

# Stuff we can talk about

- What is Accessibility?
- Accessibility, Design, and Testing
- Evaluation tools
- HTML markup accessibility
- Dynamic Web accessibility (ARIA, keyboard, etc)
- Using the Fluid Skinning System



# 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

# UI Options

- One size doesn't fit all
- Allows users to customize your app:
  - layout
  - styling
  - navigation
- Uses FSS by default; can be configured to work with your own classes

# Accessibility, Design, and Testing



# Better Usability

Designing for everyone

- Look at what an interaction is like for various users and contexts and then (re)envision how it could be
- start with interactions, not technology
- iterative testing
- have a wide-open community



# Testing and Checking

- Fluid UX Walkthroughs
- Evaluators: AChecker, WAVE, and more
- General principles:
  - Flexibility
  - Labelling
  - Alternatives

# Step in the shoes of your users...

- Fluid UX Walkthroughs
- Easy ways to assess usability and accessibility
- Combination *heuristic evaluation* and *cognitive walkthrough*
- Translated: a **checklist** with **scenarios**
- Anyone can do one

<http://wiki.fluidproject.org/display/fluid/User+Experience+Walkthroughs>





# Simple Accessibility Evaluation

1. Try **changing your font size**, window size and resolution
2. Look critically at your page's **layout, structure & content**
3. Use the **Tab key to navigate** through all controls
4. Check for **alternatives** to images, sound, and video

# Layout and Structure

- Is the page structured into logical sections?
- Are the sections clearly labeled?
- Are there sufficient non-visual cues for site structure?
- Are there sufficient visual cues?
- Is the most important information prominent?
- Is navigation consistent from page to page?

# User Testing and Interaction Design

Remote User Testing

Other techniques for making UIs  
awesome



# Tools for Evaluating Accessibility





# Evaluation Tools

1. Static Analyzers
2. HTML and CSS
3. Accessibility

# HTML & CSS Validation

- Validators ensure that HTML and CSS are to spec
- Passing doesn't mean you're accessible, but it's a start
- HTML
  - <http://validator.w3.org/>
  - <http://jigsaw.w3.org/css-validator/>

## Errors found while checking this document as HTML5!

<b>Result:</b>	40 Errors, 2 warning(s)		
<b>Address :</b>	<input type="text" value="http://www.google.com/"/>		
<b>Encoding :</b>	iso-8859-1	<input type="text" value="(detect automatically)"/>	
<b>Doctype :</b>	HTML5	<input type="text" value="(detect automatically)"/>	
<b>Root Element:</b>	html		

# Accessibility Checkers

aChecker


<http://achecker.ca/checker/index.php>



The screenshot shows the 'Input' section of the aChecker website. It features two main options for checking accessibility: 'Check Accessibility by URL' and 'Check Accessibility by File Upload'. Each option has a corresponding text input field and a 'Check It' button. The 'File Upload' option also includes a 'Browse...' button. At the bottom left, there is a link for 'Options'.

Wave

<http://jigsaw.w3.org/css-validator/>



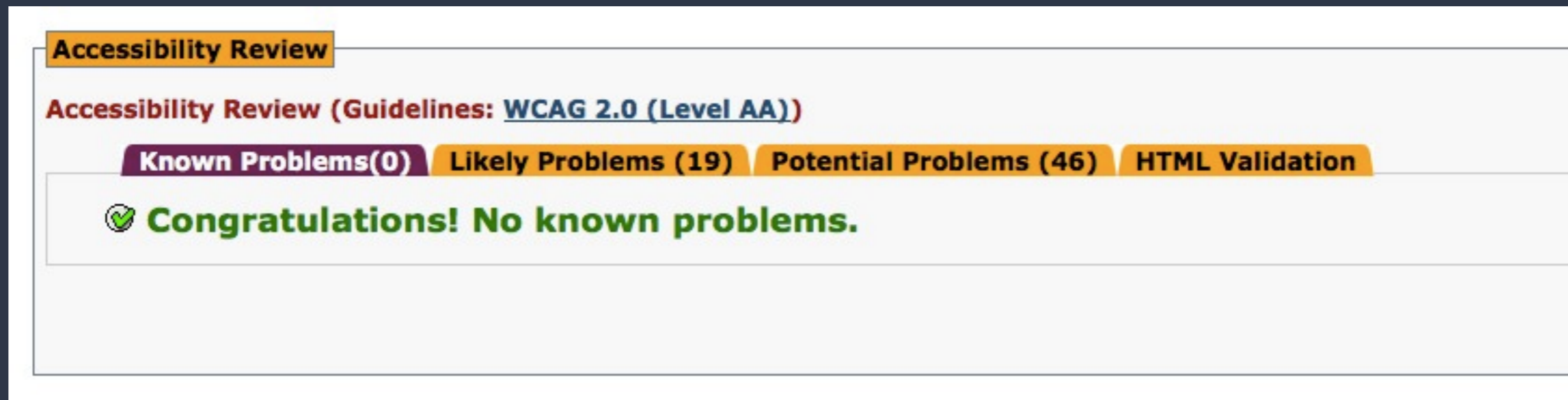
The screenshot shows the Wave website interface. It has two main sections: 'Enter a web site address' and 'Upload a file'. The 'Enter a web site address' section includes a text input field and a 'WAVE this page!' button. The 'Upload a file' section includes a text input field, a 'Browse...' button, and a 'WAVE this file!' button. Below the 'Upload a file' section, there is a brief instruction: 'If you have files that are not publicly available on the internet, you can upload the files for WAVE evaluation. Simply browse to the file using the form below.'



# Accessibility Checkers

aChecker

<http://achecker.ca/checker/index.php>



The screenshot shows the 'Accessibility Review' section of the aChecker tool. It includes a title bar, a subtitle indicating the guidelines used (WCAG 2.0 Level AA), and a summary bar with four categories: 'Known Problems (0)', 'Likely Problems (19)', 'Potential Problems (46)', and 'HTML Validation'. Below this, a green checkmark icon is followed by the text 'Congratulations! No known problems.'

**Accessibility Review**

Accessibility Review (Guidelines: [WCAG 2.0 \(Level AA\)](#))

**Known Problems(0)** **Likely Problems (19)** **Potential Problems (46)** **HTML Validation**

✔ **Congratulations! No known problems.**




# Accessibility Checkers

Wave


<http://jigsaw.w3.org/css-validator/>

WAVE has detected no accessibility errors  
...but you must still check your page to ensure it is actually accessible.  
The following are present in the head section or apply to this page in general:

 disable styles

---

**h1**

 Designing software that works - for everyone.

**title**

**h2** Fluid Daily Build Resources

The demonstration sites available below are updated from SVN nightly. Changes made during the day will not necessarily be available until the following day.

Interactive demos are now available on our [demo portal](#)

**h3** Fluid Integration Examples **h3** Infrastructure



# Accessibility Checkers: What They Do

- Statically analyze markup
- Specify the Guideline for Validation
  - e.g. WCAG 2.0 AA
- Will alert you to in accessible markup
  - e.g. missing alt text on images

✖ **Line 103, Column 9:** Image used for input element is missing Alt text.

```
<input type="image" src="/gallery/graphics/gallery_circle_arrow.gif" class="search-arrow" onmouseout .
```

# Accessibility Checkers:

## Limitations

- No Magic
  - Is the alt text meaning full?
- Static analysis
  - Will javascript make it inaccessible?
- Markup based validation
  - How will CSS affect the page?

# Colour Validation

- View in respect to Colour Blindness
- Determine Adjustability of Colours

<http://colorfilter.wickline.org>

<http://vischeck.com>



# Colour Validation

## Limitations

- Automating testing of interfaces is hard
  - e.g. determining contrast levels

This is example text. **Some of it bolded.**  
*Some of it italicized.*

Is this contrast level to spec?

# Design Early

Easier and cheaper to make good design choices early

Colour Pickers that also measure contrast

<http://gmazzocato.altervista.org/colorwheel/wheel.php>

[http://www.snook.ca/technical/colour\\_contrast/colour.html](http://www.snook.ca/technical/colour_contrast/colour.html)



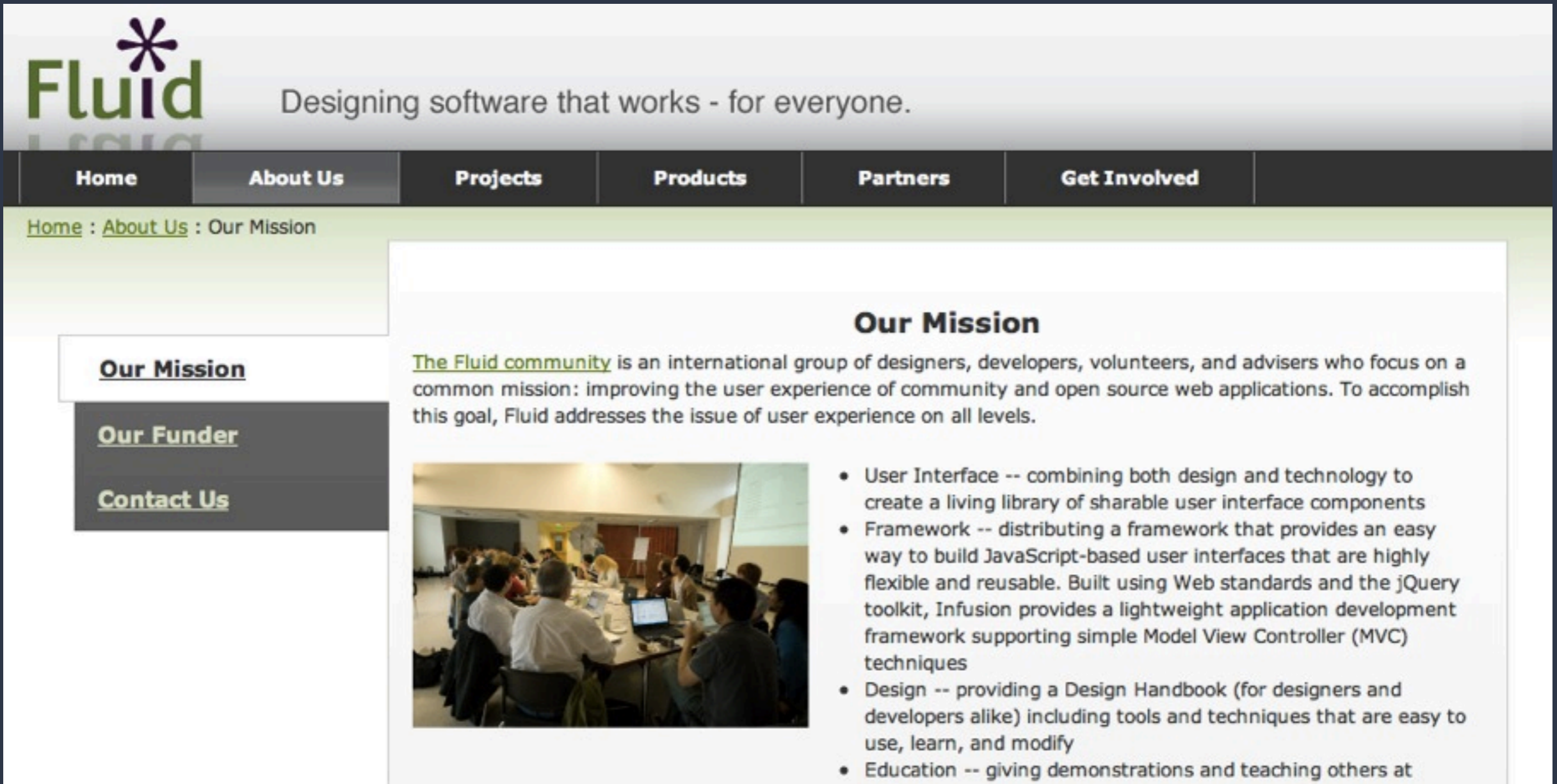
# Accessible Markup

# Concepts of HTML Accessibility

- **Label** as much as you can
- Use semantic markup to **describe** your page
- Design in **layers**
- Textual alternatives
- Clearly delineate navigation from content



# Avoiding Repetition



The screenshot shows the Fluid website's 'Our Mission' page. At the top left is the Fluid logo, a purple asterisk above the word 'Fluid' in green. To its right is the tagline 'Designing software that works - for everyone.' Below this is a dark navigation bar with links for Home, About Us, Projects, Products, Partners, and Get Involved. The 'About Us' link is highlighted. Below the navigation bar is a breadcrumb trail: 'Home : [About Us](#) : Our Mission'. On the left side, there is a vertical menu with three items: 'Our Mission' (highlighted), 'Our Funder', and 'Contact Us'. The main content area has a heading 'Our Mission' followed by a paragraph: 'The Fluid community is an international group of designers, developers, volunteers, and advisers who focus on a common mission: improving the user experience of community and open source web applications. To accomplish this goal, Fluid addresses the issue of user experience on all levels.' Below the text is a photograph of a group of people in a meeting room, some sitting at a table with laptops, others standing. To the right of the photo is a bulleted list of three items: 'User Interface -- combining both design and technology to create a living library of sharable user interface components', 'Framework -- distributing a framework that provides an easy way to build JavaScript-based user interfaces that are highly flexible and reusable. Built using Web standards and the jQuery toolkit, Infusion provides a lightweight application development framework supporting simple Model View Controller (MVC) techniques', and 'Design -- providing a Design Handbook (for designers and developers alike) including tools and techniques that are easy to use, learn, and modify'. The fourth item, 'Education -- giving demonstrations and teaching others at', is partially cut off.

