



**Methods for developing with Sakai,
serverside and datafeeds with fearless
javascript**

AuSakai 2008

Introduction

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Backend developer
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Frontend developer

The Plan

- Introduction
- Architecture
- Demos and examples
- Hands on: Back end
- Hands on: Front end

Introduction

- Who are you ?
- Sakai Development
- Drivers for Change

Sakai App Development

- Developer Driven
- Barriers to UI Developers

Stakeholder

Designer

UI Dev



Java
Developer
Team

Rise of Client Side

- Web2.0, User focused, rapid development, GWT, GMail, Rich Client Apps, OpenSocial, 1000s of UI developers.
- Rapid Cycles

More balanced team

Stakeholder

Stakeholder

Go

Team

UX Designer

Interaction Designer

UI Developer

Java Developer

Scalability

- Light Server Load, mainly static content, lower bandwidth
- 1-4 CPU cores per user as opposed to 100's per server CPU
- Green & Cool ?

Efficient Development Model

- ❑ Server side is so slow to work with, weeks per app.
- ❑ Client side, fast cycles, days per app.

How development should happen



Java Developer Route



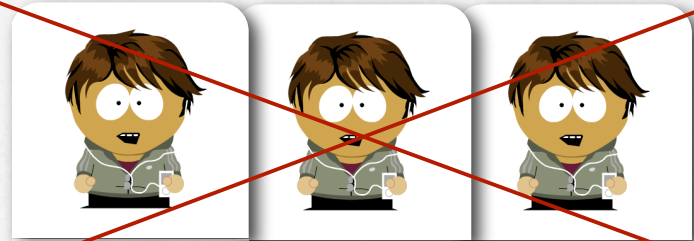
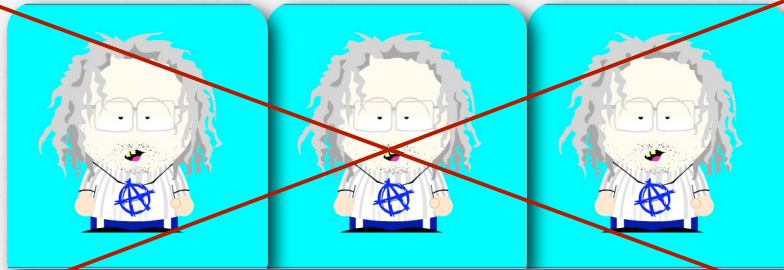
- Best-case: gather requirements
- Interpret requirements
- Long development process / Worst case: restart
- Quick testing interface
- Delivers final product
- Final: Lucky: perfect <--> Normally: out of range

