Working with Javascript: Building Responsive Library apps

Code Samples, Explanations, and Downloads

Jason A. Clark

Head of Digital Access and Web Services

Montana State University Library

jaclark@montana.edu

www.jasonclark.info

twitter.com/jaclark

Tips – Common Javascript App Actions

1. Create markup

2. Call supplementary script

3. Customize javascript

Tips – Calling a Javascript Library

• Call as any other script on page

• Think procedural - request before starting to use script functions

• Use Google Hosted Libraries - Google Developers

<script src="http://ajax.googleapis.com/ajax/libs/jquery/2.0.0/jquery.min.js"></script>

Further Reading

* JavaScript: The Good Parts by Douglas Crockford
http://www.amazon.com/JavaScript-Good-Parts-Douglas-Crockford/dp/0596517742/
* jQuery Cookbook: Solutions & Examples for jQuery Developers by Cody Lindley
http://www.amazon.com/jQuery-Cookbook-Solutions-Examples-Developers/dp/0596159773/
* Ajax: A New Approach to Web Applications by Jesse James Garrett
http://www.adaptivepath.com/publications/essays/archives/000385.php
* Ajax gives software a fresh look (from CNET News)
http://news.cnet.com/Ajax-gives-software-a-fresh-look/2100-1007\_3-5886709.html?

Resources

* XMLHttpRequest & Ajax Based Applications (from Fiftyfoureleven.com)
http://www.fiftyfoureleven.com/resources/programming/xmlhttprequest/
* Foundations of Ajax by Ryan Asleson, Nathaniel T. Schutta
ISBN: 1590595823 http://www.worldcatlibraries.org/wcpa/isbn/1590595823
* Google Hosted Libraries - Google Developers

https://developers.google.com/speed/libraries/

Tutorials

* Javascript - Mozilla Developer Network

 https://developer.mozilla.org/en-US/docs/Web/JavaScript

* W3 Schools - Javascript Tutorials

http://www.w3schools.com/js/default.asp/

* Getting Started with AJAX (from A List Apart)

http://www.alistapart.com/articles/gettingstartedwithajax

* AJAX:Getting Started (from Mozilla Developer Center)

http://developer.mozilla.org/en/docs/AJAX:Getting\_Started

* jQuery Documentation

http://api.jquery.com/

* How jQuery Works

http://learn.jquery.com/about-jquery/how-jquery-works/

Javascript in Libraries Examples

* NCSU Libraries Bento Box Search

 http://www.lib.ncsu.edu/search/?q=laser

* Guesstimate Virginia Tech Libraries
http://addison.vt.edu
* TAMU Geological Atlas of the United States
http://repository.tamu.edu/handle/1969.1/2490
* Plymouth State University Lamson Library Catalog
http://library.plymouth.edu/read/184908
* National Library of Australia Library Labs
http://ll01.nla.gov.au/search.jsp?searchTerm=enigma
* VuFind Demo
http://www.vufind.org/demo/
* NINES
http://www.nines.org/collex
* Project Blacklight
http://blacklight.betech.virginia.edu

Javascript – Sample Applications (Workshop Demos)

<http://www.lib.montana.edu/~jason/files/javascript/>

People @ Your Library (Ajax)

www.lib.montana.edu/~jason/files/javascript/showpeople/

Flickr API - Display Photos (Javascript)

www.lib.montana.edu/~jason/files/api/flickr/

Dynamic Definition List (toggle with jQuery)

www.lib.montana.edu/~jason/files/javascript/togglelist/

Livesearch of a Department/Subject List (jQuery)

www.lib.montana.edu/~jason/files/javascript/livesearch/

Toggle Search Form (Javascript)

www.lib.montana.edu/~jason/files/javascript/togglesearch/

Code Sample #1: People @ the Library - xHTML file to provide content

<h2><a href="mailto:kacoombs@uh.edu">Karen Coombs</a></h2>

<p>Head of Web Services, University of Houston Libraries</p>

<a href="http://librarywebchic.net/wordpress/">http://librarywebchic.net/wordpress/</a>

Code Sample #1: People @ the Library - Explanation

* One of our data files
* Various and sundry factoids about person, some associated urls
* Header and description element to populate the heading and description of the content
* Can pass any xHTML tags or markup - <form>, <ul>, <table>

Code Sample #2: People @ the Library - Web page for user interface and display

…

<div id="container">

<div id="main"><a name="mainContent"></a>

 <h1>People @ Your Library</h1>

 <p class="control"><a href="./" class="refresh">Reset the page</a></p>

 <ul id="people">

 <li id="first"><a href="?person=karen">Karen</a></li>

 <li><a href="?person=jason">Jason</a></li>

 <li><a href="?person=amy">Amy</a></li>

 </ul>

 <div id="details">

 <?php include "people.php"; ?>

 </div>

</div>

<!-- end main div -->

</div>

Code Sample #2: People @ the Library - Explanation

* xHTML that provides interface and gives action to our script
* Notice the query string value (?person=) on <a> tag
* <div id="details"> will be populated with script messages OR new xHTML tags received via our Ajax requests

Code Sample #3: People @ the Library - Using the XMLHttpRequest object

function getHTTPObject() {

  var xhr = false;

  if (window.XMLHttpRequest) {

    xhr = new XMLHttpRequest();

  } else if (window.ActiveXObject) {

    try {

      xhr = new ActiveXObject("Msxml2.XMLHTTP");

    } catch(e) {

      try {

        xhr = new ActiveXObject("Microsoft.XMLHTTP");

      } catch(e) {

        xhr = false;

      }

    }

  }

  return xhr;

}

function grabFile(file) {

  var request = getHTTPObject();

  if (request) {

    displayLoading(document.getElementById("details"));

    request.onreadystatechange = function() {

      parseResponse(request);

    };

    request.open("GET", file, true);

    request.send(null);

    return true;

  } else {

    return false;

  }

}

Code Sample #3: People @ the Library - Explanation

* First part of our javascript
* "getHTTPObject" function creates the XMLHttpRequest object
* Using the if and else statements to check for Web browsers' different implementations of XMLHttpRequest
* "grabFile" function makes request, gives us peek of Document Object Model (DOM) in action using "getElementById" to select piece of page to update
* Relies on two separate functions - a feedback function ("displayLoading") and a load request function ("parseResponse")

Code Sample #4: People @ the Library - Showing feedback to user

 function displayLoading(element) {

  while (element.hasChildNodes()) {

    element.removeChild(element.lastChild);

  }

  var image = document.createElement("img");

  image.setAttribute("src","img/loading.gif");

  image.setAttribute("alt","Loading...");

  element.appendChild(image);

}

function fadeUp(element,red,green,blue) {

  if (element.fade) {

    clearTimeout(element.fade);

  }

  element.style.backgroundColor = "rgb("+red+","+green+","+blue+")";

  if (red == 255 && green == 255 && blue == 255) {

    return;

  }

  var newred = red + Math.ceil((255 - red)/10);

  var newgreen = green + Math.ceil((255 - green)/10);

  var newblue = blue + Math.ceil((255 - blue)/10);

  var repeat = function() {

    fadeUp(element,newred,newgreen,newblue)

  };

  element.fade = setTimeout(repeat,100);

}

Code Sample #4: People @ the Library - Explanation

* The two functions that show visual cues to the user after action
* "displayLoading" shows status messages and images to user
* "fadeUp" highlights where the page update is taking place

Code Sample #5: People @ the Library - Communicating status and loading the response

//checks state of HTTP request and gives brief status note to user

function parseResponse(request) {

  if (request.readyState == 4) {

    if (request.status == 200 || request.status == 304) {

      var details = document.getElementById("details");

      details.innerHTML = request.responseText;

      fadeUp(details,255,255,153);

    }

  }

}

Code Sample #5: People @ the Library - Explanation

* Next part of our javascript
* Displays different messages and cues to the user based on the status of the request on the server
* Uses "innerHTML" and "responseText" to target and write new data into <div id="details">
* Second peek at Document Object Model (DOM) in action using "getElementById"

Code Sample #6: People @ the Library - Set up client side scripting

window.onload = prepareLinks;

function prepareLinks() {

  if (!document.getElementById || !document.getElementsByTagName) {

    return;

  }

  if (!document.getElementById("people")) {

    return;

  }

  var list = document.getElementById("people");

  var links = list.getElementsByTagName("a");

  for (var i=0; i<links.length; i++) {

    links[i].onclick = function() {

      var query = this.getAttribute("href").split("?")[1];

      var url = "people.php?"+query;

      return !grabFile(url);

