Responsive Web Design in Application Express using HTML5 and CSS3

Shakeeb Rahman
@shakeeb
Principal Member of Technical Staff
Oracle Application Express #orclapex
Shakeeb Rahman

Software Developer

- Intern at Oracle in 2006
- Joined APEX team in 2009
- Projects I have worked on
  - Oracle Store
  - APEX
  - Oracle Cloud
- First talk at NYOUG
Session Overview

- The Web Today
- Mobile Applications in the Enterprise
- Two Approaches
- Responsive Web Design Basics
- Responsive Web Design in APEX 4.2
- Demos
- Is Responsive Right for you?
Evolving Web Applications

10 Years Ago

- Designed for Internet Explorer
- Windows Desktop or Laptop
- Maximum screen resolution of 1024x768
- Table-Based
- `<font>` Tag
- Presentation + Markup mixed
Evolving Web Applications

5 Years Ago

- Mobile becomes popular with iPhone
- Firefox is eating IE marketshare
- Mobile revolution taking place
Evolving Web Applications

Today

- Many Devices
- Many Platforms
- Many Screen sizes
- Many Resolutions
- Many Browsers
- Many Many Variables
Evolving Web Applications

Enterprise gone Mobile

- Mobile is not just for personal use
- Enterprises have embraced mobile
- Agility
- Cost savings
- Improve productivity
“71% of organizations are already using or planning to use custom mobile applications”

Symantec
2012 State of Mobility Survey
Everyone is doing it. How can you?
Native Apps?
Native Apps?
Let’s look at the requirements.
Mobile Application Requirements

- APEX Application
- Support Mobile + Tablet Devices
- Functional across a variety of mobile platforms (iOS, Android, etc)
- Leverage existing APEX skills
Two Approaches
Approach 1:
Dedicated Mobile Web Application
(using jQuery Mobile)
jQuery Mobile Application

- Looks/Feels like Native Mobile App
- Fast, Performant
- Optimized for Mobile
- Compatible with many mobile devices
jQuery Mobile Application

However...

- May require duplicate logic
- Limited functionality
- Lack of tablet support
- Different UI from desktop application
Approach 2:
Responsive Web Application
Responsive Web Application

- One Application
- Desktop, Tablet, and Mobile support
- Similar User Interface
- Single Code Line

Image Source: http://johnpolacek.github.com/scrolldeck.js/decks/responsive/
Responsive Web Design (RWD)
Responsive Web Design (RWD)

an approach to web design in which a designer intends to provide an **optimal viewing experience**—easy reading and navigation with a minimum of resizing, panning, and scrolling—**across a wide range of devices** (from desktop computer monitors to mobile phones). (Wikipedia)
Same HTML. 
Same Application Logic. 
Different User Experience.
Memorable moments, turning points in past debates
From the first televised event in 1960 between John F. Kennedy and Richard Nixon, to the most recent in 2008 between Barack Obama and John McCain.

- Romney-Obama debate guide

Turkey fires artillery into Syria
The action came after shelling from Syria hit a Turkish border town, killing at least five people. 2:15 pm
- Suicide bombings kill dozens in Syria

Winchester man pleads guilty to killing family
Thomas Mortimer IV pleaded guilty to murdering his wife, two children, and mother-in-law in his family's home in 2010.

Valentine says he was undermined by coaches
In an interview on WEEI, Red Sox manager Bobby Valentine said he believed his coaching staff was not loyal this season. 1:28 pm

Developer plans $60m housing complex near JFK T stop
The proposed apartment complex on Morrissey
Turkey fires artillery into Syria

The action came after shelling from Syria hit a Turkish border town, killing at least five people. 2:15 pm

- Suicide bombings kill dozens in Syria

Winchester man pleads guilty to killing family

Thomas Motterer IV pleaded guilty to murdering his wife, two children, and mother-in-law in his family’s home in 2010.

Valentine says he was undermined by coaches

In an interview on WEEI, Red Sox manager Bobby Valentine said he believed his coaching staff was not loyal this season. 1:39 pm

In New Hampshire, Bill Clinton talks up Obama care

The former president endorsed President Obama’s health care plan at a rally at the University of New Hampshire. 36 minutes ago

- Bill Clinton reaches out to Warren supporters

Mitt Romney hasn’t changed a bit

The ultimate shame of the former governor’s presidential campaign is that he looks and sounds like the same man at the end of the day as he did the beginning.

MORE HEADLINES

- FBI offers reward for alleged Methana exonereeator

NEWS METRO ARTS BUSINESS SPORTS OPINION LIFESTYLE MAGAZINE TODAY'S PAPER MY SUBSCRIPTIONS DIGITAL | PDF DELIVERY | LOG IN

In New Hampshire, Bill Clinton talks up Obama care

The former president endorsed President Obama’s health care plan at a rally at the University of New Hampshire. 36 minutes ago

- Bill Clinton reaches out to Warren supporters

Mitt Romney hasn’t changed a bit

The ultimate shame of the former governor’s presidential campaign is that he looks and sounds like the same man at the end of the day as he did the beginning.