UI Developer Route

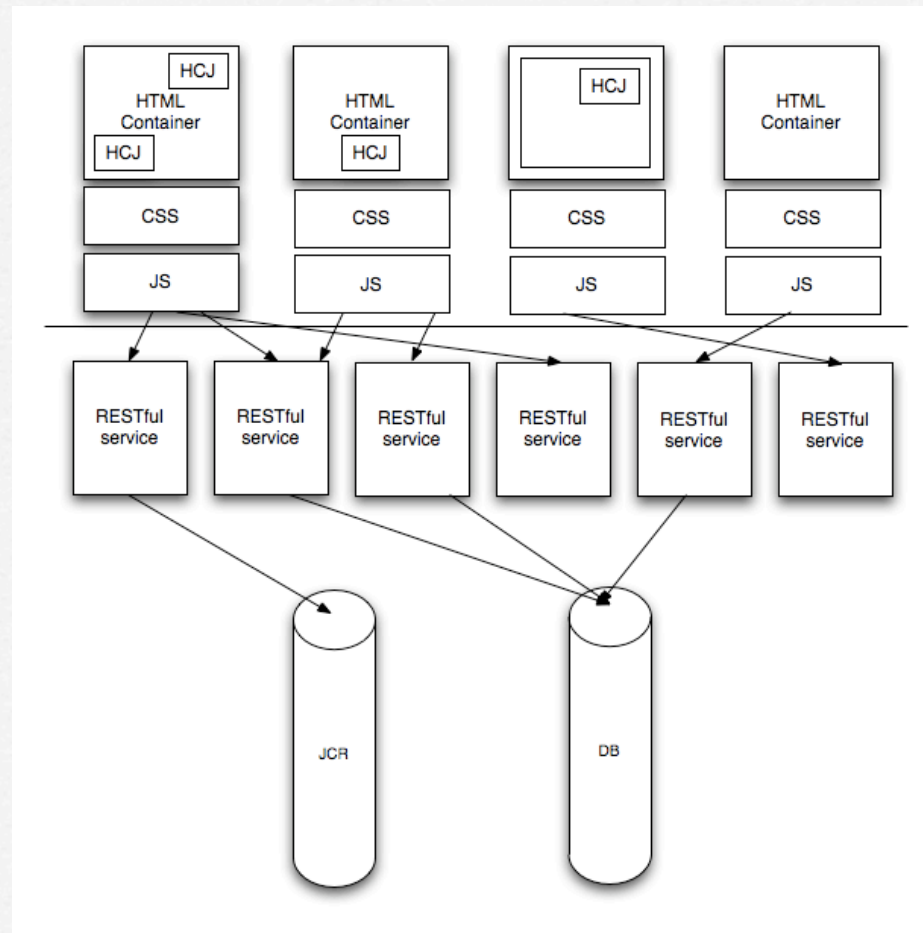


- Gather requirements, build use-cases, ...
- Interaction designs + wireframes
- Take to stakeholder and real users
- Adjust according to user feedback
- Repeat 3 and 4
- Translate: Data requirements => Java Developer
- Java Developer: can work data-oriented only and much more result focussed
- UI Developer develops wireframes and brings in functionality
- User feedback and adjustments during 8
- Final product: looks good, is functional, feels natural and represents what the user wants

Team



Architecture



Back-end

- RESTful services
- Feed JSON data
- Work over the wire
- Follow the HTTP spec

JSON

JSON (pronounced "Jason"), short for JavaScript Object Notation, is a lightweight computer data interchange format. It is a text-based, human-readable format for representing simple data structures and associative arrays (called objects).

The JSON format is specified in RFC 4627 by Douglas Crockford. The official Internet media type for JSON is application/json. The JSON file extension is .json.

The JSON format is often used for transmitting structured data over a network connection in a process called serialization. Its main application is in Ajax web application programming, where it serves as an alternative to the use of the XML format.

Although JSON was based on a subset of the JavaScript programming language (specifically, Standard ECMA-262 3rd Edition—December 1999) and is commonly used with that language, it is considered to be a language-independent data format. Code for parsing and generating JSON data is readily available for a large variety of programming languages.

In December 2005, Yahoo! began offering some of its web services optionally in JSON. Google started offering JSON feeds for its GData web protocol in December 2006.

JSON

- ❑ Associative array
- ❑ Easy to read, easy to process
- ❑ Small
- ❑ Evaluates straight into JavaScript object
- ❑ Nice library support

JSON

```
{"items":[{"motdBody":"Welcome to the Sakai conference in  
Paris","motdUrl":"http://localhost:8080/access/  
announcement/msg/!site/motd/4d023855-f537-42dd-  
afa1-7e11521d1279","motdTitle":"MOTD"}]}
```

JSON

```
{  
  "items": [  
    {  
      "body": "Welcome to the Sakai conference in Paris",  
      "url": "http://localhost:8080/access/announcement/msg/!site/motd/4d023855-f537-42dd-afa1-7e11521d1279",  
      "title": "MOTD"  
    }  
  ]  
}
```

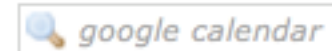
Front end

- *skeleton* = set of plain HTML pages +
CSS

Widgets

- Place inside skeleton
- Reusability
- Multiple instances
- Modular

Widget Examples



My Files

- My Calendar
- My Account
- My Settings
- Display Options
- Customise

Normal view | **Tag view**

Create Folder | Upload Files | Set permissions | Remove | Edit Details | WebDAV

Current location: Personal Tools

- testfolder
- 1_.png
- Applications.zip
- felicities Imagine Cup.pdf

My Courses and Projects

My Favourites

- Administration Workspace
- CamTools Best Practice
- Camtools Framework
- CARET
- JISC Academic Networking

My Other Courses and Projects

- Personal Tools
- 3A1 FM1 Eng : IIA 06_07
- Demo site - making further use of CamTools
- Fie's Test Site 3
- Fie's test Site 4
- Fie's test site1
- MBA NotForProfit SIG
- N+N survey test
- Robs Test Site
- Using a Virtual Learning Environment
- Zero-Carbon

Find and join courses & projects in the [Courses & Project](#) page

CamTools Information

Welcome to CamTools

Did you know you can change your CamTools Startpage to include the information and tools that you want?

Go to your Startpage by clicking on 'My Startpage' in the top right-hand menu, and then click the 'customise' link beside the title. You'll see a choice of widgets that you can add to the page, as well as a choice of page layouts. Interested? Why not watch the [video tutorial here](#).

