

New Web Site Tools & Technologies:

AJAX (Asynchronous JavaScript and XML)

:: Computers in Libraries 2006 ::

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What are we going to talk about?

- Show some examples
- Define AJAX
- Suggest some possible library applications
- Talk about pros and cons of AJAX
- Show you where you can learn more
- Open floor for questions

AJAX Examples - What's all the buzz about?

- Open Web Applications
 - [Google Maps](http://maps.google.com/)
(http://maps.google.com/)
 - [SproutLiner](http://sproutliner.com/)
(http://sproutliner.com/)
 - [Yahoo Instant Search](http://instant.search.yahoo.com/)
(http://instant.search.yahoo.com/)
 - [Google Suggest](http://labs.google.com/suggest/)
(http://labs.google.com/suggest/)
 - [Scriptaculous wiki](http://wiki.script.aculo.us/scriptaculous/show/Demos)
(http://wiki.script.aculo.us/scriptaculous/show/Demos)

AJAX - What is it?

- “Asynchronous Javascript and XML”
- Using Javascript, (X)HTML and nonstandard XMLHttpRequest() object to communicate with server-side scripts
- Send/Receive information in a variety of formats, including XML, HTML, and even text files.
- “Asynchronous” nature, which means it can do all of this without having to refresh the page.
- Enables web applications that feel like desktop(native) applications

AJAX - Library Use Cases

- Browsing subject headings
- “Pre-displaying” indexes and databases categories
- Complex ILL or contact forms
- Federated Search
- OPAC and digital library interfaces

AJAX - Library Use Cases (cont.)

- Library Applications
 - [BrowseSearch - MSU Subject Headings](http://localhost/ajax/browseloc.php)
(http://localhost/ajax/browseloc.php)
 - [Phoenix Live OPAC - OCLC Research](http://phoenix.orhost.org)
(http://phoenix.orhost.org)
 - [Federated Search - Curtin University of Technology Library \(Perth, Western Australia\)](http://library.curtin.edu.au/cgi-bin/search/search.cgi?query=&submit=Search)
(http://library.curtin.edu.au/cgi-bin/search/search.cgi?query=&submit=Search)
 - [Guesstimate - Virginia Tech Libraries](http://addison.vt.edu)
(http://addison.vt.edu)

AJAX - Why is it good?

- Built with open standards: (X)HTML, CSS, JavaScript, and XML
- Reduces the number of pages needed to perform a task
- Faster, streamlined interfaces
- Most efficient use of bandwidth for data presentation
- W3c Web API Working Group looking to standardize XMLHttpRequest()

AJAX - Why is it bad?

- Breaks back button functionality
- Decreased usability - state of page not always communicated
- Relies on client-side processing - Javascript can be turned off in browser
- Reliance on newer browsers with XMLHttpRequest() support

AJAX - When to use it?

- Anytime there is a search function
- Streamline multi-step processes
- Processing large or distributed datasets
- Validating complex forms
- Predictable, controlled user environment

AJAX - Further References

- Articles
 - [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://beta.news.com.com/Ajax+gives+software+a+fresh+look/2100-1007_3-5886709.html?
 - [Weighing the Alternatives](#) (from ajax info)
<http://www.ajaxinfo.com/default~viewart~8.htm>
- 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>
- Tutorials
 - [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
 - [Dynamic HTML and XML: The XMLHttpRequest Object](#) (from Apple Developer Connection)
<http://developer.apple.com/internet/webcontent/xmlhttpreq.html>
 - [Mastering Ajax, Part 1: Introduction to Ajax](#) (from IBM developerWorks)
<http://www-128.ibm.com/developerworks/web/library/wa-ajaxintro1.html?ca=dgr-wikiAJAXinto1>

Questions?

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AJAX – BrowseSearch Code Examples

browseloc.php

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
<head>
<title>CIL 2006 :: Example: Library of Congress BrowseSearch</title>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<script type="text/javascript" language="JavaScript">
<!--
//XMLhttp variable will hold the XMLHttpRequest object
var xmlhttp = false;

// If the user is using Mozilla/Firefox/Safari/etc
if (window.XMLHttpRequest) {
    //Intiate the object
    xmlhttp = new XMLHttpRequest();
    //Set the mime type
    xmlhttp.overrideMimeType('text/xml');
} else if (window.ActiveXObject) {
    //Intiate the object
    xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
}

function preSearch() {
    //Put the form data into a variable
    var theQuery = document.getElementById('query').value;
    //If the form data is *not* blank, query the DB and return the results
    if(theQuery != "" ) {
        //If search pauses when fetching, change the content of the "result" DIV to "Searching..."
        document.getElementById('result').innerHTML = "Searching...";
        //This sets a variable with the URL (and query strings) to our PHP script
        var url = 'browseloc-search.php?q=' + theQuery;
        //Open the URL above "asynchronously" (that's what the "true" is for) using the GET method
        xmlhttp.open('GET', url, true);
        //Check that the PHP script has finished sending us the result
        xmlhttp.onreadystatechange = function() {
            if(xmlhttp.readyState == 4 && xmlhttp.status == 200) {
                //Replace the content of the "result" DIV with the result returned by the PHP script
                document.getElementById('result').innerHTML = xmlhttp.responseText + ' ';
            } else {
                //If the PHP script fails, display a simple notification
                document.getElementById('result').innerHTML = 'Error: preSearch Failed!';
            }
        };
        xmlhttp.send(null);
    }
}
//-->
```

