

Accessibility for Rich Internet Applications:

Techniques & Toolkits

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Topics We'll Cover

- A quick introduction
- The Fluid Community
- Challenges of rich internet accessibility
- Solutions and standards
- Dojo
- jQuery
- Fluid Infusion

Introductions

Links

- <http://fluidproject.org/>
- <http://wiki.fluidproject.org>
- <http://build.fluidproject.org>
- <http://uidesignpatterns.org/>

The Fluid Community

An international open source community of interaction designers, developers, and accessibility experts dedicated to improving the open web.

Challenge for Open Source

UX is a challenge for all open source projects

- How do we address the systemic problems of poor usability and accessibility?
- How do non-technical people get involved in OSS?
- How can we help designers and developers speak the same language?
- How do you do user testing in a distributed environment?

What is Fluid?

An open source project that creates user experience tools and software capable of addressing the needs of diverse users.

- Flexible, reusable user interface components
- Development tools to support inclusive design
- Design Handbook
- Accessible Interaction Designs
- Design Pattern Community

Rich Internet Accessibility

What is *Accessibility*?

A New Definition

- Accessibility is the ability of the system to accommodate the needs of the user
- Disability is the mismatch between the user and the interface provided
- We all experience disability
- Accessible software = better software

DHTML: A New Can of Worms

- The shift from documents to applications
- Familiar a11y techniques aren't enough
- Most DHTML is completely inaccessible
- New techniques are still being figured out

Assistive Technologies

- Present and control the user interface in different ways
- Screen readers
- Screen magnifiers
- On-screen keyboards
- Use built-in operating system APIs to understand the user interface

The Problem

- Custom widgets often look, but don't act, like their counterparts on the desktop
- HTML provides only simple semantics
- Not enough information for ATs
- Dynamic updates require new design strategies to be accessible

The Solution

- Describe user interfaces with ARIA
- Add consistent keyboard controls
- Provide flexible styling and presentation

Supporting Assistive Technology

Opaque Markup

// These are tabs. How would you know?

```
<ul>
```

```
  <li>Cats</li>
```

```
  <li>Dogs</li>
```

```
  <li>Gators</li>
```

```
</ul>
```

```
<div>
```

```
  <div>Cats meow.</div>
```

```
  <div>Dogs bark.</div>
```

```
  <div>Gators bite.</div>
```

```
</div>
```


Opaque Markup: Tabs



ARIA

- Accessible Rich Internet Applications
- W3C specification in the works
- Fills the semantic gaps in HTML
- Roles, states, and properties
- Live regions

Roles

- Describe widgets not present in HTML 4
- `slider`, `menubar`, `tab`, `dialog`
- Applied using the `role` attribute

States and Properties

- Added to elements within the DOM
- Properties describe characteristics:
 - `draggable`, `hasPopup`, `required`
- States describe what's happening:
 - `busy`, `disabled`, `selected`, `hidden`
- Applied using custom `aria-` attributes

Using ARIA

```
// Now *these* are Tabs!  
<ul id="animalTabs" role="tablist" tabindex="0">  
  <!-- Individual Tabs shouldn't be focusable -->  
  <!-- We'll focus them with JavaScript instead -->  
  <li id="cats" role="tab" tabindex="-1">Cats</li>  
  <li id="dogs" role="tab" tabindex="-1">Dogs</li>  
  <li id="gators" role="tab" tabindex="-1">Gators</li>  
</ul>  
<div id="panels">  
  <div role="tabpanel" aria-labelledby="cats">Cats meow.</div>  
  <div role="tabpanel" aria-labelledby="dogs">Dogs bark.</div>  
  <div role="tabpanel" aria-labelledby="gators">Gators bite.</div>  
</div>
```

Keyboard Accessibility

Keyboard Navigation

- Everything that works with the mouse should work with the keyboard
- ... but not always in the same way
- Support familiar conventions

Keyboard Conventions

- **Tab** key focuses the control or widget
- **Arrow keys** select an item
- **Enter** or **Spacebar** activate an item
- Tab is handled by the browser. For the rest, you need to write code.

Tabbing and Tabindex

- Each focusable item can be reached in sequence by pressing the **Tab** key
- **Shift-Tab** moves backwards
- The `tabindex` attribute allows you to customize the tab order
- `tabindex="-1"` removes element from the tab order: useful for custom handlers

TabIndex examples

```
<!-- Tab container should be focusable -->
<ul id="animalTabs" tabindex="0">
  <!-- Individual Tabs shouldn't be focusable -->
  <!-- We'll focus them with JavaScript instead -->
  >
  <li id="tab1" tabindex="-1">Cats</li>
  <li id="tab2" tabindex="-1">Dogs</li>
  <li id="tab3" tabindex="-1">Alligators</li>
</ul>
```

Arrow Key Navigation

```
// Make the tabList focusable with Tab.  
var tabList = jQuery("#animalTabs").attr("tabindex", 0);  
  
// Make the tabs selectable with the arrow keys.  
var tabs = jQuery("li", tabList);  
tabs.selectable(tabList, {  
    willSelect: function(aTab) {  
        aTab.addClass("highlight");  
    }  
});
```

Things to Think About

- What kind of UI are you building?
- Does it resemble something familiar?
- What states or modes does it have?
- Can you reuse an existing widget?

Accessibility Resources

<http://codetalks.org>

<http://wiki.fluidproject.org/display/fluid/DHTML+Developer+Checklist>

<http://wiki.fluidproject.org/display/fluid/UX+Accessibility+Walkthrough+Protocols>

http://developer.mozilla.org/en/docs/Accessible_DHTML

http://developer.mozilla.org/en/docs/Key-navigable_custom_DHTML_widgets

http://developer.mozilla.org/en/docs/AJAX:WAI_ARIA_Live_Regions

Toolkit Accessibility

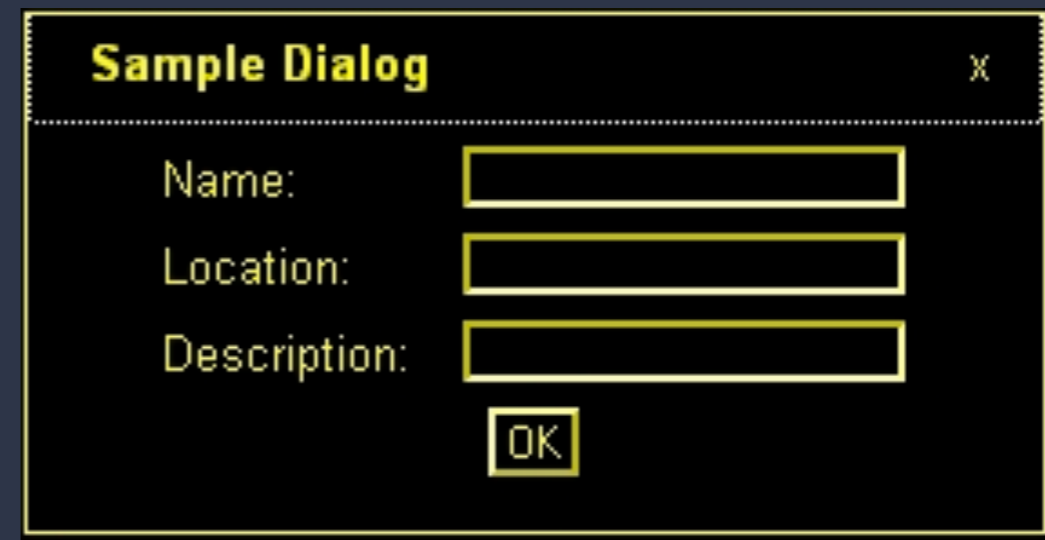
Dojo

- The first to tackle DHTML accessibility
- Accessibility features include:
 - Support for Windows High Contrast
 - Comprehensive ARIA library
 - Keyboard navigation
- Most core widgets are covered

Dojo High Contrast



A standard Dojo dialog box titled "Sample Dialog" with a close button (X) in the top right corner. The dialog has a white background and contains three text input fields labeled "Name:", "Location:", and "Description:". Below the input fields is an "OK" button.



A high-contrast version of the "Sample Dialog" with a black background and yellow text and borders. The dialog title "Sample Dialog" and the close button (X) are in yellow. The input fields and the "OK" button are also outlined in yellow.

jQuery

- A truly community-driven effort
- A step-by-step approach
- Features include:
 - Several accessible widgets, more to come
 - Comprehensive ARIA library
 - Keyboard navigation in progress

jQuery

Dialog

The screenshot displays a jQuery Dialog plugin interface. A central dialog window titled "Basic dialog" is open, containing the text: "This is the default dialog which is useful for displaying information. The dialog window can be moved, resized and closed with the 'x' icon." The dialog has a yellow title bar with a close button (an 'x' icon) and a resize handle (three diagonal lines) in the bottom right corner. In the background, a form is visible with various input fields: a text input, a checkbox, a radio button, a select dropdown, and a text area. The text area is labeled "textarea" and has a red dotted underline. To the right of the dialog, there is a "New window" button with a square icon. The background also contains some placeholder text: "Sed vel diam id l...", "faucibus ante. Et...", "amet auctor elit...", "s rhoncus", and "cies neque, sit".