**Fluid** Designing software that works - for everyone.

Home About Us Projects Products Partners Get Involved

Home : [About Us](#) : Our Mission


**Our Mission**

**Our Funder**

**Contact Us**

## Our Mission

The Fluid community is an international group of designers, developers, volunteers, and advisers who focus on a common mission: improving the user experience of community and open source web applications. To accomplish this goal, Fluid addresses the issue of user experience on all levels.



- User Interface -- combining both design and technology to create a living library of sharable user interface components
- Framework -- distributing a framework that provides an easy way to build JavaScript-based user interfaces that are highly flexible and reusable. Built using Web standards and the jQuery toolkit, Infusion provides a lightweight application development framework supporting simple Model View Controller (MVC) techniques
- Design -- providing a Design Handbook (for designers and developers alike) including tools and techniques that are easy to use, learn, and modify
- Education -- giving demonstrations and teaching others at

# Avoiding Repetition



Designing software that works - for everyone.

Home

About Us

Projects

**Navigation Bar**

Get Involved

[Our Mission](#)

[Our Funder](#)

[Contact Us](#)

## Our Mission

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# Avoiding Repetition



Designing software that works - for everyone.

Home

About Us

Projects

**Navigation Bar**

Get Involved

Home > About Us > Our Mission

**Our Mission**

**Our Funder**

**Contact Us**

## Our Mission

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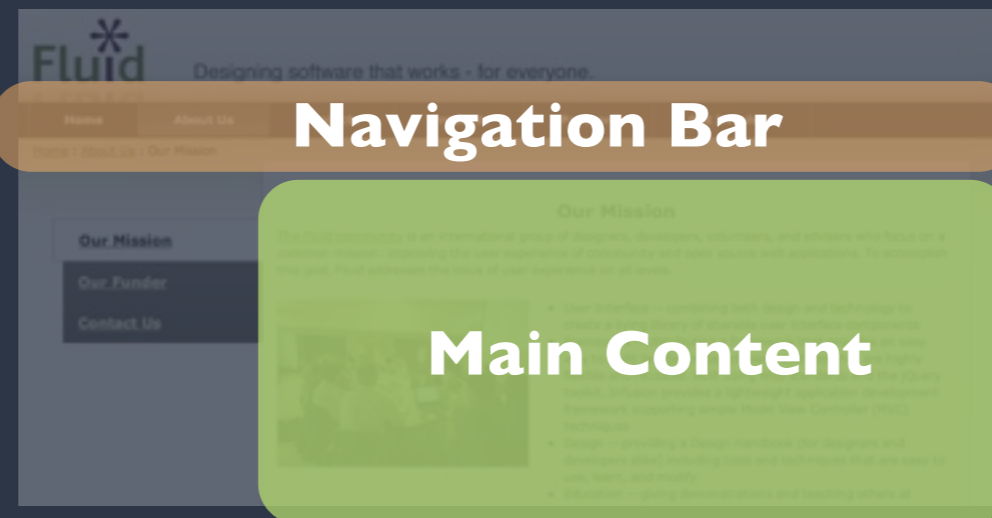


## Main Content

- User Interface -- combining both design and technology to create a living library of sharable user interface components
- Design -- providing a Design Handbook (for designers and developers alike) including tools and techniques that are easy to use, learn, and modify
- Education -- giving demonstrations and teaching others at



# Avoid Repetition



## Skip Links

```
<div id="jumplinks">  
  <a href="#content" title="Jump to content"></a>  
  <a href="#nav" title="Jump to navigation menu"></a>  
</div>
```

```
<a id="nav" title="navigation menu"></a>  
<!-- Navigation bar goes here -->  
<a title="content area" name="content"></a>  
<!-- Main page content goes here -->
```

# Designing Navigation

- Keep in mind that keyboard navigation is:
  - not just for screen reader users
  - is linear and 1-dimensional
  - can be slow and tedious
- Skip links should be available and **visible to all**
- Place them as high in the page as possible

# Navigable Headings



Designing software that works - for everyone.

## Fluid Daily Build Resources

The demonstration sites available below are updated from SVN nightly. Changes made during the day will not necessarily be available until the following day.

Interactive demos are now available on our [demo portal](#)

## Fluid Integration Examples

The following examples illustrate more than one Fluid component, integrated into real-world settings.

### uPortal Instance

- [Demo uPortal site](#)

This is a live instance of uPortal, built from their trunk nightly. It incorporates the following Infusion features:

- *Fluid Skinning System* The uPortal interface is styled using the Fluid Skinning System (FSS).
- *Layout Reorderer* The portlets are reorderable using the Infusion Layout Reorderer.
- *Pager* If you log in as "admin" and choose the "Portlet Manager" in the right sidebar, the list of registered portlets is paged using the Infusion Pager.
- As well, if you choose "Add Content" in the right sidebar, you can add the "Javascript Demos" portlet (in the Applications section) which

## Infrastructure

- [Continuum Build Server](#)
- [Unit Tests](#)
- [Manual Tests](#)

## Infusion Builder

- ["Infusion Builder Demo"](#)
- [Unit Tests: JavaScript Unit Tests](#)
- [Unit Tests: PHP - Builder Utilities Test](#)
- [Unit Tests: PHP - Group Class Test](#)
- [Unit Tests: PHP - Module Class Test](#)
- [Unit Tests: PHP - Post Class Test](#)

## Engage Demos

These are best viewed in **Safari 4**

- [Fluid Engage Mobile](#)



# Navigable Headings



## Level One

Designing software that works - for everyone.

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- Continuum Build Server
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- Manual Tests

### Infusion Builder

- "Infusion Builder Demo"
- Unit Tests: JavaScript Unit Tests
- Unit Tests: PHP - Builder Utilities Test
- Unit Tests: PHP - Group Class Test
- Unit Tests: PHP - Module Class Test
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### Engage Demos

These are best viewed in **Safari 4**

- Fluid Engage Mobile



# Navigable Headings

## Level One

## Level Two

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# Navigable Headings

## Level One

## Level Two

The demonstration sites available below are updated from SVN nightly. Changes made during the day will not necessarily be available until the following day.

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## Level Three

The following examples illustrate more than one Fluid component, integrated into real-world settings.

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- Unit Tests
- Manual Tests

## Level Three

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- Unit Tests: PHP - Builder Utilities Test
- Unit Tests: PHP - Group Class Test
- Unit Tests: PHP - Module Class Test
- Unit Tests: PHP - Post Class Test

## Level Three

These are best viewed in **Safari 4**



# Navigable Headings

## Level One

## Level Two

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## Level Three

The following examples illustrate more than one Fluid component, integrated into real-world settings.

## Level Four

- Demo uPortal site

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## Level Three

- Continuum Build Server
- Unit Tests
- Manual Tests

## Level Three

- "Infusion Builder Demo"
- Unit Tests: JavaScript Unit Tests
- Unit Tests: PHP - Builder Utilities Test
- Unit Tests: PHP - Group Class Test
- Unit Tests: PHP - Module Class Test
- Unit Tests: PHP - Post Class Test

## Level Three

These are best viewed in **Safari 4**



# Navigable Headings



Designing software that works - for everyone.

<H1>

Fluid Daily Build Resources

<H2>

The demonstration sites available below are updated from SVN nightly. Changes made during the day will not necessarily be available until the following day.

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Fluid Integration Examples

<H3>

The following examples illustrate more than one Fluid component, integrated into real-world settings.

uPortal site

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<H3>

- Continuum Build Server
- Unit Tests
- Manual Tests

<H3>


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- Unit Tests: PHP - Group Class Test
- Unit Tests: PHP - Module Class Test
- Unit Tests: PHP - Post Class Test

<H3>

These are best viewed in **Safari 4**



# Navigating Headings

**Fluid**  Designing software that works - for everyone.

## Fluid Daily Build Resources

The demonstration sites available below are updated from SVN nightly. Changes made during the build process are visible here.

**Interactive demos are now available**

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The following examples illustrate more than one Fluid component, integrated into real-world settings.

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### Infusion

- Content
- Unit
- Manu

### Engage

These are

• Fluid

### Heading List

Fluid : Designing Software that works - For everyon...

Fluid Daily Build Resources : 2

Fluid Integration Examples : 3

uPortal Instance : 4

Sakai Mock-up : 4

uPortal 3 Mock-up : 4

Infrastructure : 3

Infusion Builder : 3

Engage Demos : 3

**Sort Headings**

In Tab Order

Alphabetically

**Display**

All Headings

Level1 Headings

Level2 Headings

Level3 Headings

Level4 Headings

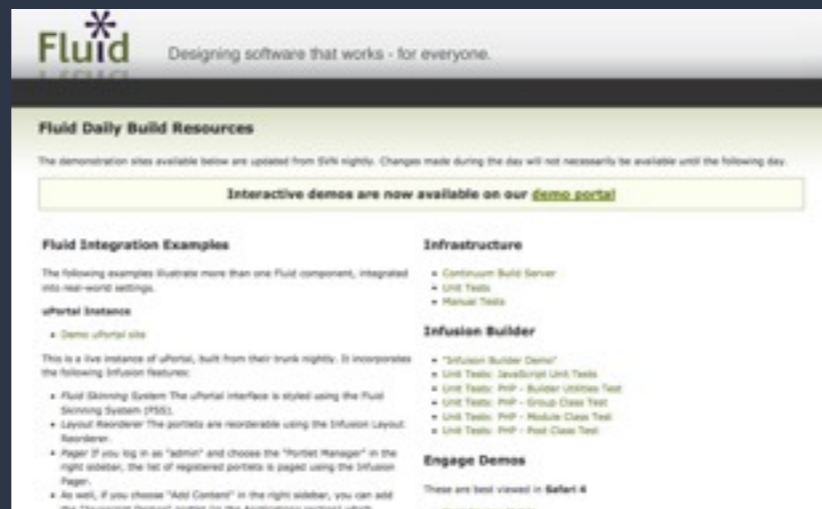
Level5 Headings

Level6 Headings

[Move To Heading](#)

[Cancel](#)

# Navigable Headings



```
<body>
```

```
  <h1>Fluid: Designing Software that works - For everyone.</h1>
```

```
  <h2>Fluid Daily Build Resources</h2>
```

```
    <div>
```

```
      <div class="fl-col">
```

```
        <h3>Fluid Integration Examples</h3>
```

```
          <h4>uPortal Instance</h4>
```

```
          <-- Content goes here -->
```

```
          <h4>Sakai Mock-up</h4>
```

```
        </div>
```

```
      <div class="fl-col">
```

```
        <h3>Infrastructure</h3>
```

```
        ...
```