```
</script>
</head>
<body>
<div id="contain">
<div id="main"><a name="mainContent"></a>
  <h2 class="mainHeading">CIL 2006 :: Example: Library of Congress BrowseSearch</h2>
  <form id="searchbox" action="browseloc-search.php" method="post">
  <p><label for="query"><strong>BrowseSearch:</strong></label>
  &nbsp;<input type="text" name="query" autocomplete="off" id="query" onKeyUp="preSearch()" />
  &nbsp;</p>
  </form>
  <div id="result">&nbsp;</div>
</div>
<!-- end main div -->
</div>
<!-- end contain div -->
</body>
</html>
```

browseloc-search.php

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
<head>
<title>CIL 2006 :: Example: Library of Congress BrowseSearch</title>
</head>
<body>
<?php
//declare variables to be used in query and display
$keywords = $_GET['q'];
$link = "<p><a href=\"browseloc.php\">Refresh Library of Congress BrowseSearch</a></p>";
//trim whitespaces, tabs and breaks from search terms
$keywords = trim($keywords);
//create message if search form was empty
if (!$keywords) {
    echo "<h2 class=\"warn\">No search term given.</h2>";
    echo $link;
    exit;
}
// bring database parameters and functions onto page
include ("./meta/_db_props_loc.php");
//connect to database server
mysql_pconnect(HOST,USER,PASS) or die("Unable to connect to database");
mysql_select_db(DATABASE_NAME);
//form sql statement
$query = "SELECT subject_id, label, callno FROM subject WHERE label LIKE '%$keywords%' ORDER BY
callno ASC";
//store sql result as an array
$result = mysql_query($query) or die('<p class=\"warn\">Error retrieving subjects from loc database!<br />'.
    'Error: ' . mysql_error() . '</p>');
//create message if no rows match search terms
if (mysql_num_rows($result) == 0) {
    echo "<h2 class=\"warn\">Sorry, no matching results.</h2>";
    echo $link;
    exit;
}
//format sql result for display
while($record = mysql_fetch_object($result))
    {
    echo '<dl><dt><strong>' . stripslashes($record->label) . '</strong></dt>';
    echo '<dd>Call Number Range: ' . stripslashes($record->callno) . '</dd>';
    echo '<dd><a href="http://www.lib.montana.edu/help/locationguide.html">Find Call Number on Library
Floor Map</a></dd></dl>';
    echo '<hr size="1" />';
    }
    echo $link;
?>
</body>
</html>
```

Table schemata and partial data dump for loc subjects table

```
--  
-- Database: `loc`  
--  
--  
-- Table structure for table `subject`  
--  
CREATE TABLE `subject` (  
  `subject_id` int(8) NOT NULL auto_increment,  
  `label` text NOT NULL,  
  `callno` varchar(255) NOT NULL default "",  
  PRIMARY KEY (`subject_id`),  
  FULLTEXT KEY `full_index` (`label`)  
) ENGINE=MyISAM;  
  
--  
-- Dumping data for table `subject`  
--  
INSERT INTO `subject` VALUES (1, 'Collections, Series, Collected Works', 'AC');  
INSERT INTO `subject` VALUES (2, 'Encyclopedias (General)', 'AE');  
INSERT INTO `subject` VALUES (3, 'Dictionaries and Other General Reference Works', 'AG');  
INSERT INTO `subject` VALUES (4, 'Indexes (General)', 'AI');  
INSERT INTO `subject` VALUES (5, 'Museums. Collectors and Collecting', 'AM');  
INSERT INTO `subject` VALUES (6, 'Newspapers', 'AN');  
INSERT INTO `subject` VALUES (7, 'Periodicals', 'AP');  
INSERT INTO `subject` VALUES (8, 'Academies and Learned Societies (General)', 'AS');  
INSERT INTO `subject` VALUES (9, 'Yearbooks. Almanacs. Directories', 'AY');  
INSERT INTO `subject` VALUES (10, 'History of Scholarship and Learning. The Humanities', 'AZ');  
INSERT INTO `subject` VALUES (11, 'General Works', 'A');  
INSERT INTO `subject` VALUES (12, 'Logic', 'BC');  
INSERT INTO `subject` VALUES (13, 'Speculative Philosophy', 'BD');  
INSERT INTO `subject` VALUES (14, 'Psychology, Parapsychology, Occult Sciences', 'BF');  
INSERT INTO `subject` VALUES (15, 'Aesthetics', 'BH');  
INSERT INTO `subject` VALUES (16, 'Ethics. Social Usages. Etiquette', 'BJ');  
INSERT INTO `subject` VALUES (17, 'Religion', 'BL');  
INSERT INTO `subject` VALUES (18, 'Judaism', 'BM');  
INSERT INTO `subject` VALUES (19, 'Islam, Bahaism, Theosophy', 'BP');  
INSERT INTO `subject` VALUES (20, 'Buddhism', 'BQ');  
INSERT INTO `subject` VALUES (21, 'Christianity', 'BR');  
INSERT INTO `subject` VALUES (22, 'The Bible', 'BS');  
INSERT INTO `subject` VALUES (23, 'Doctrinal Theology', 'BT');  
INSERT INTO `subject` VALUES (24, 'Practical Theology', 'BV');  
INSERT INTO `subject` VALUES (25, 'Christian Denominations', 'BX');  
INSERT INTO `subject` VALUES (26, 'Philosophy (General)', 'B');  
INSERT INTO `subject` VALUES (27, 'History of Civilization', 'CB');
```