isn't mobile Web design or desktop Web design, it's responsive Web design.

http://www.uie.com/articles/strategy_for_responsive_design

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Devising a Strategy for Responsive Design

The Core Tactics: 1. Discovering the breakpoints.

- These are the page widths that will cause design elements to re-order.
  In between breakpoints, items will change their size or flow.
- A responsive design can have multiple breakpoints:
  - for a small-screen phone,
  - a large-screen phone,
  - a tablet,
  - a laptop/desktop.
- By letting the content and navigation drive the breakpoints, teams find they can often get away with fewer screen configurations. (high-resolution Retina iPad & laptop display, lower resolution tablets might just need a little adjustment to that same configuration).

http://www.uie.com/articles/strategy_for_responsive_design

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The Core Tactics 2 & 3

2. Keeping page load times low.
   - Smart placement of media queries and progressive enhancement can dramatically reduce the footprint of the CSS file on smaller, slower devices.
3. Image size optimization.
   - Right now, this is the hardest core tactic to get under control, because there are no solid best practices to follow.
   - Retina and other high-resolution technologies create a problem for teams, because they need large images to look good, but those same images are slow to load on lower resolution screens.

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Mobile First

- Luke Wroblewski: "*What's the minimum amount of content and navigation that we need to make our design useful?*
- The guiding principle of Mobile First is that it's easier to add to a design than to take away. By starting with a minimum configuration, you can then add in more as you gain more space from larger screens and resolutions.
- It's possible that there are things in your current design that don't need to be in any responsive configuration, because they really aren't useful to the user.

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Research First

- Does the team truly understand who their users are? Do they know what those users will need from their design?
- Field research, analytics, and other study methods to understand
  which functions are important and which are nice-to-have.
- A set of scenarios

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Shifting Information to Interaction

- Having a lot of screen real estate gives the designer leeway, especially when it comes to flatting out the information displayed.
- A strategy for creating interactions where information once laid flat:
  - Using an interactive interface, users can directly manipulate filters to drill into the data they need.
- Site navigation:
  - from mega-menus
  - to thoughtfully interactive.
- Smaller screens beg for data to be a starting point of interactions,
  - with obvious touch actions for the most important functions
  - subtle gestures for shortcuts.

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WURFL, the Wireless Universal Resource FiLe

- WURFL is a Device Description Repository (DDR),
- a software component that maps HTTP Request headers to the profile of the HTTP client (Desktop, Mobile Device, Tablet, etc.) that issued the request
- wurfl.xml file (i.e. the repository) contains that definition of thousands of devices
- WURFL Cloud is available at varying prices, also a free Cloud
- WURFL APIs for all major platforms (PHP, Java, .net, C++ and more)

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CSS and media query

```
<meta name="viewport"
content="width=device-width, initial-scale=1">

@media (query)
        {
        /* CSS Rules used when query matches */
        }
@media (min-width: 500px) and (max-width:
600px)
```

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Web Accessibility Initiative WAI

- http://www.w3.org/WAI/
- Web Content Accessibility Guidelines (WCAG) 2.0
- Designing for Inclusion design for all
- legislation requirements, see i.e. http://www.intermin.fi/fi/kehittamishankkeet/maahanmuutto_2020

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Web Content Accessibility Guidelines 2.0

- avoid Flash and PDF
- Canvas might not show for screen readers
- Provide text alternatives for any non-text content
- Time-based Media: Provide alternatives for time-based media; audio and video
- Adaptable: Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

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Web Content Accessibility Guidelines

- Distinguishable: Make it easier for users to see and hear content including separating foreground from background.
- Keyboard Accessible
- Enough Time: Provide users enough time to read and use content.
- Seizures: Do not design content in a way that is known to cause seizures.
- Navigable
- Make text content **readable** and understandable.
- Make Web pages appear and operate in **predictable** ways.
- Input Assistance: Help users avoid and correct mistakes.
- Compatible: Maximize compatibility with current and future user agents, including assistive technologies