Note that CamTools is designed to work best with Internet Explorer 6 or 7, or Firefox 2 or 3. If you're using an older web browser, you will probably see a blank page when you log in. [Find out more](#).

Announcements & Updates

- The file **Ostrakon-Swift Accounts - returned.xls** has been added/updated in **Camtools Framework** (17 Nov 08 12:06)
- The file **shahnama.png** has been added/updated in **CARET** (12 Nov 08 11:10)
- The file **camtools poster.png** has been added/updated in **CARET** (12 Nov 08 11:10)
- The file **freezeframe.png** has been added/updated in **CARET** (12 Nov 08 11:10)
- The file **molstruc.png** has been added/updated in **CARET** (12 Nov 08 11:10)

My News Feeds

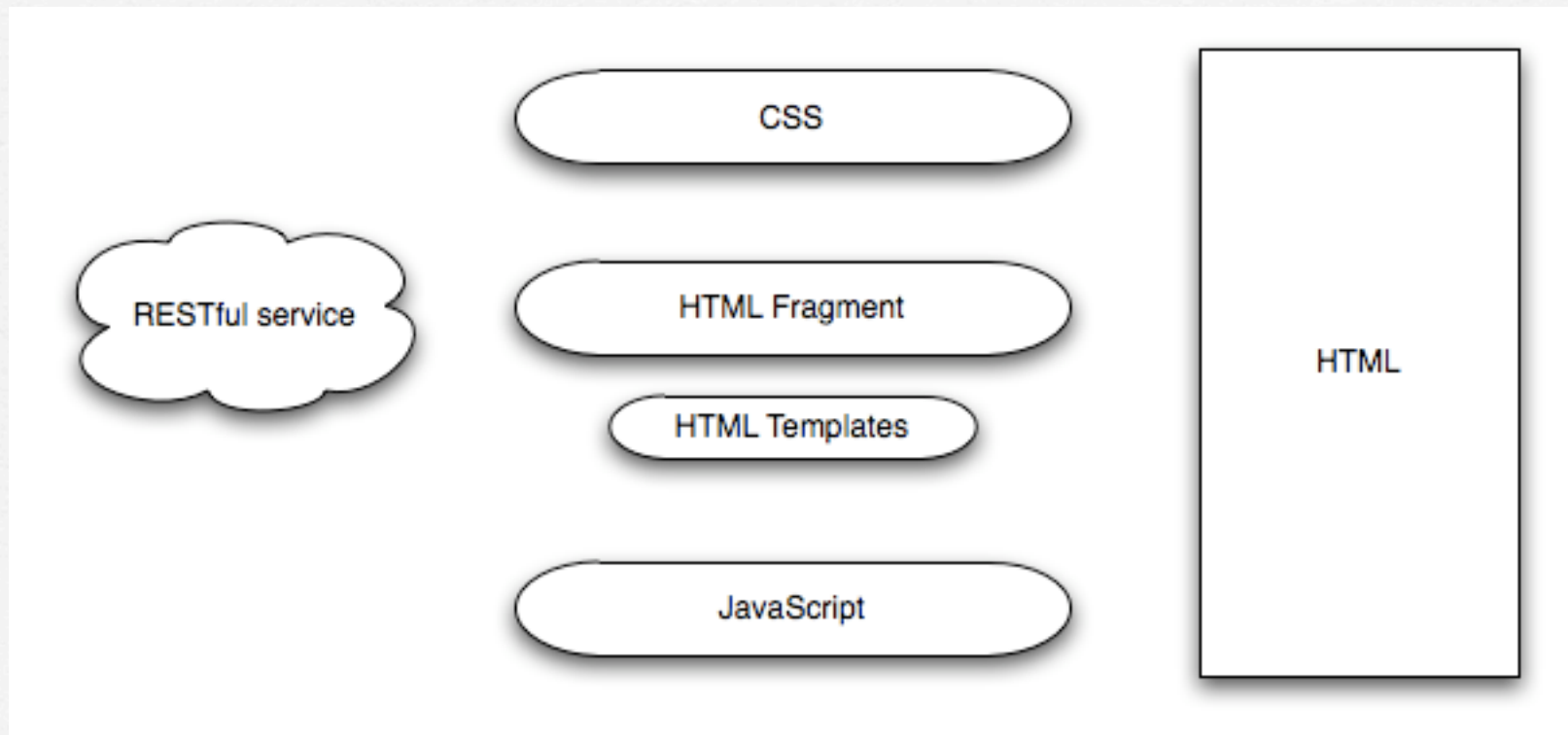
1 2 3 >

- