

# AJAX Workshop

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# Outline

1. What you're in for...
2. What's AJAX?
3. Why AJAX?
4. Look at some AJAX examples
5. AJAX for Libraries
6. Walkthrough sample AJAX application



# What you're in for...

- A discussion about an emerging web application framework
- An introduction to the essential elements of AJAX
- How does AJAX fit into libraries?
- Walkthrough the code of a working AJAX application



# What is AJAX?

- Asynchronous Javascript and XML
  - Not all AJAX apps involve XML
- Combination of technologies
  - XHTML, CSS, DOM
  - XML, XSLT, XMLHttpRequest, JavaScript
  - Some server scripting language
- A method for building more responsive and interactive applications



# AJAX Components

## **XHTML and CSS**

Ajax applies these familiar Web standards for styling the look and feel of a page and to markup those areas on a page that will be targeted for data updates.

## **DOM (document object model)**

Ajax uses the DOM to manipulate dynamic page views for data and to walkthrough documents to “cherrypick” data. The DOM enables certain pieces of an Ajax page to be transformed and updated with data.

## **XML, JSON (Javascript Object Notation), HTML, or plain text**

Ajax can use any of these standards to provide structure to the data it passes to and from a page.

## **XMLHttpRequest object**

The heavy lifter for Ajax: It's a javascript object embedded in most modern browsers that sets up data request/response pipelines between client and server.

## **Javascript**

Lightweight programming language that Ajax uses for instructions to bind all of the components together.



# Why AJAX?

- Want to make your applications more interactive
- Want to incorporate data from external Web Services
- Don't want your users to have to download a plugin



# Client vs. Server Scripting

- Client scripting
  - Web browser does all the work
- Server Scripting
  - Web server does all the work
- AJAX leverages both client and server side scripting

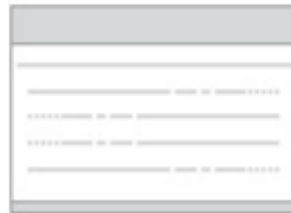


# How AJAX Works

## TRADITIONAL WEB INTERACTION



1. User Request

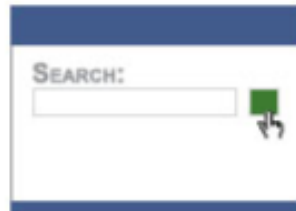


2. Screen Reload

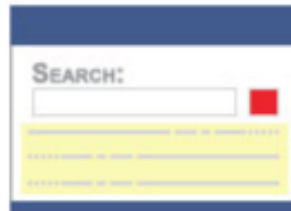


3. Data Update

## AJAX WEB INTERACTION



1. User Request



2. Data Update



# AJAX Web Interaction

- What you don't see
- Data reload happens in the background
- JavaScript queries the server to get the proper data without you knowing it
- Page updates without a screen “reload”



# Potential Problems

- Javascript MUST be enabled
- Back button doesn't always work
- Pages can be difficult to bookmark
- Search engines may not be able to index all portions of an AJAX site
- Cross browser differences in how XML is dealt with



# AJAX and Accessibility

- AJAX done correctly can help with accessibility issues
  - Dynamic content such as
    - Tabs
    - Smart Forms
- Use href and onClick in conjunction to deal with Javascript being disabled



# Some AJAX examples

- [Google Calendar](#)
- [Flickr](#)
- [del.icio.us](#)
- [LibraryThing](#)
- [Backpack](#)



# Basic AJAX Components

- **Server-side Component**
  - Communicates with the database, or web service
  - Can be written in any server-side language (PHP, ASP, Coldfusion, etc)
- **Client-side Component**
  - Written in Javascript, often uses XMLHttpRequest
  - Accesses the server side page in the background



# Hidden Frame Method

- Communication with server takes place in a frame that user can't see
- Back and Forward buttons still work
- If something goes wrong user receives no notification
- Becoming rare to see used with development of AJAX libraries



# XMLHttp Method

- Code is cleaner and easier to read
- Able to determine if there is a failure
- No browser history, Back and Forward buttons break



# AJAX Script Libraries

- You could choose to write AJAX code from scratch
- Or you can use a script library
  - faster, more consistent, better code
    - Prototype
    - jQuery
    - Ext JS
    - `script.aculo.us`



# Potential Uses for AJAX

- Error checking in Forms
- AutoSuggest
- Drag and Drop objects functionality
- Dynamically move view around on image or map
- Preload content you want to show later
- Apply limits to search results and get new results quickly



# AJAX for Libraries

- 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

- SingleSearch - Curtin University Library (<http://apps.library.curtin.edu.au/singlesearch/search.cgi>)
- Content Panes - TERRA: The Nature of Our World Montana State University Libraries (<http://lifeonterra.com>)
- Guesstimate - Virginia Tech Libraries (<http://addison.vt.edu>)



# Code Samples and Downloads

- People @ the Library (XML)  
<http://www.lib.montana.edu/~jason/files/ajax/list/>
- Yahoo! News Search @ the Library (JSON)  
<http://www.lib.montana.edu/~jason/files/ajax/search/>
- Contact the Library (Feedback and Validation)  
<http://www.lib.montana.edu/~jason/files/ajax/validate/>
- People @ the Library (HTML and Feedback)  
<http://www.lib.montana.edu/~jason/files/ajax/show/>



# AJAX – Sample Applications

- PageInsert - WorldCat Form
- BrowseSearch - LOC Subject

## Headings

- Download PageInsert code at <http://www.lib.montana.edu/~jason/files.php>
- Download BrowseSearch code at <http://shelf.lib.montana.edu/~jason/files/ajax/browsesearch/>



# AJAX and APIs

Data available on the web for libraries to access via APIs

- LibraryThing API
- Google Books Availability API
- WorldCat API
- Google and Yahoo Maps



# AJAX and APIs Examples

TAMU Geologic Atlas of the United States - <http://repository.tamu.edu/handle/1969.1/2490>

Plymouth State University Lampson Library  
Catalog - <http://library.plymouth.edu/read/184908>

National Library of Australia Library Labs - <http://ll01.nla.gov.au/search.jsp?searchTerm=enigma>



# Studying AJAX in the Wild

## TERRA: The Nature of Our World

- Tabbed Environment
- Comments
- Ratings
- Pros and Cons - page views, instant feedback, web stats can be problematic



# Studying AJAX in the Wild

## UH Libraries CMS

- staff only interface
- ability to seamlessly edited multiple parts of the screen
- can control what browser people use
- No other way to create this type of interface for updating content
- old interface klunky and frustrating for staff



# Final thoughts – What's Next?

- That's AJAX and AJAX applications in a nutshell.
- Consider AJAX advantages and disadvantages
- Fundamentals of method are there
- Keep practicing and learning



# Contact Information

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