MORE HEADLINES

- FBI offers reward for alleged Methana exonereeator

NEWS METRO ARTS BUSINESS SPORTS OPINION LIFESTYLE MAGAZINE TODAY'S PAPER MY SUBSCRIPTIONS DIGITAL | PDF DELIVERY | LOG IN

The Boston Globe

October 3, 2013

In New Hampshire, Bill Clinton talks up Obama care

The former president endorsed President Obama’s health care plan at a rally at the University of New Hampshire. 36 minutes ago

- Bill Clinton reaches out to Warren supporters

Mitt Romney hasn’t changed a bit

The ultimate shame of the former governor’s presidential campaign is that he looks and sounds like the same man at the end of the day as he did the beginning.

MORE HEADLINES

- FBI offers reward for alleged Methana exonereeator

NEWS METRO ARTS BUSINESS SPORTS OPINION LIFESTYLE MAGAZINE TODAY'S PAPER MY SUBSCRIPTIONS DIGITAL | PDF DELIVERY | LOG IN
Turkey fires artillery into Syria

The action came after shelling from Syria hit a Turkish border town, killing at least five people. 2:15 pm

- Suicide bombings kill dozens in Syria

Winchester man pleads guilty to killing family

Latest news

Turkey fires artillery into Syria

The action came after shelling from Syria hit a Turkish border town, killing at least five people. 2:15 pm

- Suicide bombings kill dozens in Syria
Larry Ellison tells why Oracle Cloud is the enterprise choice.

Transform your business with Oracle Cloud

Plan Effectively
Streamline your enterprise business processes

- Enterprise Resource Planning
- Planning and Budgeting

Empower People
Realize the power of your employees

- Human Capital Management
- Talent Management

Boost Sales
Maximize revenues and engage customers

- Sales and Marketing
<table>
<thead>
<tr>
<th>Database</th>
<th>Price</th>
<th>Storage Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>S5</td>
<td>$175/M</td>
<td>1 Schema, 5 GB, 20 GB Data Transfer</td>
</tr>
<tr>
<td>S20</td>
<td>$900/M</td>
<td>1 Schema, 20 GB, 120 GB Data Transfer</td>
</tr>
<tr>
<td>S50</td>
<td>$2,000/M</td>
<td>1 Schema, 50 GB, 300 GB Data Transfer</td>
</tr>
</tbody>
</table>

1. Your datatransfer limit is the maximum allowed bytes of data for transfer in and out of your service within your billing month.

- Each license for the Oracle Database Cloud Service includes the limited right to use the following features of the service: RESTful Web Services, Data Loading, SQL Application Development, the SQL Workshop, and Java Development.
- End User may upgrade from a lower edition to a higher edition as any point of time (Downgrading is not allowed).

On-Day Free Trial of the Oracle Database Cloud Service includes the following features:
1 Schema, Oracle Database 11g Release 2, 1 GB Data Storage, 4 GB Data Transfer

---

About Oracle | Contact Us | Legal Notices | Terms of Use | Your Privacy Rights
---|---|---|---|---
Copyright © 2012 Oracle and/or its affiliates. All rights reserved.
How does it work?
CSS3 Media Queries

- allowing you to define styles based on conditions such as screen size or resolution
- most commonly used media queries rely on browser width to determine layout / device type

```css
@media screen and (min-width: 320px) and (max-width: 479px) {...}
```

- define multiple CSS media queries to target “cut off points” and appropriately adjust UI for given screen size
Common CSS3 Media Queries

- **Mobile Portrait**
  - @media screen and (min-width: 320px) and (max-width: 479px)

- **Mobile Landscape**
  - @media only screen and (min-width: 480px) and (max-width: 767px)

- **Mobile Portrait / Landscape**
  - @media only screen and (max-width: 767px)

- **Tablet Portrait**
  - @media only screen and (min-width: 768px) and (max-width: 959px)

- **Tablet Landscape**
  - @media only screen and (min-width: 960px) and (max-width: 1024px)
Grid-Based Layout

- Provides a HTML structure to organize our page components onto a grid
- Using a grid makes it easier to align and lay out page components
- CSS3 media queries can then easily shift or reposition these components
Grid-Based Layout
Grid-Based Layout

**Desktop**
- Header
- Breadcrumb
- Search
- Region 1
- Region 2
- Region 3
- Region 4

**Tablet**
- Header
- Breadcrumb
- Search
- Region 1
- Region 2
- Region 3
- Region 4

**Mobile**
- Header
- Breadcrumb
- Search
- Region 1
- Region 2
Example Grid Layout HTML Markup

```html
1. `<div class="apex_grid_container">
2.     `<div class="apex_row">
3.         `<div class="apex_cols apex_span_6 alpha">
4.             Left Col
5.         </div>
6.         `<div class="apex_cols apex_span_6 omega">
7.             Right Col
8.         </div>
9.     </div>
10. </div>
```
Sounds technical. Do I have to do this manually?
NO!
APEX 4.2 handles all of this for you.
APEX 4.2

- Every release tries to give developers more control over HTML emitted from APEX
- APEX 4.2 has two features that especially enable responsive design
Grid Layout
Grid Layout