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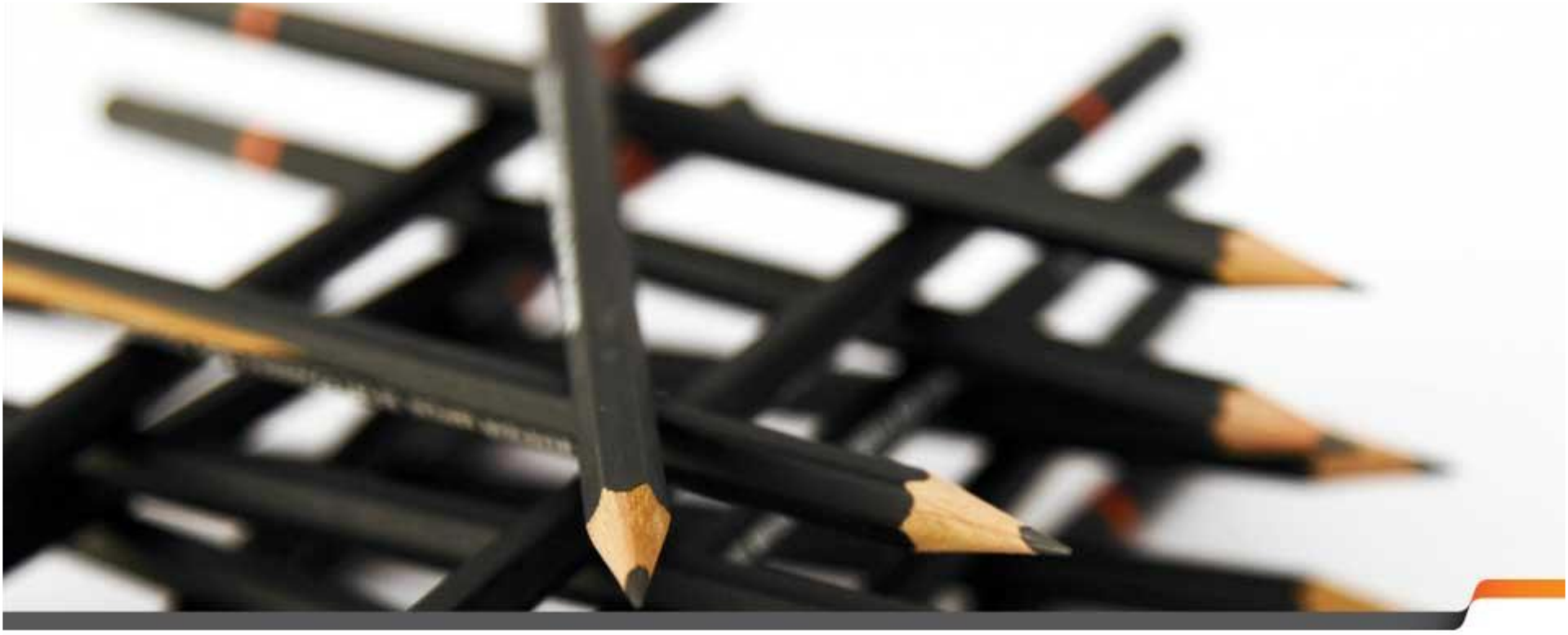

HTML5 features

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Audio and video

- Video formats:
  - H.264 or MPEG-4 in Apple products (incl. Safari)
  - Ogg: open source, free, see xiph.org
    - Firefogg.org converts into ogg
  - WebM
- Only Chrome supports all three

```
<div style="text-align:center" id="video1">
<video controls width="420" height="150">
    <source src="fish.mp4" type="video/mp4">
    <source src="fish.ogg" type="video/ogg">
    <source src="fish.webm" type="video/webm">
    Your browser does not support HTML5 video.
  </video>
</div>
```

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Audio and video

- Audio formats:
  - mp3
  - Ogg or oga
  - wav

```
<div style="text-align:center">
<audio controls id="audio1">
    <source src="bird1.mp3" type="audio/mpeg">
    <source src="bird1.oga" type="audio/ogg">
    <source src="bird1.wav" type="video/wav">
    Your browser does not support the audio element.
  </video>
</div>
```

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Geolocation

The geolocation object

- The geolocation API is published through a geolocation child object within the navigator object. If the object exists, geolocation services are available

```
if ("geolocation" in navigator) {
  /* geolocation is available */
} else {
  alert("I'm sorry, but geolocation services are not supported by your browser.");
}
```

- https://developer.mozilla.org/en-US/docs/Using_geolocation
- http://dev.w3.org/geo/api/spec-source.html

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Getting the current position

To obtain the user's current location:

- call the getCurrentPosition() method.
- This initiates an asynchronous request to detect the user's position, and queries the positioning hardware to get up-to-date information.
- When the position is determined, a specified callback routine is executed.
- You can optionally provide a second callback to be executed if an error occurs. A third, optional, parameter is an options interface where you can set the maximum age of the position returned and the time to wait for a request.

```
navigator.geolocation.getCurrentPosition(function(position) {
  do_something(position.coords.latitude, position.coords.longitude);
});
```

The above example will cause the do_something() function to execute when the location is obtained.

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A location-aware web page 1

```
<!DOCTYPE html>
<html>
<body>
<p id="demo">Click the button to get your coordinates:</p>
<button onclick="getLocation()">Try It</button>
<script>
var x=document.getElementById("demo");
function getLocation()
  {
  if (navigator.geolocation)
    {
    navigator.geolocation.getCurrentPosition(showPosition);
    }
  else{x.innerHTML="Geolocation is not supported by this browser.";}
  }
function showPosition(position)
  {
  x.innerHTML="Latitude: " + position.coords.latitude +
  "<br>Longitude: " + position.coords.longitude;
  }
</script></body></html>
```

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A location-aware web page 2

```
<!DOCTYPE html>
<html><head><title>Location</title>
<script>
function findYou(){
            navigator.geolocation.getCurrentPosition(showPosition,
            noLocation, {maximumAge:1100000, timeout:30000});
   }
function showPosition(position){
  var latitude = position.coords.latitude;
  var longitude = position.coords.longitude;
  var accuracy = position.coords.accuracy;
  document.getElementById("lat").innerHTML="your latitude is "+ latitude;
  document.getElementById("lon").innerHTML="your longitude is "+ longitude;
  document.getElementById("acc").innerHTML="accurate within "+ accuracy +
"meters";
 }
function noLocation(locationError){
            document.write("Request failed");}

</script> </head>
<body>on the next page
 </body></html>
```

```
<body>
<h2>Your location</h2>
<script>
findYou();
</script>
<p id="lat">Here</p>
<p id="lon">Here</p>
<p id="acc">Here</p>
</body>
</html>
```

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Google map call

Documentation at:
https://developers.google.com/maps/

```
<script src="http://maps.googleapis.com/maps/api/js?sensor=false">
</script>

var position = new google.maps.LatLng(latitude, longitude);

var map=new
google.maps.Map(document.getElementById("map1"),mapOpt);

<body>
<div id="map1" style="width:500px;height:450px;"></div>
</body>
```

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http://jquery.org/ - Javascript library

Adding jQuery to Your Web Pages

- Download the jQuery library from jQuery.com;
  & Include it in your document

```
<head>
<script src="jquery-1.8.3.min.js"></script>
</head>
```

- Include jQuery from a CDN (Content Delivery Network), like Google

```
<head>
<script src="//ajax.googleapis.com/ajax/libs/jquery/1.8.3/jquery.min.js">
</script>
</head>
```

- or Microsoft

```
<head>
<script src="//ajax.aspnetcdn.com/ajax/jQuery/jquery-1.8.3.min.js">
</script></head>
```

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jQuery Syntax

- The jQuery syntax is tailor made for **selecting** HTML elements and perform some **action** on the element(s).
- **$(*selector*).*action*()**
- A $ sign to define/access jQuery
- A (*selector*) to "query (or find)" HTML elements
- Similar to CSS selectors
- A jQuery *action*() to be performed on the element(s)
- Examples:
  $(this).hide() - hides the current element.
  $("p").hide() - hides all <p> elements.
  $(".test").hide() - hides all elements with class="test".
  $("#test").hide() - hides the element with id="test".

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Jquery actions

- Fired by events, such as
  moving a mouse over an element;
  selecting a radio button;
  clicking on an element
- Effects: hide/ show, animate
- Changing contents of the page (DOM)
- jQuery provides several methods for AJAX functionality (server communication)

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