



Designing software  
that works – for everyone

# **The Fluid Project: An Open Community for Inclusive Design**

**Colin Clark**, Fluid Project Technical Lead, Adaptive Technology Resource Centre, University of Toronto

# Topics We'll Cover

- " Project vision and goals
- " The Fluid community
- " Improving the user experience
- " Technology framework
- " Road map
- " How to get involved



Designing software  
that works - for everyone

# Project Vision and Goals



# Vision

- " Advance the status of UI development and design in academic community source projects
- " ...so that they can fulfill their potential as platforms for innovation
- " Create a community of UX expertise
- " Build a presentation layer across applications that can support the diversity of needs within higher education
- " Support the precarious values of usability and accessibility

# The Context for Fluid



- " Issues of usability & accessibility are significant for community and open source software
- " A great user experience is the next step for wide open source success and adoption
- " Our goal is to incrementally improve the overall user experience of uPortal, Sakai, Kuali Student, Moodle, and other projects



# Fluid's Approach



- " Cross-project collaboration:
  - Share scarce UX resources across projects
  - Solve common challenges
  - Recognize recurring user interface idioms
- " A holistic approach: combine technology & design
- " A two-fold path:
  - **Social:** build a community around UX
  - **Technical:** new UI development tools

# Accessibility Vision

- " Disability is an artifact of the environment:
  - A mismatch between user and the system
- " Embrace diversity:
  - Users all have different needs
  - Under different circumstances
- " One size never fits all
- " Build systems that can bend and adapt to meet the users' individual needs



Designing software  
that works - for everyone

# The Fluid Community





# Participating Projects

## " uPortal

- Enterprise portal system
- Aggregates personalized student information

## " Sakai

- Collaboration and learning environment
- Teaching, research, and group collaboration

## " Moodle

- Learning management system
- Strong focus on pedagogy

## " Quali Student

- Upcoming, next generation student system
- Viable alternative to high-cost commercial products

# Fluid Beyond Higher Ed



- " Fluid is looking at challenges faced by all open source projects:
  - 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?
- " Our work on DHTML accessibility and personalization will drive open standards
- " We'd like to collaborate with and learn from you!



# Who is Involved?



- " Partnership among several universities and corporations
- " Toronto, UBC, UC Berkeley, York, Cambridge, Michigan State, and others
- " IBM, Sun, and Mozilla Foundation
- " Broad range of experience

# Interaction Design

- " Start with heuristic and usability reviews
- " Baseline for usability and accessibility
  - Know where we need to improve
  - Prioritize the pain points
- " User research: what are our users' goals?
- " UX Toolkit: shared design resources for usability and accessibility
- " Design new solutions

# What are we going to build?

- " Rich, flexible DHTML user interface components
  - Reusable components: work across applications
  - More than just widgets
  - Easy to wire up and customize
- " New JavaScript development framework
  - Technical infrastructure for pluggable components
  - JavaScript libraries for DHTML accessibility
  - Builds on existing toolkits
- " Open accessibility standards
- " Integration with open source projects



Designing software  
that works - for everyone

# User Experience & the UX Toolkit



# UX Toolkit

- " All the stuff you need to design great interfaces
- " User interface components
- " UI Design Patterns
  - Good advice when designing UIs
  - Take material from Tidwell, Yahoo!, and other patterns
- " UX Walkthroughs & Distributed User Testing
  - Driven by the communities, but collaborative
  - Reusable protocol and checklist
  - VULab
- " User Persona Library
  - Leverage the design patterns library

# Components

- " Components are recurring interactions:
  - Navigation: wizards, sequences, workflows
  - Content: file management, uploading, attachments
  - Direct manipulation of objects
- " Choosing components will be based on:
  - Analysis of existing applications across projects
  - Recognizing common UI idioms in other applications
  - Solving the most frequent and severe problems



# UX Walkthroughs: Goals

- " Assess what we've got: identify user pain points
- " Identify “componentizable” solutions
- " Drive our development priorities
- " Provide baseline for future evaluation
- " Create shared protocol & process for usability and accessibility
  - ...that fits smoothly into ongoing development processes

# Challenges/Opportunities

- " Checking an application for
  - usability
  - access for a screen reader user, screen magnifier user
  - access for someone who can't use a mousecould require different evaluators, multiple passes... is this essential?
- " Can we bring *accessibility* walkthroughs to the level of maturity of *usability* walkthroughs?
- " Can we adapt walkthroughs to components rather than applications?
- " Can we combine “walkthroughs” and “heuristic evaluations”?