# Labelling Forms

**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

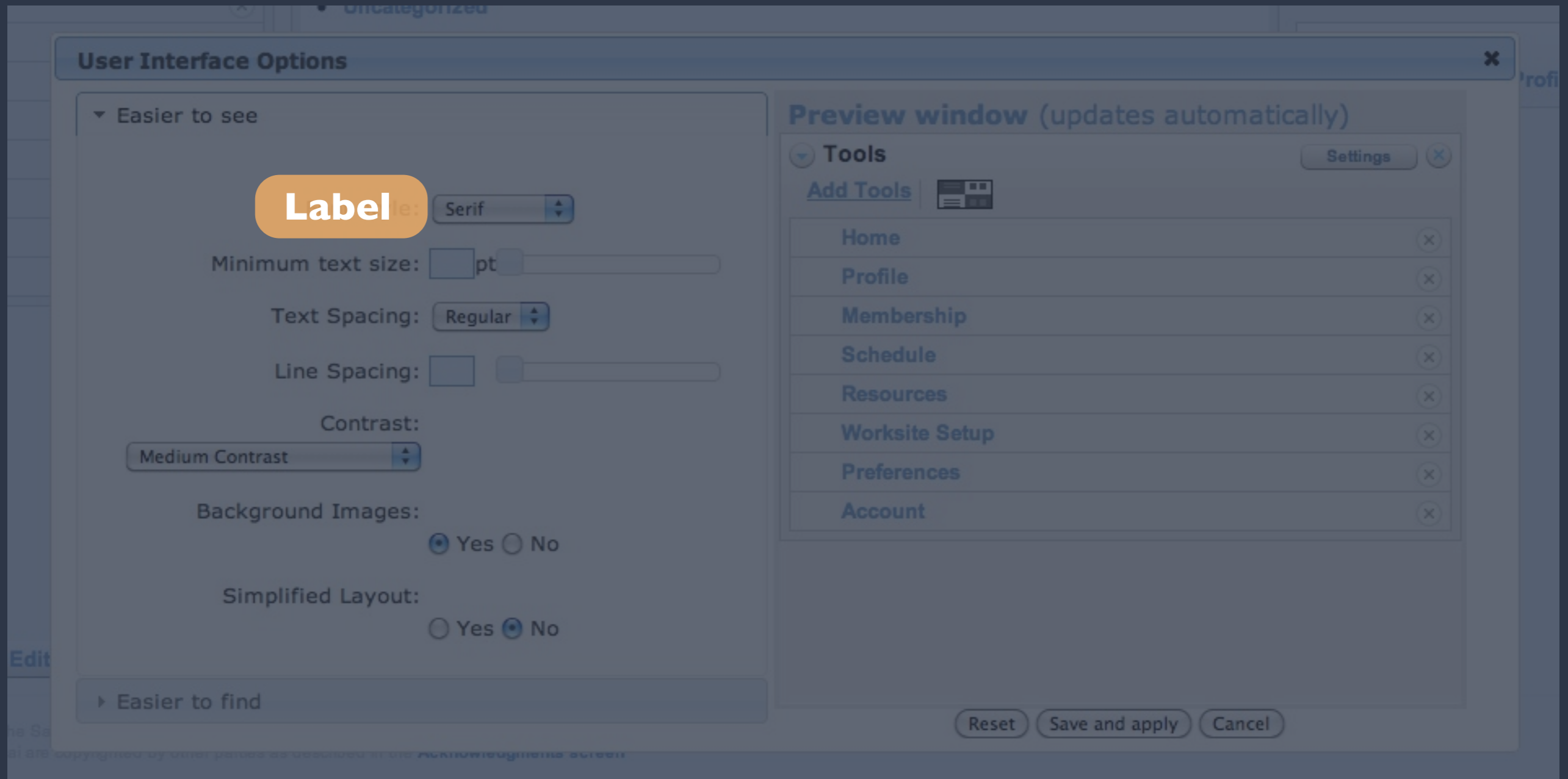
**Preview window (updates automatically)**

Tools

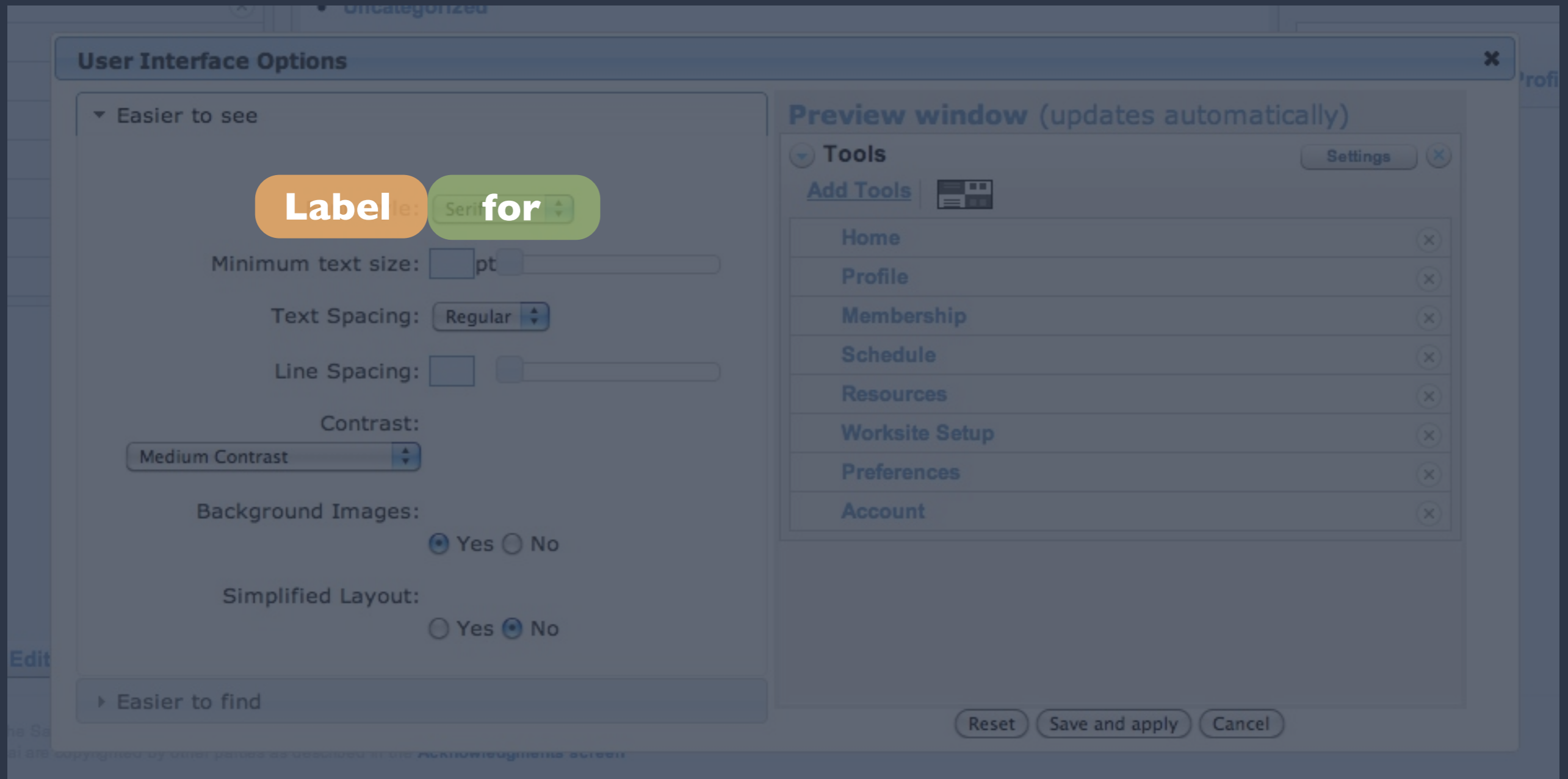
[Add Tools](#)

Home	<input type="button" value="x"/>
Profile	<input type="button" value="x"/>
Membership	<input type="button" value="x"/>
Schedule	<input type="button" value="x"/>
Resources	<input type="button" value="x"/>
Worksite Setup	<input type="button" value="x"/>
Preferences	<input type="button" value="x"/>
Account	<input type="button" value="x"/>

# Labelling Forms

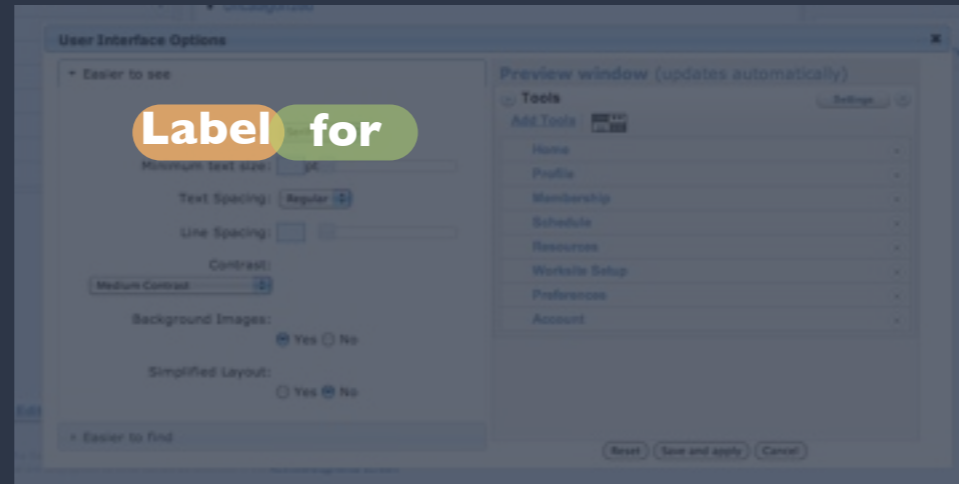


# Labelling Forms





# Labelling Forms



<li>

```
<label for="text-font">Font style:</label>
```

```
<select id="text-font" name="text-font-selection">
```

```
  <option value="serif">Serif</option>
```

```
  <option value="sansSerif">Sans-Serif</option>
```

```
  <option value="arial">Arial</option>
```

```
  <option value="verdana">Verdana</option>
```

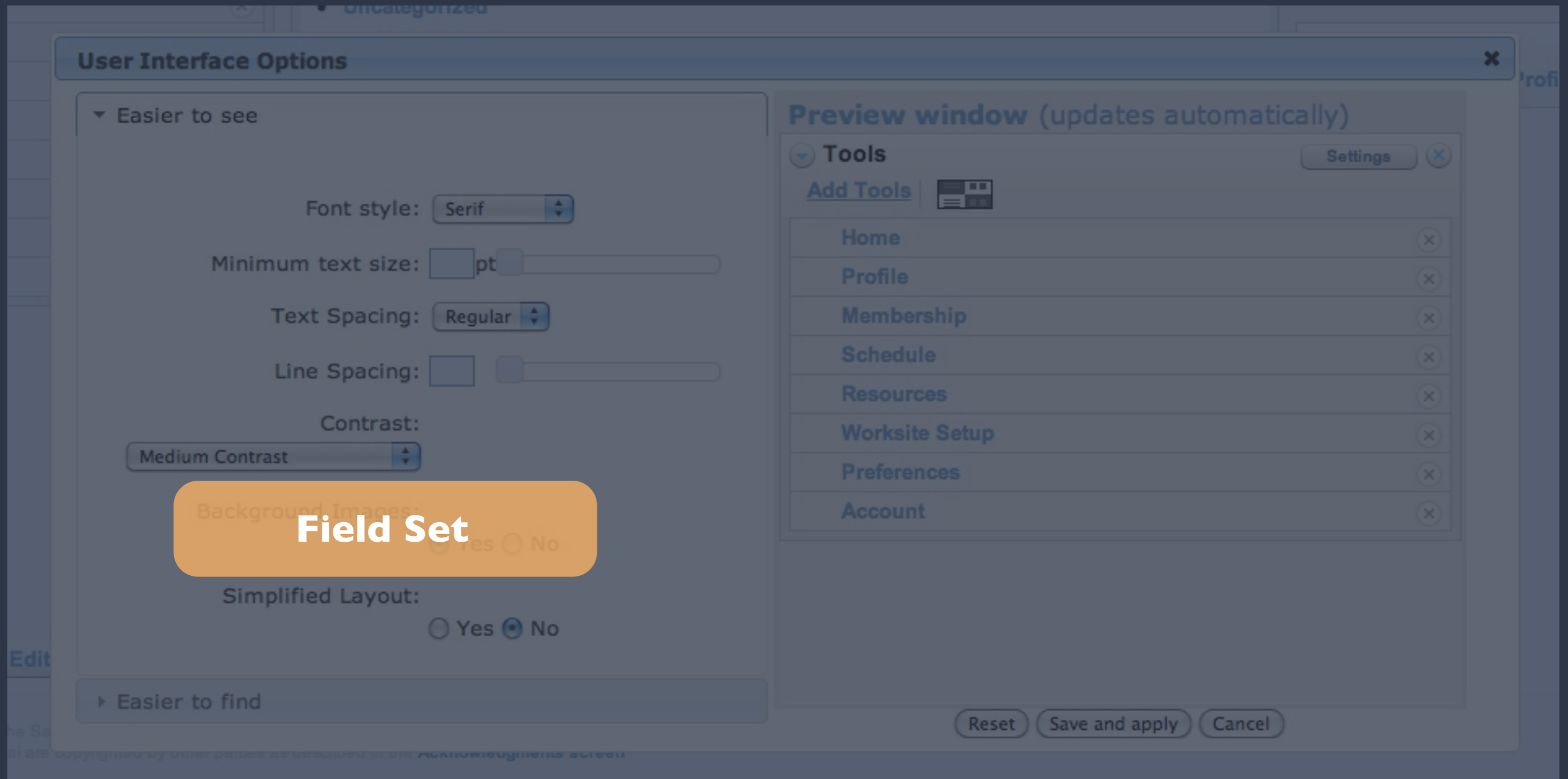
```
  <option value="courier">Courier</option>
```

```
  <option value="times">Times</option>
```