Fluid Infusion

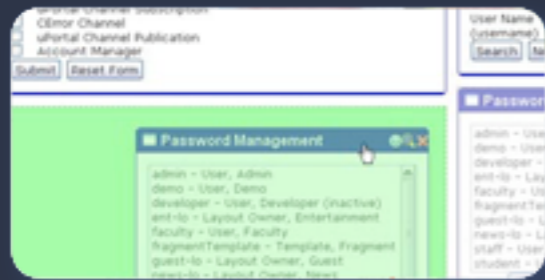
Infusion is...

- A collection of rich UI components
- A framework for building your own
- Built on top of jQuery
- Built from the ground up for accessibility
- Personalizable and adaptable
- Ideal for portals, mashups, and CMS

Components

- Encompass familiar Web activities
 - Working with files, finding stuff, authoring
 - Rich interactions: drag and drop, etc.
- Activities and contexts, not just widgets
- Designed to be extended and adapted

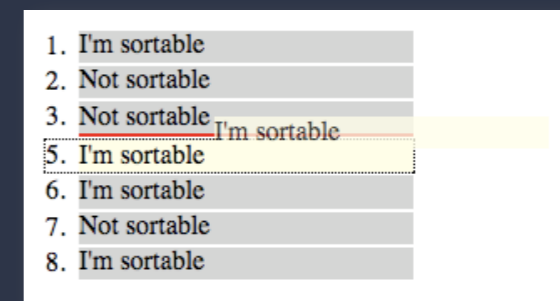
The Reorderer Family



layouts



grids



lists

Uploader

Upload Files ✕

File Name	Size	
LICENSE.txt	12.1 KB	✓
maven.xml	1.8 KB	✓
pom.xml	0.9 KB	✓
project.properties	0.1 KB	✓
project.xml	1.2 KB	
README.txt	5.4 KB	

Uploading: 5 of 6 files (15.9 KB of 21.3 KB) [Add more](#)

Pager

Firefox File Edit View History Bookmarks Tools Window Help

The Sakai Foundation

http://build.fluidproject.org/fluid/sample-code/pager/sakai-site-setting/site_setting_members.html

Most Visited Blogs News Travel TinyURL Fluid Work Blogs System Alerts Standup Fluid Engage Family Blog The Personal World ...

Stumble! I like it! Send to Channels: All Favorites Friends Tools

Site Settings

Help Close & Return to

General **Members** Roles & Permissions Site Backup & More

[Add Members](#)

Select All | Select All Visible | Unselect All | 0 Selected


1-10 of 187 Items | View 10 Per Page | Prev 1 2 3 ... 17 18 19 (last) Next

Members	Email	Role	
<input type="checkbox"/> Joe I. Instructor	joe@sakai.university.edu	Instructor	Albert Zimmerman Rob van der Voo Active
<input type="checkbox"/> Mike A. Smith	msmith@yahoo.com	TA	Active
<input type="checkbox"/> Jane Doe	j.doe@sakai.university.edu	Student	Active
<input type="checkbox"/> Laura S. Roberts	roberts_laura@gmail.com	Guest	Active
<input type="checkbox"/> Erin A. Wilson	thewilsons@hotmail.com	Student	Active
<input type="checkbox"/> Ben Singer	singer21@hotmail.com	Student	Active
<input type="checkbox"/> Bhaktavatsalam Bhayakridbhayanashanachar	bb@local.host	Student	Active
<input type="checkbox"/> Dept Admin	da1@local.host	Instructor	Active
<input type="checkbox"/> Angelo Haslip	ah@local.host	Student	Active

http://build.fluidproject.org/fluid/sample-code/pager/sakai-site-setting/site_setting_members.html#

UI Options & FSS

My Dashboard

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

User Interface Options

▼ Easier to see

Font style:

Minimum text size:

Text Spacing:

Line Spacing:

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

My Dashboard

User Interface Options

▼ Easier to see

Font style:

Minimum text size: pt

Text Spacing:

Line Spacing:

Contrast:

Background Images: Yes No

Simplified Layout: Yes No

▶ Easier to find

Preview window (updates automatically)

More Tools

Settings Close

Add Tools Toggle View

Home	[remove]
Profile	[remove]
Membership	[remove]
Schedule	[remove]
Resources	[remove]
Worksite Setup	[remove]
Preferences	[remove]
Account	[remove]

Reset Save and apply Cancel

Add Widgets Edit Appearance

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Infusion Framework

- Puts you back in charge of your UI
- No black boxes: everything is configurable
- Totally open architecture
- Models, views, but not gluey controllers
- Make your UIs transformable

Getting Involved

- Join our mailing lists
- Share code or designs
- Use Infusion

Links

- <http://fluidproject.org/>
- <http://wiki.fluidproject.org>
- <http://build.fluidproject.org>
- <http://uidesignpatterns.org/>