An Overview of the Fluid Engage Architecture

Colin Clark, Fluid Project Technical Lead, Adaptive Technology Resource Centre
Topics We’ll Cover

• Engage’s technology goals
• The Fluid approach
• Shape of the Engage architecture
• How Infusion fits
• Services layer
• Mobile applications
• User interfaces and the exhibit toolkit
• Mapping and visualization
Challenges

• Accessibility in the digital environment can be complex and confusing
• Lack of continuity across spaces
• Hard to weave together data & systems
• Mobile space is chaotic
• Hard to integrate visitor-generated content and social networking
Engage’s Technology Goals

- Enable great design
- Interconnected data
- Approachable: easy to extend/adapt
- Bridging: connect physical and online
- Scalable (up & down) and forward-looking
- Fun, cheaper, easier development
The Open Web Today

- Multi-touch gestures
- Audio and video
- Vector graphics and animation
- Great accessibility
- All work on mobile today!
- Stable and deeply interoperable
- Everyone knows it
Engage at a Glance

- Interconnected data: services and feeds
- Bridging spaces: mobile apps
- Exhibit toolkit: great user experiences
- Making connections: mapping
- Accessibility all the way through
A Metaphor: UX Weave

freeform knit & crochet fabric by Prudence Mapstone
A Metaphor: UX Weave

hand-dyed weave by Felicia Lo
Tech sandwiches...

Engage

Services Layer

mFSS

Infusion
Tech sandwiches... not so tasty

Engage
Services Layer
mFSS
Infusion

Fluide

Wednesday, August 19, 2009
How Does Infusion Fit?
What is Infusion?

*Constellation by Alexander Calder*
What is Infusion?

• A toolkit built by the Fluid community
• Directly responds the hard stuff:
  • Accessibility
  • Better usability
• All the building blocks you need for creating great rich Web apps
• Solid, shipping product used around the world
Uploader

**Upload Files**

<table>
<thead>
<tr>
<th>File Name</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LICENSE.txt</td>
<td>12.1 KB</td>
</tr>
<tr>
<td>maven.xml</td>
<td>1.8 KB</td>
</tr>
<tr>
<td>pom.xml</td>
<td>0.9 KB</td>
</tr>
<tr>
<td>project.properties</td>
<td>0.1 KB</td>
</tr>
<tr>
<td>project.xml</td>
<td>1.2 KB</td>
</tr>
<tr>
<td>README.txt</td>
<td>5.4 KB</td>
</tr>
</tbody>
</table>

Uploading: 5 of 6 files (15.9 KB of 21.3 KB)

[Done] [Pause]
### Site Settings

#### Members

<table>
<thead>
<tr>
<th>Members</th>
<th>Email</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe I. Instructor</td>
<td><a href="mailto:joe@sakai.university.edu">joe@sakai.university.edu</a></td>
<td>Instructor</td>
</tr>
<tr>
<td>Mike A. Smith</td>
<td><a href="mailto:msmith@yahoo.com">msmith@yahoo.com</a></td>
<td>TA</td>
</tr>
<tr>
<td>Jane Doe</td>
<td><a href="mailto:j.doe@sakai.university.edu">j.doe@sakai.university.edu</a></td>
<td>Student</td>
</tr>
<tr>
<td>Laura S. Roberts</td>
<td><a href="mailto:robertsLaura@gmail.com">robertsLaura@gmail.com</a></td>
<td>Guest</td>
</tr>
<tr>
<td>Erin A. Wilson</td>
<td><a href="mailto:thewilsones@hotmail.com">thewilsones@hotmail.com</a></td>
<td>Student</td>
</tr>
<tr>
<td>Ben Singer</td>
<td><a href="mailto:singer21@hotmail.com">singer21@hotmail.com</a></td>
<td>Student</td>
</tr>
<tr>
<td>Bhaktavatsalam Bhayakridbhyanashanchar</td>
<td><a href="mailto:bb@local.host">bb@local.host</a></td>
<td>Student</td>
</tr>
<tr>
<td>Dept Admin</td>
<td><a href="mailto:da1@local.host">da1@local.host</a></td>
<td>Instructor</td>
</tr>
<tr>
<td>Ángelo Hasil</td>
<td><a href="mailto:ah@local.host">ah@local.host</a></td>
<td>Student</td>
</tr>
</tbody>
</table>

Pager

Wednesday, August 19, 2009
UI Options & FSS

My Dashboard

User Interface Options

- Easier to see
  - Font style: Serif
  - Minimum text size: [ ]
  - Text Spacing: Regular
  - Line Spacing: [ ]
  - Contrast: Medium Contrast
  - Background Images: [ ] Yes [ ] No
  - Simplified Layout: [ ] Yes [ ] No

- Easier to find
  - Preview window (updates automatically)

Tools
- Add Tools: [ ]
- Home [ ]
- Profile [ ]
- Membership [ ]
- Schedule [ ]
- Resources [ ]
- Worksite Setup [ ]
- Preferences [ ]
- Account [ ]

Reset [ ] Save and apply [ ] Cancel [ ]
UI Options: High Contrast Theme
How We’ll Use Infusion

• Infusion is the backbone of Engage
• Gives us accessibility, flexibility for UIs
• Infrastructure for doing mashups and social networking
• Works with any Web application
• Themes for great-looking mobile apps
Services and Interoperability
Services and Interoperability

• It’s hard to make systems talk
• Risk: duplicated data, redundant effort
• Goal: create an open architecture for sharing data
• Services and data feeds make up an Engage content ecosystem
Engage’s Approach to Data

- Every collection is unique
- Lots of different schemas and formats
- Hard to get everyone to agree on one
- Treat schemas as adaptable
- Document-oriented, schema-less
Services Layer

- Collection of exhibit-related data feeds
- Services for common activities:
  - Importing and sharing exhibit data
  - Search
  - Social: tagging, discussion
  - Personal collections
- Standard Web tech: REST and JSON
Big Question for Museums:

What platforms should we support?
Everything?
Everything?

Objective-C  |  Java  |  C++
Cocoa Touch  |  Android SDK  |  Carbide
Only One?
Only One?
Mobile: Embrace the Web

- Phones now have great browsers built in
- Web design is ubiquitous and familiar
- Use standard HTML, CSS, and JavaScript
- Blends seamless into existing sites
- Thin native apps provide access to interactive features (camera, bluetooth)
Hybrid App Illustrated

Mobile Device

Native App

Embedded Web View
WebKit

JavaScript Bridge
using JavaScriptCore

Device OS APIs
WiFi, Camera, Bluetooth

Web Content

Infusion-powered Online Exhibit

HTML
CSS
JavaScript
Mobile FSS

- Collections
- Artists
- Objects
- Time Periods
- Geocultural Areas
- Geocultural Map
- Thematic Tours
- Fonds
Exhibit Toolkit
Exhibit Toolkit

- Goal: fit seamlessly into existing workflow
- UI components, templates, and data feeds
- Wire them up to create great experiences
- Use them with any Web authoring tool
Some Component Ideas

- Collection Browse and Search
- Image Gallery
- Audio Tour
- Interactive Map
- Tagging
- Comments, Discussion, Stories
- My Museum/My Collection
Mapping & Visualization
Mapping

- Mapping is a bridge between physical and online
- Broad definition: conceptual and spatial
- Draw relationships between objects
- Maps locate and visualize data and services (e.g., search identifies object location)
Mapping Technology

- Authoring tool:
  - bring in your designed maps
  - tag and layer with information
- Interactive visualizations using Web technology: HTML 5
Location Awareness
Location Awareness
Location Awareness

- We’re taking it slow, learning from others
- Start simple: **focus on content**
- Lots of potential in this space
  - Triggered audio tours
  - Context-aware information about exhibit
  - Accessible wayfinding

Wednesday, August 19, 2009
Potential Technologies

• 2D barcodes + phone camera
• WiFi positioning (WIPS is awesome)
• Bluetooth beacons
• Scene recognition
• Simple RFID tags
Technology Specifics
Technologies

• Things we’ve decided on:
  • Infusion + HTML, CSS & JavaScript UIs
  • Hybrid Web/native mobile apps
  • Schema-less database
  • RESTful services
  • Canvas for visualization
Technologies

- Things we’ll decide on this week:
  - Specific database: **CouchDB**
  - Server technology: **JavaScript + JSGI**
  - Visualization: **Processing.js?**
JavaScript on the Server

- We looked at PHP, Ruby, Python: always just a slice of the developer pie
- JavaScript is the most-used language in the world
- Shared infrastructure: client and server
- A little crazy, but pretty solid
Technologies

• Things we’ll decide along the way:
  • Location awareness:
    • RFID, 2D barcodes, WiFi?
  • More interoperability:
    • Museum APIs?
    • TourML, steve.museum, etc?
More Reading

http://wiki.fluidproject.org/display/fluid/Engage+Architecture