    };

  }

}

Code Sample #6: People @ the Library - Explanation

* Last part of our javascript - "hijacks" server side scripting
* Earmark and traverse xHTML data elements - <a> and <ul id="people">
* Rewrite it to be used and available for javascript functions such as "onclick"
* More DOM functions like "getElementsByTagName"

Code Sample #7: People @ the Library - CSS (Cascading Style Sheets)

…

/\* =container

----------------------------------------------- \*/

div#container {width:65em;margin:0 auto;background:#fff;}

/\* =main

----------------------------------------------- \*/

div#main {width:63em;margin:0 auto;padding:1em .5em 2em .5em;}

/\* =content

----------------------------------------------- \*/

div#content {width:95%;margin:0 auto;}

#content p.warn {color:red;}

/\* =people

----------------------------------------------- \*/

ul#people {display:inline;}

ul#people li {margin-left:0;padding-left:30px;border:none;list-style:none;display:inline;}

ul#people li#first {margin-left:0;padding-left:0;border:none;}

/\* =details

----------------------------------------------- \*/

div#details {margin-top:30px;}

Code Sample #7: People @ the Library - Explanation

* Part of our CSS file
* Means of passing style rules for different pieces of the Web page
* <div> tags are given specific, relative widths, <ul> and <li> tags are styled to be listed inline

Code Sample #1: Flickr API - Display Photos (Javascript) – The URL Request

**http://api.flickr.com/services/feeds/photos\_public.gne?tags=cil2008&format=json**

Code Sample #1: Flickr API - Display Photos (Javascript) - Explanation

• HTTP Request to Flickr API

http://www.flickr.com/services/api/

• API provides data as XML feeds (RSS, ATOM)

• Requesting “/feeds/” with a “format” of JSON (Javascript Object Notation)

• Querying API for all public photos tagged “cil2008” with the “tags” parameter

Code Sample #2: Flickr API - Display Photos (Javascript) – The URL Request in Javascript

<!-- use script tag to make request to flickr api, specify json format and tag to search -->

<script type="text/javascript" src="http://api.flickr.com/services/feeds/photos\_public.gne?tags=cil2008&format=json">

</script>

Code Sample #2: Flickr API - Display Photos (Javascript) - Explanation

• JSON is actually javascript and to make JSON output available we must call it on the page via the <script> tag

• After <script> tag is run, JSON output exists as javascript object ready to be parsed

Code Sample #3: Flickr API - Display Photos (Javascript) – JSON Response

jsonFlickrFeed({

"title": "Photos from everyone tagged cil2008",

"link": "http://www.flickr.com/photos/tags/cil2008/",

"description": "",

"modified": "2008-04-07T18:43:16Z",

"generator": "http://www.flickr.com/",

"items":

[

{

"title": "So many floors",

"link": "http://www.flickr.com/photos/nengard/2395908509/",

"media": {"m":"http://farm4.static.flickr.com/3182/2395908509\_d6452e2d56\_m.jpg"},

"date\_taken": "2008-04-07T13:07:53-08:00",

"description": "So many floors",

"published": "2008-04-07T18:43:16Z",

"author": "nobody@flickr.com (nengard)",

"author\_id": "10137764@N00",

"tags": "hyatt cil2008 cil08"

},

…

]

})

Code Sample #3: Flickr API - Display Photos (Javascript) - Explanation

• More structured data ready to be parsed

• We’ll extract the values and format for display using the second javascript

Code Sample #4: Flickr API - Display Photos (Javascript) – Parse and display with Javascript

<script type="text/javascript">

//run function to parse json response, grab title, link, and media values - place in html tags

function jsonFlickrFeed(fr) {

for (var i = 0; i < fr.items.length;i++) {

document.write('<a title="' + fr.items[i].title + '" href="' + fr.items[i].link + '"><img src="' + fr.items[i].media.m + '" alt="' + fr.items[i].title + '"></a>');

}

}

</script>

Code Sample #4: Flickr API - Display Photos (Javascript) - Explanation

• Create javascript function “jsonFlickrFeed” to parse JSON response returned from first javascript

• Loop statement: “for (var i = 0; i < fr.items.length;i++)” runs through all JSON data nodes

• “document.write” – native javascript function prints out values from JSON in xHTML markup