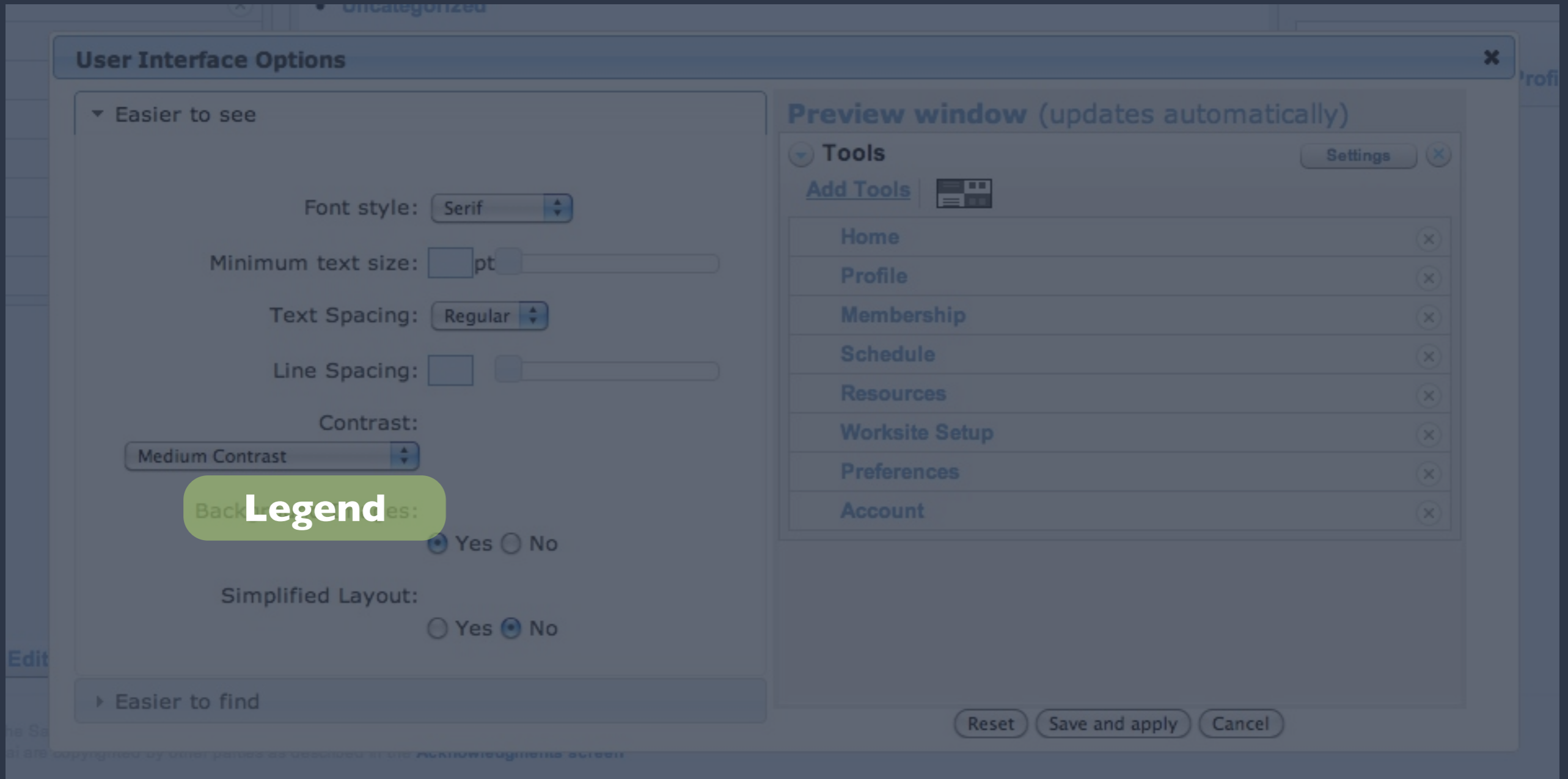
```
</select>
```

<li>

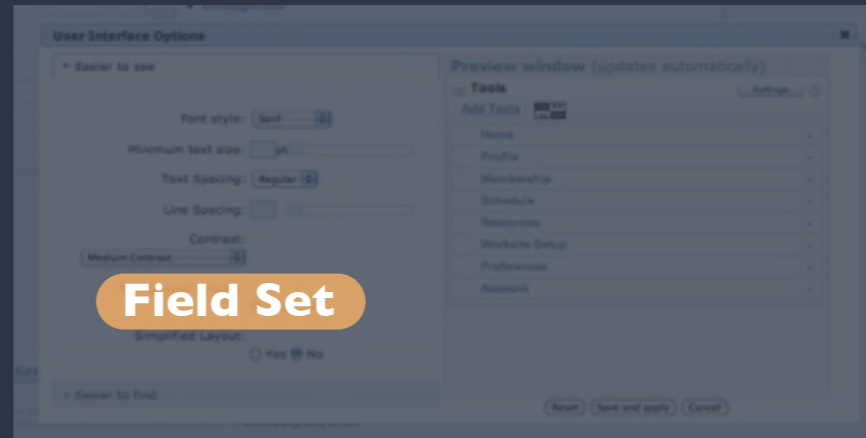
# Grouping Forms



# Grouping Forms



# Grouping Forms



```
<fieldset>
  <legend>Background Images</legend>
  <span>
    <input type="radio" value="true" checked="checked"
      name="background-images-selection" id="background-yes">
    <label for="background-yes">Yes</label>
  </span>
  <span>
    <input type="radio" value="false" name="background-images-selection"
      id="background-no">
    <label for="background-no">No</label>
  </span>
</fieldset>
```

# Tables

- Tables got a really bad rap in the '90s
- Deservedly so
- Use them for data, *not layouts*
- They can be big: summarize them
- Seriously, you don't need them for layouts

# Grouping Forms

1 2 3 4 5 6 7 (last) < previous [next >](#) Show  per page

Name	User Id	Points	Comments
Ahn, Jason	15234314	87	Lorem ipsum dolor sit amet.
Akerman, Krista	19206726	79	Consectetur adipiscing elit.
Almeida, Elaine	19286942	92	Suspendisse eu.
Azer, Tamer	19446940	68	
Bandali, Salim	19283721	69	Ut egestas, urna at rhoncus gravida, nisl nisi condimentum pede.

1 2 3 4 5 6 7 (last) < previous [next >](#) 1-5 of 32 items

**Header**

**Body**

# Table Structure

The image shows a screenshot of a web application table. The table has a header row highlighted in orange and a body of rows highlighted in green. The header row contains the following text: 'Name', 'User ID', 'Points', and 'Comments'. The body rows contain the following data: 'Ahn, Jason', '15234314', '87', and 'Lorem ipsum dolor sit amet.'. The table is part of a larger interface with pagination controls at the top and bottom.

Name	User ID	Points	Comments
Ahn, Jason	15234314	87	Lorem ipsum dolor sit amet.
Alarman, Krista	19206726	79	Consectetur adipiscing elit.
Almeida, Elaine	19286942	92	Suspendisse ut arcu.
Azer, Tamer	19446940	88	
Bandak, Salim	19283721	89	Ut egestas, urna ut rhoncus gravida, risi nisi condimentum pede.

```
<table summary="An editable table of student grades and  
instructor comments.">
```

```
<thead>
```

```
<tr>
```

```
<th>Name</th>
```

```
<th abbr="I.D.">User ID</th>
```

```
<th>Points</th>
```

```
<th>Comments</th>
```

```
</tr>
```

```
</thead>
```

```
<tbody>
```

```
<tr>
```

```
<td>Ahn, Jason</td>
```

```
<td>15234314</td>
```

```
<td><input type="text" name="points" value="87"></td>
```

```
<td>Lorem ipsum dolor sit amet.</td>
```

```
</tr>
```

```
</tbody>
```

```
</table>
```

# what is “alt” text?

- It is read by screen readers in place of images allowing the content and function of the image to be accessible to those with visual or certain cognitive disabilities.
- It is displayed in place of the image in user agents (browsers) that don't support the display of images or when the user has chosen not to view images.
- It provides a semantic meaning and description to images which can be read by search engines or be used to later determine the content of the image from page context alone.



# The “alt” attribute

- Be accurate and equivalent in presenting the same content and function as presented by the image.
- Be succinct. Typically no more than a few words are necessary.
- NOT be redundant or provide the exact same information as text within the context.
- NOT use the phrases "image of ..." or "graphic of ..." to describe the image. It usually appears to the user that it is an image.

# “alt” text in code

```

```

# Alternatives to Images



## Alt Text

```

```

## Background Images + Real Text

```
<a href="http://fluidproject.org/products/infusion/download-infusion" title="Download Fluid Infusion">
  Download Infusion
</a>
```



# Web 2.0 Accessibility

# DHTML: A New Can of Worms

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

# 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

# How assistive technologies work





# Assistive Technologies

- Present and control the user interface in different ways
- Not just screen readers!
- Use built-in operating system APIs to understand the user interface