- Declarative way to lay out regions and items on a page
- Possible to do complex layouts without manual css overrides
- Compatible with popular grid frameworks such as twitter bootstrap, 960 gs, etc.
Grid Layout

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start New Row</td>
<td>Yes</td>
<td>Position the region in a new row.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Position the region on the same row as the previous region. This is useful when positioning a region to aside another region.</td>
</tr>
<tr>
<td>Column</td>
<td>Automatic</td>
<td>Position the region in a specific grid column. Selecting <strong>Automatic</strong> will automatically use the next available grid column to display the region.</td>
</tr>
<tr>
<td></td>
<td>1-12</td>
<td>Position the region at this specific grid column.</td>
</tr>
<tr>
<td>New Column</td>
<td>Yes</td>
<td>Position this region in the next column in the same row.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Position this region in the same column as the previous region.</td>
</tr>
<tr>
<td>Column Span</td>
<td>Automatic</td>
<td>Determines how many grid columns should be used by the region. Selecting <strong>Automatic</strong> will balance the available grid columns within all regions in the same grid row.</td>
</tr>
<tr>
<td></td>
<td>1-12</td>
<td>Use this specific number of grid columns for this region.</td>
</tr>
</tbody>
</table>
Theme 25

(Responsive, Modernizr Enabled, SCSS-Based, HTML5 + CSS3 Utilizing Theme for APEX 4.2)
Theme 25

- **Fully Responsive**
  - Support for Desktop, Tablet and Mobile Screen Sizes
  - Uses flexible grid layout that can be used on screen sizes from the largest monitors to mobile devices
  - (4.2.1) Interactive Reports are displayed appropriately for smaller screens
  - Form labels shift above when using mobile devices
  - Uses Respond.js to enable media queries for older Internet Explorer versions
Theme 25

- Modernizr Enabled
  - Popular feature detection library is loaded by default so developers can take advantage of HTML5 and CSS3 features while providing fallbacks for older browsers
  - On page load, several classes are added to the HTML tag to show which features are supported by the browser

```html
<html class="js no-flexbox flexbox-legacy canvas canvastext no-webgl no-touch geolocation postmessage websqldatabase no-indexeddb hashchange history draganddrop websockets rgbα hsla multiplebgs backgroundsize borderimage borderradius boxshadow textshadow opacity cssanimations csscolumns cssgradients cssreflections csstransforms csstransforms3d csstransitions fontface generatedcontent video audio localstorage sessionstorage webworkers applicationcache svg inlinesvg smil svgclippaths" lang="en">
```
Theme 25

- **Icon Buttons**
  - Developers can easily create buttons with icons without creating custom templates
  - Simply choose an icon-compatible button template and specify an icon class
High Resolution Display Support

- Support for “Retina Display” devices
- Graphics utilized by the theme are automatically upscaled for devices that utilize ultra high resolution displays to render web content
**Theme 25**

- **Responsive Utility Classes**
  - Easily hide / show content depending on device type

<table>
<thead>
<tr>
<th>Class</th>
<th>Phones 767px and below</th>
<th>Tablets 979px to 768px</th>
<th>Desktops Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>.visible-phone</td>
<td>Visible</td>
<td>Hidden</td>
<td>Hidden</td>
</tr>
<tr>
<td>.visible-tablet</td>
<td>Hidden</td>
<td>Visible</td>
<td>Hidden</td>
</tr>
<tr>
<td>.visible-desktop</td>
<td>Hidden</td>
<td>Hidden</td>
<td>Visible</td>
</tr>
<tr>
<td>.hidden-phone</td>
<td>Hidden</td>
<td>Visible</td>
<td>Visible</td>
</tr>
<tr>
<td>.hidden-tablet</td>
<td>Visible</td>
<td>Hidden</td>
<td>Visible</td>
</tr>
<tr>
<td>.hidden-desktop</td>
<td>Visible</td>
<td></td>
<td>Hidden</td>
</tr>
</tbody>
</table>
When to Develop Responsive Applications

- Responsive design allows you to develop a single application suitable for a variety of devices.
- It does so by re-positioning page components to become more optimal for mobile devices by reducing zooming and panning.
- However, there are some challenges to consider.
When to Develop Responsive Applications

- Developing a responsive application can be time consuming and may require a deep understanding of grid layout, html and css.
- Page size remains the same. You are loading the full HTML, CSS, and JS resources, even on mobile devices with limited broadband.
- Responsive Web Design is just the tip of the iceberg.
Is Responsive Right for you?

**Responsive**
- Developing a single application, one source for application logic, one set of pages
- Similar UI
- Full functionality of the application

**jQuery Mobile**
- Framework especially designed for mobile devices
- Lightweight and faster loading
- Native look and feel
- Use wizards to create page components (more comfortable for APEX developers)
- Easily integrated in PhoneGap to develop Hybrid-Native applications
I DON'T ALWAYS DEVELOP FOR MOBILE

BUT WHEN I DO, I DO IT RESPONSIVELY
Q & A
@shakeeb
blog: apex.shak.us
Hardware and Software
Engineered to Work Together