# How We Do Walkthroughs

- " Working group
  - 3 to 5 evaluators on each project
  - Usability and accessibility focus
- " Define process and priorities:
  - Iterative
  - user profiles
  - scenarios of use for cognitive walkthroughs
- " Perform individual evaluations
- " Synthesize evaluations and prioritize
- " Brainstorm design solutions
- " Collaborate with participating communities

# U-Camps



- " Our main educational effort:
  - Everyone should have a basic UX vocabulary
  - Share a repertoire of viable UX techniques
  - Opportunity for designers and developers to collaborate
  - Loose agenda, open participation
- " Two successful U-Camps so far, two more planned:
  - November 12 at Rutgers University
  - December 3 in Newport Beach, California



Designing software  
that works - for everyone

# Technology



# Technical Goals

- " Make it easier for developers to build better, more accessible user interfaces
- " Support collaboration with designers
- " Make it easier to share designs within a community
- " Enable components to be adapted for a variety of tools and workflows
- " Embrace the Web

# Architecture Summary

- " Unique challenge: how to enable support for very diverse presentation technologies?
- " Based on JavaScript, DHTML, and AJAX
- " Thin binding layer between client and RESTful, largely stateless server
- " Loose coupling, works across applications
- " In translation:
  - Web 2.0 made more usable & accessible

# What is a Reusable Component?

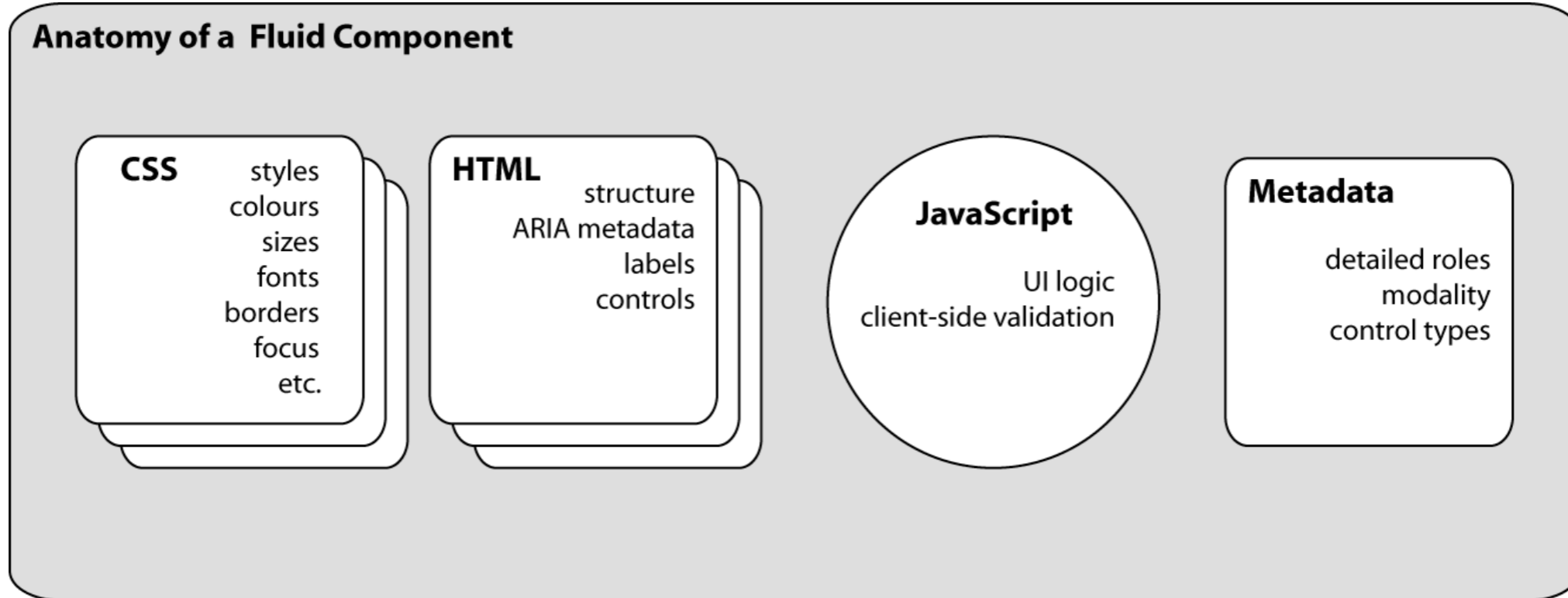
- " On the client-side, a Fluid component consists of:
  - One or more HTML templates
  - One or more layers of CSS
  - JavaScript for behavioural logic
  - Accessibility metadata (control, presentation, etc)
- " And on the server-side:
  - Binding conventions: markup, RESTful server callbacks
  - The ability to deliver the appropriate markup, metadata, and user preferences



# Anatomy of a Component



Designing software  
that works - for everyone



# Fluid Accessibility

- " Web 2.0 *will* be accessible
  - it's just a matter of time
- " ARIA: Accessible Rich Internet Applications (W3C)
- " AccessForAll for component metadata
- " Ongoing toolkit accessibility support
  - Dojo and others
- " Design specific alternatives
- " Fluid: Accessibility from the ground up

# Flexibility & Customization



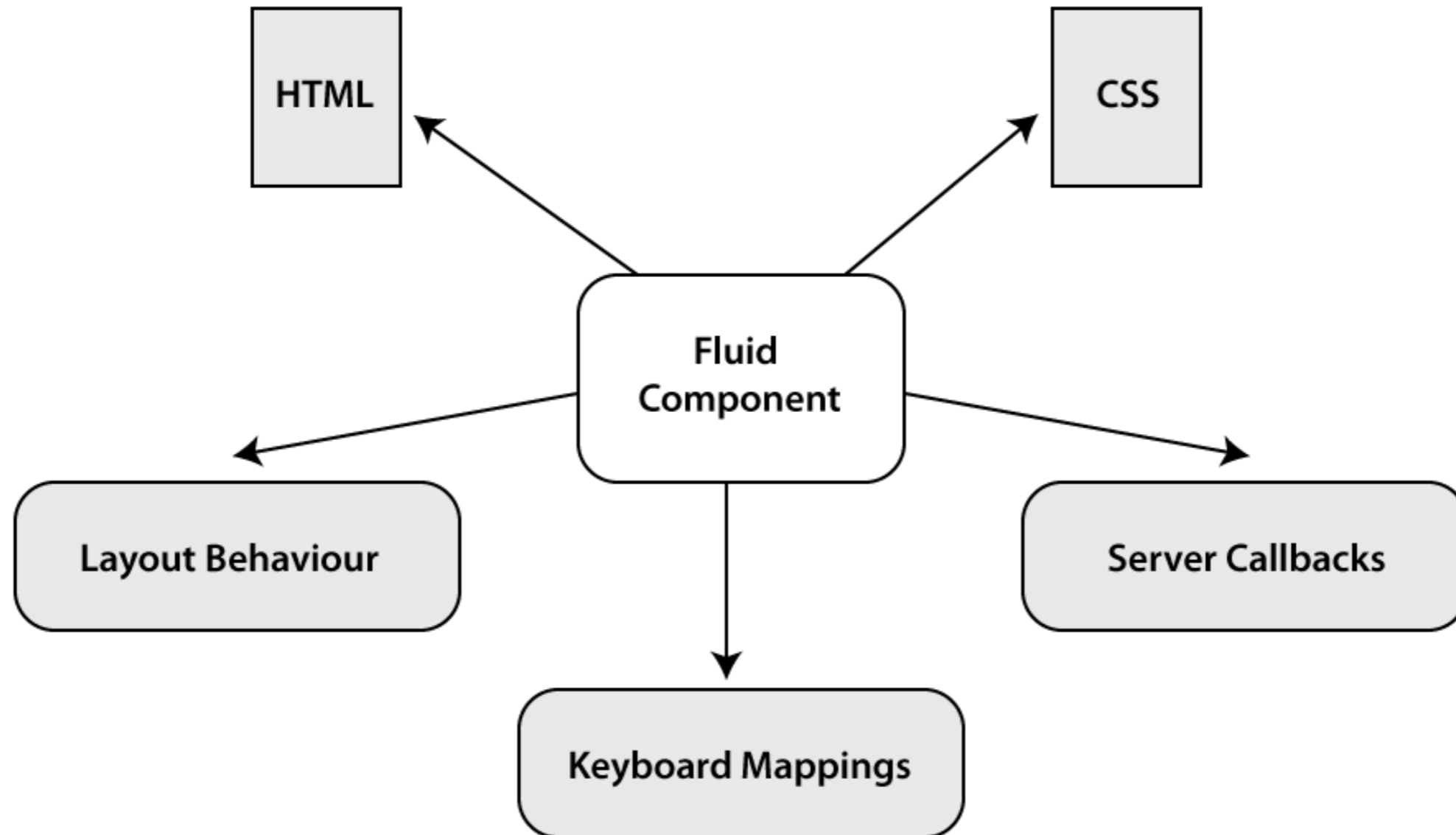
- " Fluid will be a highly flexible UI layer
- " Differing needs of individuals and institutions
- " At configuration-time:
  - Branding, appearance, and styling
  - Choose the functionality and experience available
- " At run-time:
  - Swap in accessible controls
  - Provide high contrast, large print, etc.
  - Components designed for different user needs



# Composition = Flexibility

- " Fluid components are built out of smaller units
  - Keyboard handlers
  - Layout managers
  - Server callbacks
- " Composition enables flexibility
  - At runtime, wire up alternative behaviour
  - Use web standards to change presentation (HTML/CSS)
- " Easy to extend or modify component behaviour

# Component Composition



# The Fluid Framework



- " Common accessibility APIs:
  - Focus management
  - Keyboard handlers
  - Getting/setting ARIA properties
- " Framework infrastructure:
  - Dependency injection
  - Server-side communication
  - Portal-friendly DOM conventions
- " Adaptation:
  - The ability to wire up component behaviour at runtime

# The Lightbox & Reorderer

- " Component design strategy:
  - Start with solving a real problem
  - Extract reusable code in libraries
- " Our first UI component: The Lightbox
- " Sakai's Image Gallery:
  - No way to sort images in albums
  - Opportunity to explore direct manipulation on the Web
  - Hard, interesting accessibility challenges
- " Built this code up into fully accessible sorting library



# The Lightbox

My Workspace

[Home](#)

[Profile](#)

[Membership](#)

[Schedule](#)

[Resources](#)

[Announcements](#)

[Worksite Setup](#)

[Preferences](#)

[Account](#)

[Evaluation System](#)

[Evaluations](#)

[Site Info](#)

Gallery

[Help](#)

Gallery

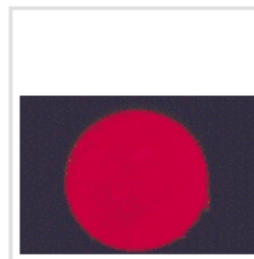
Gallery Collections

Test

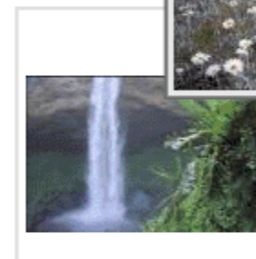
## Test Collection

Sort by: Instructor Defined

[View Slide Show](#)



[Image Title](#)



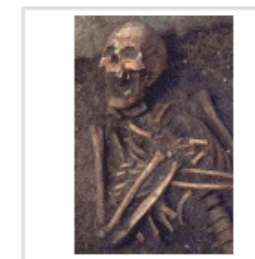
[Image Title](#)



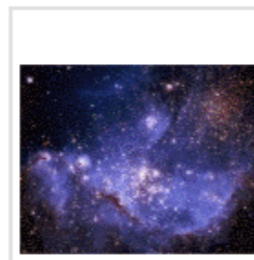
[Image Title](#)



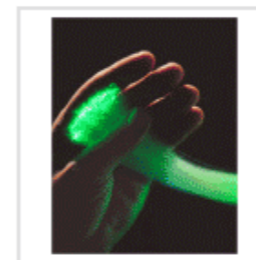
[Image Title](#)



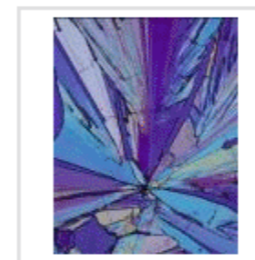
[Image Title](#)



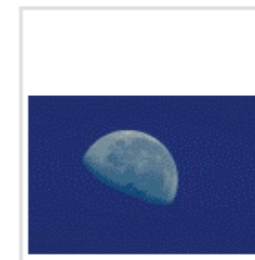
[Image Title](#)



[Image Title](#)



[Image Title](#)



[Image Title](#)



[Image Title](#)



# Drag & Drop Accessibility

- " Start from scratch: focus on the goal, not the task
  - Reordering images
  - Doesn't necessarily look like drag and drop
  - What alternatives are available on the desktop?
  - Cut and paste-style interactions
  - Shifting images like on a real light table
- " What does accessibility mean here?
  - Keyboard access
  - Support for magnification and linearization



Designing software  
that works - for everyone

# Lightbox Demo





Designing software  
that works - for everyone

# Project Road Map



# Road map

- " Ongoing UX Walkthroughs & user testing
  - Refine protocol and checklist, share with other projects
- " Lots of user research and design
  - Navigation schemes in complex multi-tool apps
  - File and content management
- " New component development
  - File uploader, browser, picker
  - Tab-based navigation, menus, portlet navigation
- " Work on open accessibility standards
  - User preferences, UI metadata

# In Summary



" For more information, visit the Fluid Project web site:

[www.fluidproject.org](http://www.fluidproject.org)

" Goals:

- Better, more inclusive web development tools
- Foster a vibrant open UX community

" Join our community, everyone is welcome!