Screen readers  
Screen magnifiers  
On-screen keyboards

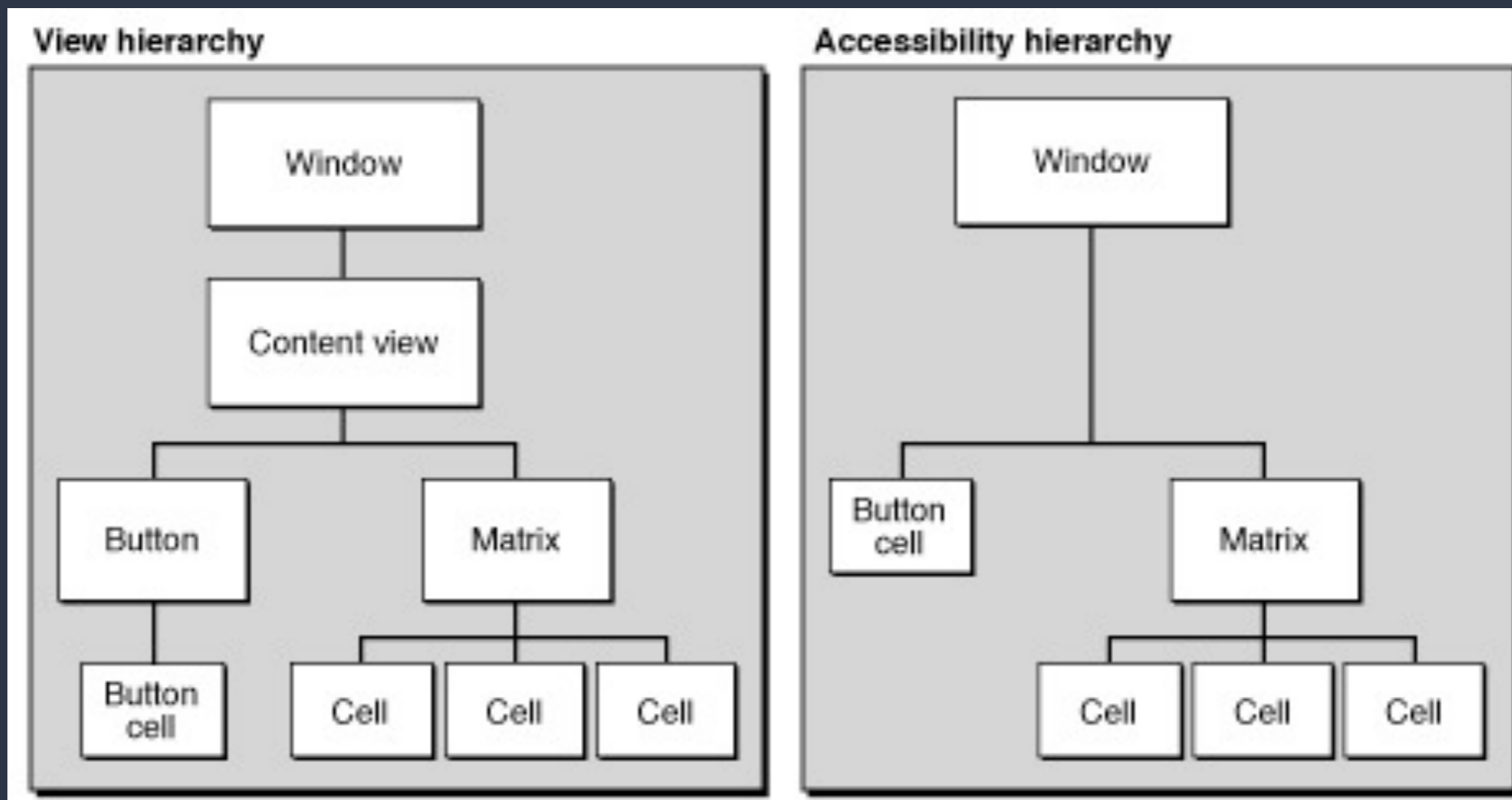
# OS AT APIs

- A channel for UI introspection
- What's on screen?
- How are things labelled, organized, etc.?
- What states are things in?
- UI Roles, states, properties

# The Role-Based Model

- Most platform APIs work the same way
- Give each UI widget a name
- e.g. *slider, tabs, dialog, button, text field*
- Names imply behaviour
- For AT users, names define interactions

# View Hierarchies





# Supporting Assistive Technology



# Opaque Markup

```
// These are tabs. How would you know?
<ol>
  <li id="ch1Tab">
    <a href="#ch1Panel">CHAPTER 1</a>
  </li>
  <li id="ch2Tab">
    <a href="#ch2Panel">CHAPTER 2</a>
  </li>
  <li id="quizTab">
    <a href="#quizPanel">QUIZ</a>
  </li>
</ol>
<div>
  <div id="ch1Panel">Chapter 1 Stuff</div>
  <div id="ch2Panel">Chapter 2 Stuff</div>
  <div id="quizTab">Quiz Stuff</div>
</div>
```

# Opaque Markup: Tabs

CHAPTER 1

CHAPTER 2

QUIZ

## Chapter 1 Prolegomena

### What is logic?

---

Logic is the study of the consistency of beliefs. For beliefs to be consistent it must be possible for them to obtain at the same time. For example, it is illogical to believe that the sky is completely blue and that the sky is completely red because the sky being entirely blue is inconsistent with its being entirely red, i.e. it is not possible for the sky to be entirely red at the same time as its being entirely blue.

Logic is also a study of "logical consequence", i.e. what follows by necessity from something else. By studying inconsistency of beliefs, philosophers are able to study the validity of arguments, as will be shown later. Methods of finding whether certain arguments are valid is described later.

The symbolisation of these sentences, known as formalisation, simplifies and quickens this process. It also enables the philosopher to clarify ideas using an unambiguous language in which to represent thoughts. The sophistication of the language used enables greater insights into the significance of these thoughts (and a cursory analysis of more logical languages is described in Other Logics).



# ARIA

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

# Roles, States, Properties

- **Roles** describe widgets not present in HTML 4
  - slider, menubar, tab, dialog
- **Properties** describe characteristics:
  - draggable, hasPopup, required
- **States** describe what's happening:
  - busy, disabled, selected, hidden

# Using ARIA

```
// Now *these* are Tabs!
<ol role="tablist" tabindex="0">
  <li id="ch1Tab" role="tab"><a href="#ch1Panel" tabindex="-1">CHAPTER 1</a></li>
  <li id="ch2Tab" role="tab"><a href="#ch2Panel" tabindex="-1">CHAPTER 2</a></li>
  <li id="quizTab" role="tab"><a href="#quizPanel">QUIZ</a></li>
</ol>
<div>
  <div id="ch1Panel" role="tabpanel" aria-labelledby="ch1Tab">Chapter 1 Stuff</div>
  <div id="ch2Panel" role="tabpanel" aria-labelledby="ch2Tab">Chapter 2 Stuff</div>
  <div id="quizTab" role="tabpanel" aria-labelledby="quizTab">Quiz Stuff</div>
</div>
```

# Breaking it Down

```
<ol>
  <li>CHAPTER 1</li>
  <li>CHAPTER 2</li>
  <li>QUIZ</li>
</ol>
<div>
  <div>Chapter 1 Stuff</div>
  <div>Chapter 2 Stuff</div>
  <div>Quiz Stuff</div>
</div>
```

# Progressive Enhancement

# Graceful Degradation



# Make it work without JavaScript

```
<ol>
  <li><a href="#ch1Panel">CHAPTER 1</a></li>
  <li><a href="#ch2Panel" tabindex="-1">CHAPTER 2</a></li>
  <li><a href="#quizPanel">QUIZ</a></li>
</ol>
<div>
  <div id="ch1Panel">Chapter 1 Stuff</div>
  <div id="ch2Panel">Chapter 2 Stuff</div>
  <div id="quizTab">Quiz Stuff</div>
</div>
```

# Adding ARIA in Code

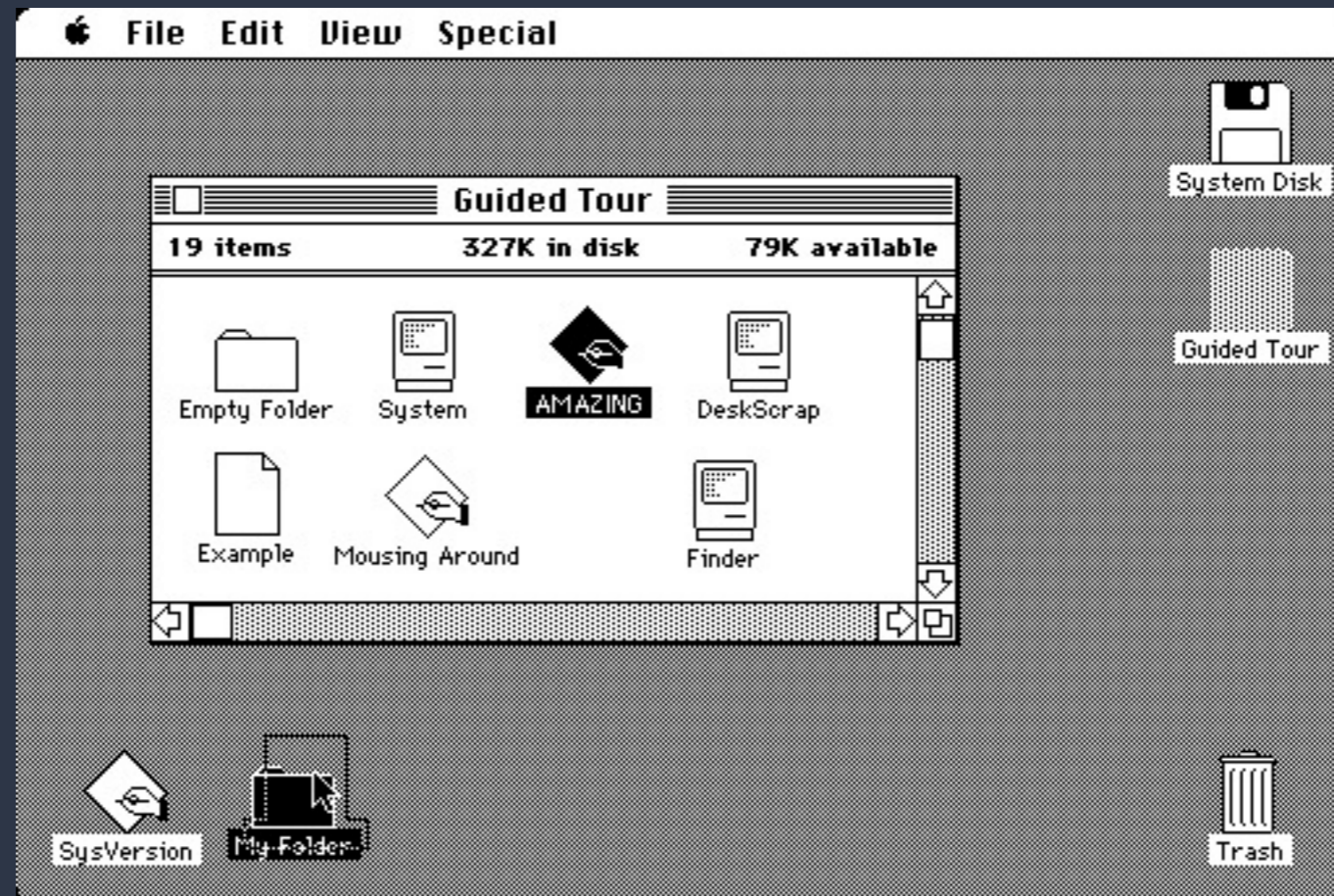
```
// Identify the container as a list of tabs.
tabContainer.attr("role", "tablist");

// Give each tab the "tab" role.
tabs.attr("role", "tab");

// Give each panel the appropriate role,
panels.attr("role", "tabpanel");
panels.each(function (idx, panel) {
    var tabForPanel = that.tabs.eq(idx);
    // Relate the panel to the tab that labels it.
    $(panel).attr("aria-labelledby", tabForPanel[0].id);
});
```



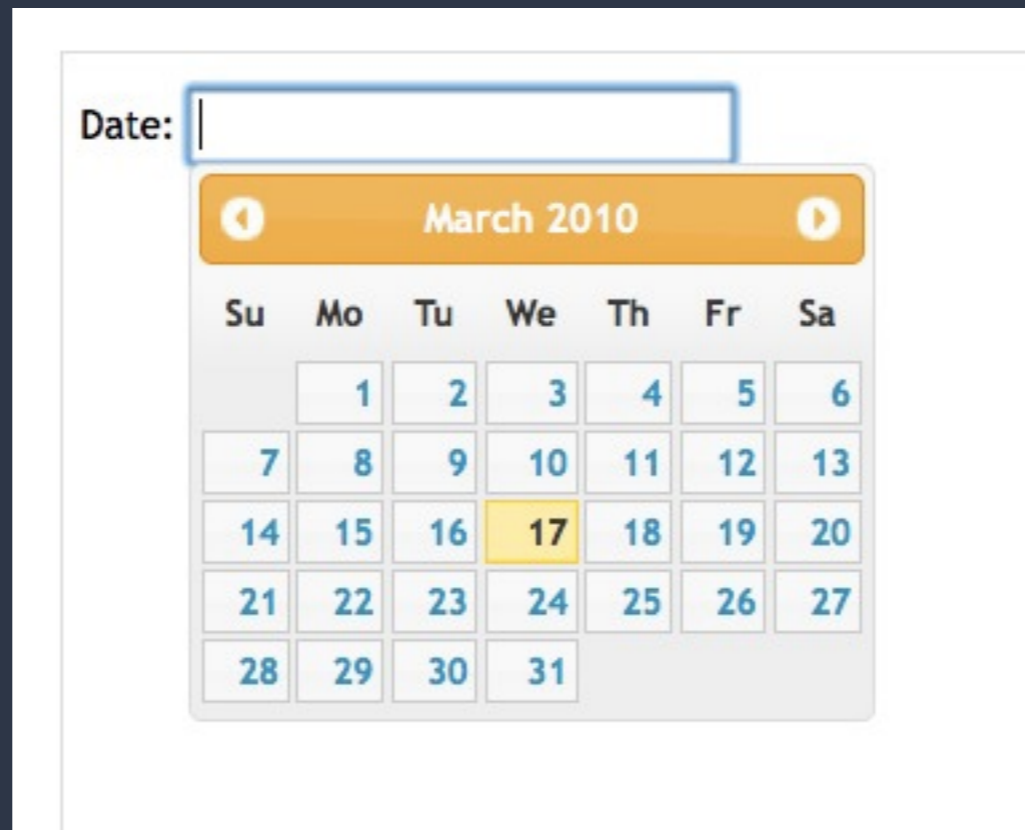
# The Problem with Roles



Roles are driven by 1980's era desktop widgets

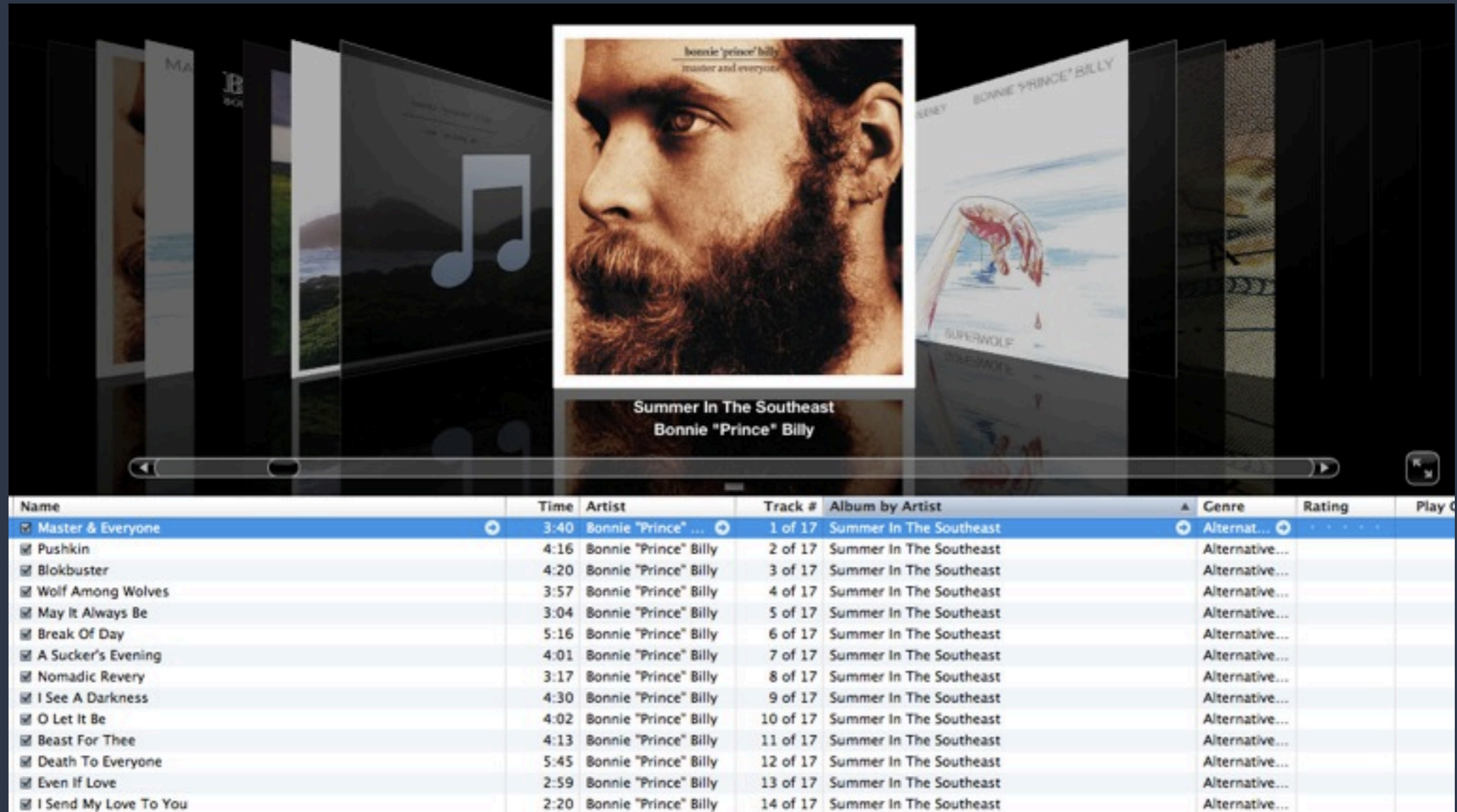


# The Problem with Roles



The Web is driving hybrid UIs

# The Problem with Roles



The screenshot shows a music player interface with a central album cover for Bonnie "Prince" Billy's "Summer In The Southeast". Below the cover is a playlist table with columns for Name, Time, Artist, Track #, Album by Artist, Genre, Rating, and Play C.

Name	Time	Artist	Track #	Album by Artist	Genre	Rating	Play C
<input checked="" type="checkbox"/> Master & Everyone	3:40	Bonnie "Prince" ...	1 of 17	Summer In The Southeast	Alternat...		
<input checked="" type="checkbox"/> Pushkin	4:16	Bonnie "Prince" Billy	2 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Blokbuster	4:20	Bonnie "Prince" Billy	3 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Wolf Among Wolves	3:57	Bonnie "Prince" Billy	4 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> May It Always Be	3:04	Bonnie "Prince" Billy	5 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Break Of Day	5:16	Bonnie "Prince" Billy	6 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> A Sucker's Evening	4:01	Bonnie "Prince" Billy	7 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Nomadic Revery	3:17	Bonnie "Prince" Billy	8 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> I See A Darkness	4:30	Bonnie "Prince" Billy	9 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> O Let It Be	4:02	Bonnie "Prince" Billy	10 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Beast For Thee	4:13	Bonnie "Prince" Billy	11 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Death To Everyone	5:45	Bonnie "Prince" Billy	12 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> Even If Love	2:59	Bonnie "Prince" Billy	13 of 17	Summer In The Southeast	Alternative...		
<input checked="" type="checkbox"/> I Send My Love To You	2:20	Bonnie "Prince" Billy	14 of 17	Summer In The Southeast	Alternative...		

... even on the desktop

# Analyzing User Interfaces

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...

The quick **brown fox jumped over** the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...

The quick **brown fox jumped over|** the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

# Inline Edit Roles

Button?

The quick brown fox jumped over the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The over quick brown fox jumped the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The quick brown fox over jumped the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The quick brown fox jumped over the lazy dogs and then...

The over quick brown fox jumped the lazy dogs and then...

# Inline Edit Roles

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...

The quick **brown fox jumped over** the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...

The quick **brown fox jumped over** the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

Text Field?

# Inline Edit Roles

Button?

Text Field?

# Inline Edit Behaviours

Read-only

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...

The quick **brown fox jumped** over the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

The quick brown fox jumped **over the lazy dogs** and then...

The quick brown fox **over jumped the lazy** dogs and then...


The quick **brown fox jumped over|** the lazy dogs and then...

The quick brown fox jumped over the **lazy dogs** and then...

The over **quick** brown fox jumped the lazy dogs and then...

Activatable

Editable

Sections	
Inclusive Design <a href="#">Assign GSIs</a>   <a href="#">Assign Students</a>	 Melissa Julie Ch
Astronomy 7A S 102 EC	Rachel I

Undoable

# 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

[http://dev.aol.com/dhtml\\_style\\_guide](http://dev.aol.com/dhtml_style_guide)



# 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. A lot of code.

# Keyboard a11y: Tabs

CHAPTER 1

CHAPTER 2

QUIZ

## Chapter 1 Prolegomena

[Original chapter from Wikibooks](#)

### What is logic?

---

Logic is the study of the consistency of beliefs. For beliefs to be consistent it must be possible for them to obtain at the same time. For example, it is illogical to believe that the sky is completely blue and that the sky is completely red because the sky being entirely blue is inconsistent with its being entirely red, i.e. it is not possible for the sky to be entirely red at the same time as its being entirely blue.

Logic is also a study of "logical consequence", i.e. what follows by necessity from something else. By studying inconsistency of beliefs, philosophers are able to study the validity of arguments, as will be shown later. Methods of finding whether certain arguments are valid is described later.

The symbolisation of these sentences, known as formalisation, simplifies and quickens this process. It also enables the philosopher to clarify ideas using an unambiguous language in which to represent thoughts. The sophistication of the language used enables greater insights into the significance of these thoughts (and a cursory analysis of more logical languages is described in Other Logics).

# TabIndex examples

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



# Making Things Tabbable

- Tabindex varies subtly across browsers
- `jquery.attr()` normalizes it as of 1.3
- For all the gory details:

[http://fluidproject.org/blog/2008/01/09/  
getting-setting-and-removing-tabindex-values-with-javascript/](http://fluidproject.org/blog/2008/01/09/getting-setting-and-removing-tabindex-values-with-javascript/)

```
// Make the tablist accessible with the Tab key.  
tabContainer.attr("tabindex", "0");  
// And take the anchors out of the Tab order.  
$("a", tabs).attr("tabindex", "-1");
```



# Adding the Arrow Keys

```
// Make each tab accessible with the left and right arrow keys.
tabContainer.fluid("selectable", {
  selectableSelector: "li",
  direction: fluid.a11y.orientation.HORIZONTAL,
  onSelect: function (tab) {
    $(tab).addClass(that.options.styles.highlighted);
  },

  onUnselect: function (tab) {
    $(tab).removeClass(that.options.styles.highlighted);
  }
});
```



# Making Them Activatable

```
// Make each tab activatable with Spacebar and Enter.  
tabs.fluid("activatable", function (evt) {  
    // Your handler code here. Maybe the same as .click()?  
});
```



# Documentation

- **Tutorial:**

<http://wiki.fluidproject.org/display/fluid/Keyboard+Accessibility+Tutorial>

- **API Reference:**

<http://wiki.fluidproject.org/display/fluid/Keyboard+Accessibility+Plugin+API>





# 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/Accessible_DHTML)

[http://developer.mozilla.org/en/docs/Key-navigable\\_custom\\_DHTML\\_widgets](http://developer.mozilla.org/en/docs/Key-navigable_custom_DHTML_widgets)

[http://developer.mozilla.org/en/docs/AJAX:WAI\\_ARIA\\_Live\\_Regions](http://developer.mozilla.org/en/docs/AJAX:WAI_ARIA_Live_Regions)



# Building with FSS



# CSS Frameworks

- “If you’re going to use a framework, it should be yours; one that you’ve created. You can look at existing frameworks for ideas and hack at it. But the professionals in this room are not well served by picking up a framework and using it as-is.”
- - Eric Meyer

# Fluid Skinning System

- FSS is built to be hacked on
- Provides a core set of building blocks
- Reset, text, layouts, themes
- Namespaced: no conflicts with your stuff
- Themes for better legibility & readability

<http://wiki.fluidproject.org/x/96M7>



# Dynamic Skinning

Demo UI Options?





# UI Options

**My Dashboard**

**User Interface Options**

**Easier to see**

Font style: **Serif**

Minimum text size:  pt

Text Spacing: **Regular**

Line Spacing:

Contrast: **Medium Contrast**

Background Images:  Yes  No

Simplified Layout:  Yes  No

**Easier to find**

**Preview window (updates automatically)**

**Tools**

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

**Reset** **Save and apply** **Cancel**

**Add Widgets** **Edit Appearance**

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**fluidengage**



# UI Options

My Dashboard

### User Interface Options

▼ Easier to see

Font style:

Minimum text size:  px

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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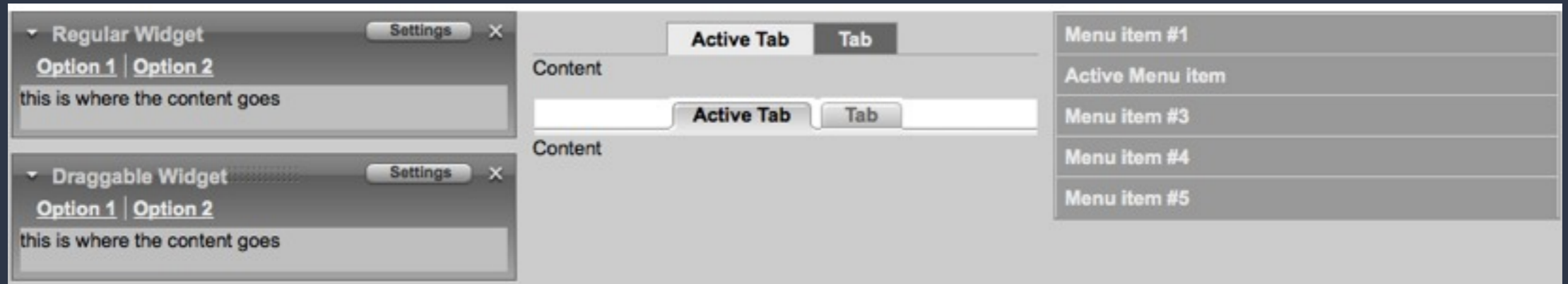
# Code!



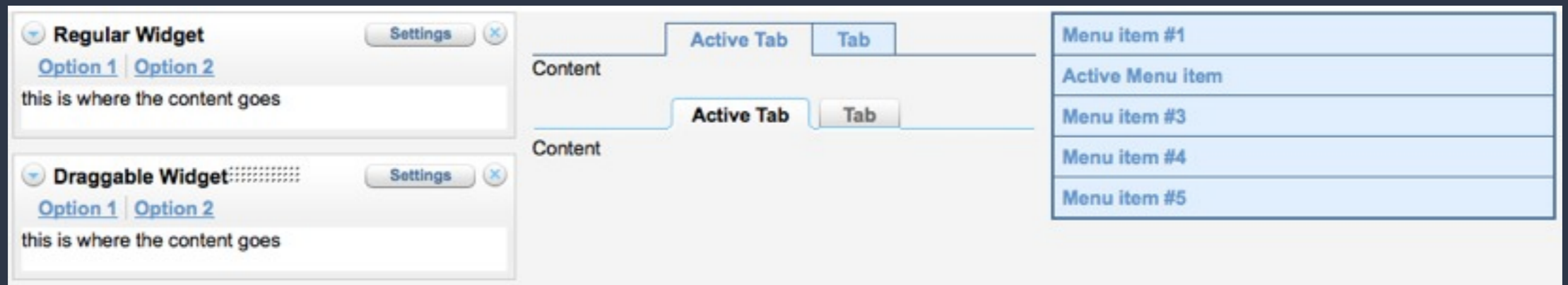


# FSS Themes

## Slate



## Mist



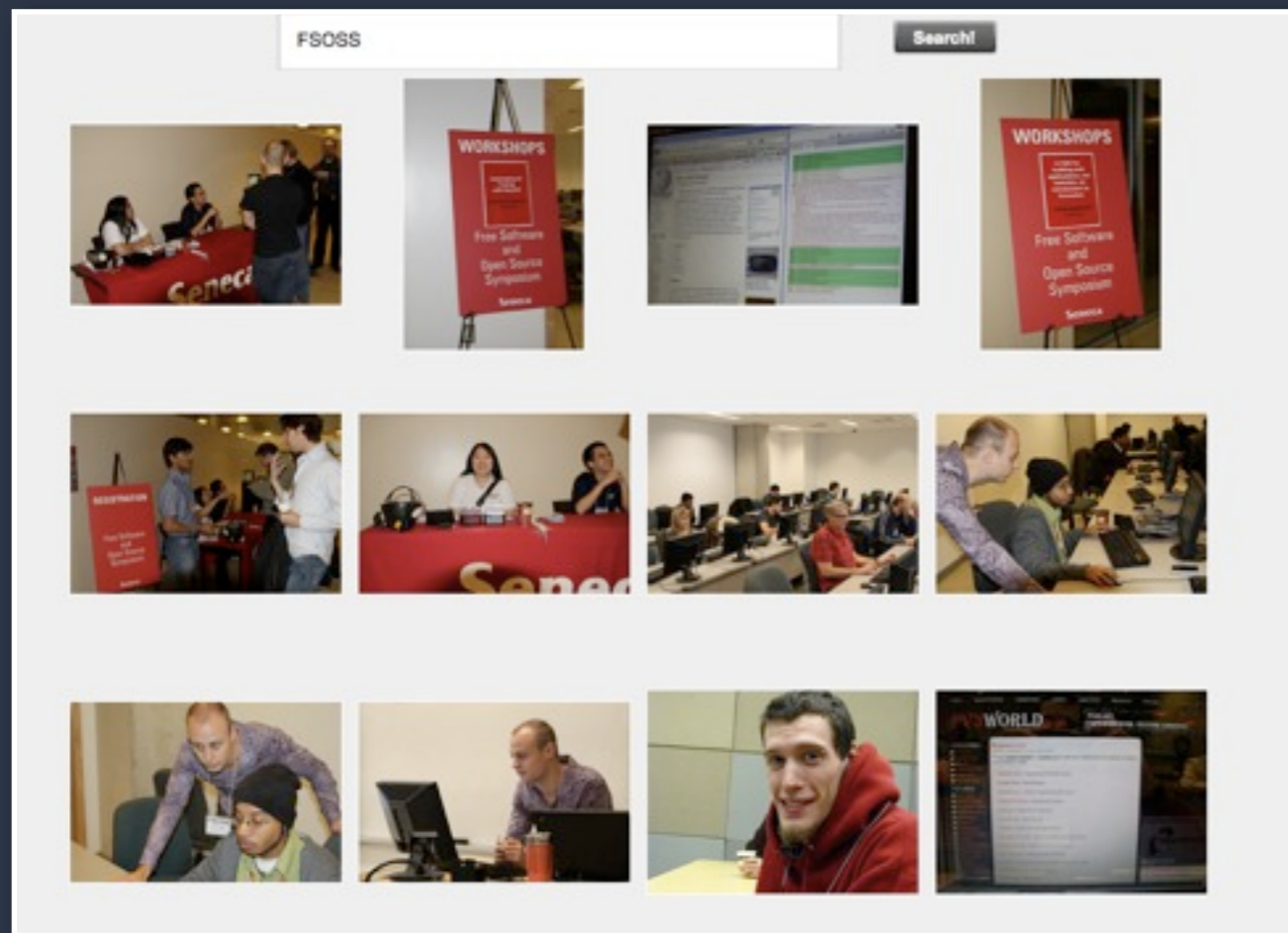
## High Contrast



# Mobile FSS Applied

.fl-theme-coal

.fl-theme-iphone



=



# mFSS: iPhone Theme

```
<head>  
  <link type="text/css" rel="stylesheet"  
    href="fss-mobile-layout.css" />      <link  
type="text/css" rel="stylesheet"  
  href="fss-mobile-theme-iphone.css" /></head>  
  
<body class="fl-theme-iphone">  
  
</body>
```



# mFSS: Android Theme

```
<head>  
  <link type="text/css" rel="stylesheet"  
    href="fss-mobile-layout.css" />      <link  
type="text/css" rel="stylesheet"  
  href="fss-mobile-theme-android.css" /></head>  
  
<body class="fl-theme-android">  
  
</body>
```



# mFSS: Desktop

```
<head>
  <link type="text/css" rel="stylesheet"
        href="fss-layout.css" />      <link
type="text/css" rel="stylesheet"
        href="fss-theme-rust.css" /></head>
<body class="fl-theme-rust">

</body>
```



# FSS: Desktop

```
<head>
  <link type="text/css" rel="stylesheet"
        href="fss-layout.css" />      <link
type="text/css" rel="stylesheet"
        href="fss-theme-slate.css" /></head>
<body class="fl-theme-slate">

</body>
```

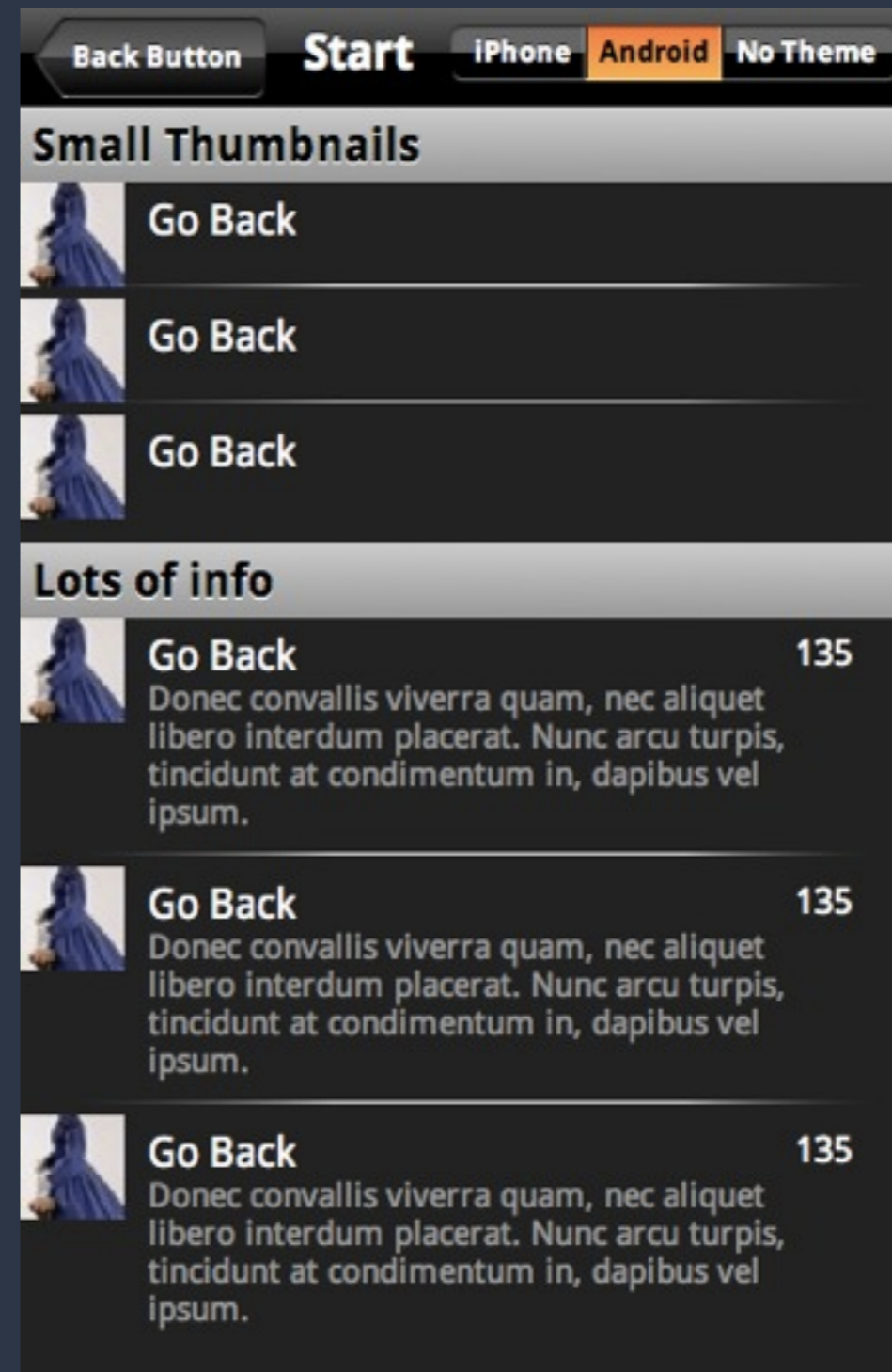


# mFSS Themes

## iPhone



## Android



# mFSS: iPhone Theme

```
<head>
  <link type="text/css" rel="stylesheet"
        href="fss-mobile-layout.css" />
  <link type="text/css" rel="stylesheet"
        href="fss-mobile-theme-iphone.css" /></head>
<body class="fl-theme-iphone">

</body>
```





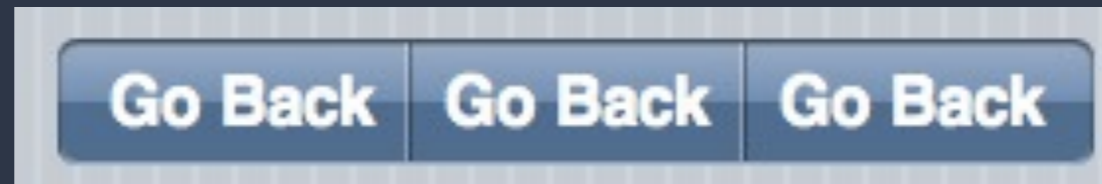
# mFSS: Android Theme

```
<head>
  <link type="text/css" rel="stylesheet"
        href="fss-mobile-layout.css" />
  <link type="text/css" rel="stylesheet"
        href="fss-mobile-theme-android.css" /></head>
<body class="fl-theme-android">

</body>
```



# FSS: Tabs



```
<ul class="fl-tabs"> <li class="fl-tabs-active">
  <a href="#">Go Back</a>
</li> <li>
  <a href="#">Go Back</a>
</li> <li>
  <a href="#">Go Back</a>
</li>
</ul>
```

# mFSS: Back Button



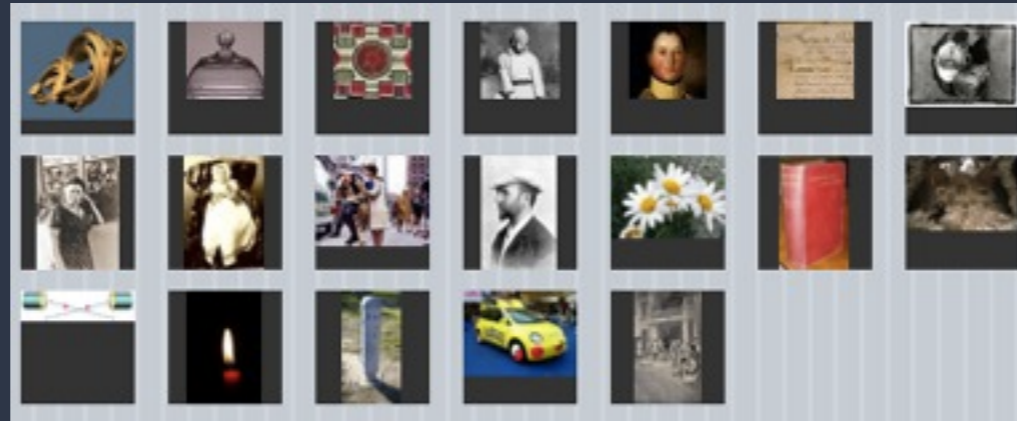
```
<a href="../../../mobile.html"
  class="fl-button fl-backButton">
  <span class="fl-button-inner">Back Button</span>
</a>
```

# FSS: Lists



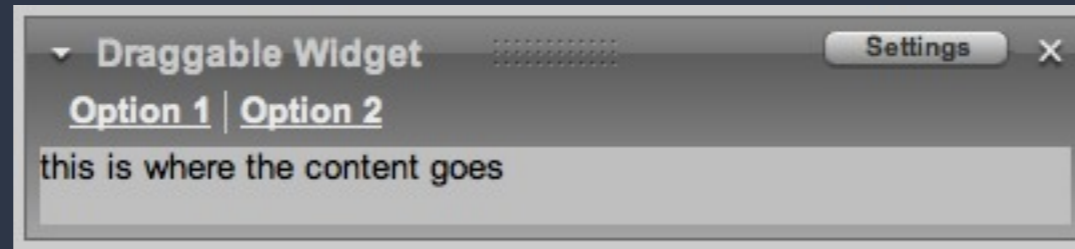
```
<ul class="fl-list-menu"> <li>
  <a href="#">Link Text</a>
</li> <li>
  <a href="#">Link Text</a>
</li> <li>
  <a href="#">Link Text</a>
</li>
</ul>
```

# mFSS: Image Grids



```
<ul class="fl-list-menu fl-list-thumbnails fl-grid"> <li> <a  
href="20.png">  </a> </li> <li> <a href="2.png">  
 </a> </  
li></ul>
```

# FSS: Widgets



```

        <div class="fl-widget">
<a class="fl-force-left fl-icon fl-icon-more" href="#">More</
a>
    <a class="fl-force-right fl-icon fl-icon-close" href="#">Close</
a>
    <a class="fl-button-right" href="#">
        <strong class="fl-button-inner">Settings</strong></
a>
    <h2>Regular Widget</h2>
    </div>
    <div class="fl-widget-options">
<ul>
    <li><a href="option1.html">Option 1</a></
li>
    <li><a href="option2.html">Option 2</a></li>
</ul>
    </div>
    <div class="fl-widget-content">
<p>this is where the content goes</p>
    </div></div>

```

# Other Stuff We Can Chat About



# Architecture and Accessibility





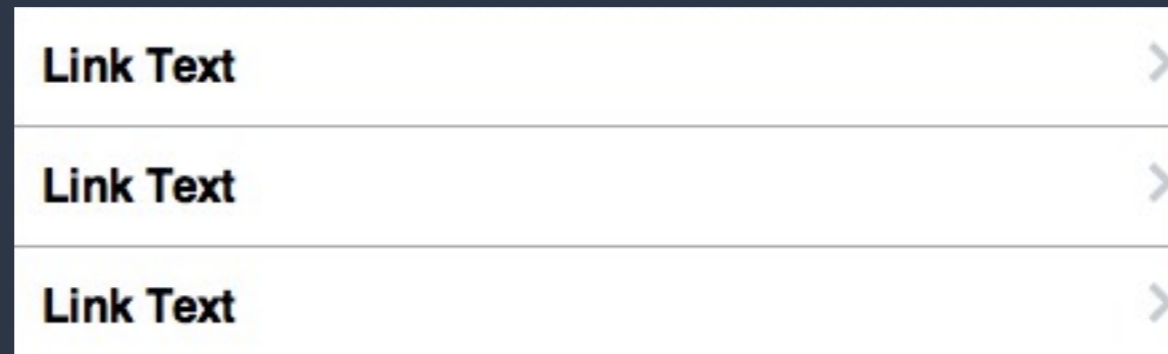
# The Web



# Architecture of the Web

- Separation of structure from presentation
- Declarative
- Stateless
- Interoperable

# Structure vs. Presentation



```
<ul class="fl-list-menu">
  <li>
    <a href="#">Link Text</a>
  </li>
  <li>
    <a href="#">Link Text</a>
  </li>
  <li>
    <a href="#">Link Text</a>
  </li>
</ul>
```

```
.fl-list-menu li {
  padding:0;
}
.fl-list-menu li a {
  display:block;
  padding: 12px 0px 12px
12px;
  text-decoration: none;
  font-weight: bold;
  outline: none;
}
```

# Declarative Programming

Declarative programming is a programming paradigm that expresses the **logic** of a computation without describing its **control flow**



# Declarative Programming

what

*not*

how

# Compare & Contrast

**Fluid Decapod**

Import Folder of Images | Finish Book and Export | Help

3-4	
5-6	
7-8	

### CONCERNING BEARDS

The priests of the Greek Church have been bearded for upwards of a thousand years. Bessarion came into Italy with the Archbishop of Russia in an effort to bring about a union between the Greek and Latin Churches. He found it easy to subscribe to the orthodoxy of the Latin Church, which got him his cardinal's hat. Bessarion was one of the stoutest men of his time, and his long beard and that of his companion so won the admiration of the Court of Rome that everyone longed to look like this distinguished man, were it only in the growth on his chin, and this fine Greek beard soon produced a number of Latin imitations. But Bessarion's beard was not so well received in France. The great man being sent thither as a legate, visited through policy the Duke of Burgundy before he saw King Louis XI. This was a bad blunder. Louis was furious at the preference given his rival. At the first audience granted Bessarion, Louis seized him roughly by the beard and abused him shamefully. One can imagine how this must have delighted Louis'

**Take picture**

Finish Book and Export

# Compare & Contrast

The screenshot displays the Fluid Decapod application interface. At the top left, the title "Fluid Decapod" is visible. To the right of the title, there are navigation links: "Import Folder of Images | Finish Book and Export | Help". The main content area shows a document page titled "CONCERNING BEARDS". The text on the page reads: "The priests of the Greek Church have been bearded for upwards of a thousand years. Bessarion came into Italy with the Archbishop of Russia in an effort to bring about a union between the Greek and Latin Churches. He found it easy to subscribe to the orthodoxy of the Latin Church, which got him his cardinal's hat. Bessarion was one of the stoutest men of his time, and his long beard and that of his companion so won the admiration of the Court of Rome that everyone longed to look like this distinguished man, were it only in the growth on his chin, and this fine Greek beard soon produced a number of Latin imitations. But Bessarion's beard was not so well received in France. The great man being sent thither as a legate, visited through policy the Duke of Burgundy before he saw King Louis XI. This was a bad blunder. Louis was furious at the preference given his rival. At the first audience granted Bessarion, Louis seized him roughly by the beard and abused him shamefully. One can imagine how this must have delighted Louis'".

On the left side of the document viewer, there is a vertical scroller overlay. It contains three thumbnail images of document pages. The second thumbnail is labeled "3-4" and the third is labeled "7-8". The word "Scroller" is written in white text across the middle of this overlay.

At the bottom of the application, there are two buttons: a green button with a camera icon labeled "Take picture" and a grey button labeled "Finish Book and Export".

# Imperative

```
if (!highlighted) {
    ctx.globalAlpha = 0.3;
} else {
    // Draw the scroll track rectangle.
    var clientLength = this._getClientLength();
    ctx.fillStyle = theme.scrollTrackFillStyle;
    ctx.fillRect(NIB_PADDING + 0.5, 0.5,
        clientLength - 2*NIB_PADDING, thickness - 1);
    ctx.strokeStyle = theme.scrollTrackStrokeStyle;
    ctx.strokeRect(NIB_PADDING + 0.5, 0.5,
        clientLength - 2*NIB_PADDING, thickness - 1);
}

var buildHandlePath = function() {
    ctx.beginPath();
    ctx.arc(handleDistance + halfThickness + 0.5, // x
        halfThickness, // y
        halfThickness - 0.5, Math.PI / 2, 3 * Math.PI / 2, false);
    ctx.arc(handleDistance + handleLength - halfThickness - 0.5, // x
        halfThickness, // y
        halfThickness - 0.5, 3 * Math.PI / 2, Math.PI / 2, false);
    ctx.lineTo(handleDistance + halfThickness + 0.5, thickness - 0.5);
    ctx.closePath();
};
buildHandlePath();

// Paint the interior of the handle path.
var gradient = ctx.createLinearGradient(handleDistance, 0,
    handleDistance, thickness);
gradient.addColorStop(0,
    theme.scrollBarFillGradientTopStart.replace(/%a/, alpha));
gradient.addColorStop(0.4,
    theme.scrollBarFillGradientTopStop.replace(/%a/, alpha));
gradient.addColorStop(0.41,
    theme.scrollBarFillStyle.replace(/%a/, alpha));
gradient.addColorStop(0.8,
    theme.scrollBarFillGradientBottomStart.replace(/%a/, alpha));
gradient.addColorStop(1,
    theme.scrollBarFillGradientBottomStop.replace(/%a/, alpha));
ctx.fillStyle = gradient;
ctx.fill();
```





# Declarative

```
<form class="fl-thumbnailContainer">  
  ...  
</form>
```

```
.fl-thumbnailContainer {  
  position: absolute;  
  top: 0pt;  
  left: 0pt;  
  bottom: 0pt;  
  overflow: auto;  
  width: 185px;  
  z-index: 100;  
}
```



# Statelessness

“The Web is broken. It can’t remember me between requests”



# Statelessness

- The Web is stateless for a reason: *it scales*
- State is visible, not encapsulated

[http://build.fluidproject.org:8095/engage/artifacts/view.html?  
accessNumber=M2000.38.97&db=mccord&lang=en](http://build.fluidproject.org:8095/engage/artifacts/view.html?accessNumber=M2000.38.97&db=mccord&lang=en)



# Interoperable

- Web formats are:
  - Plain text
  - Declarative
  - Openly published and standardized
- This means they are adaptable and extensible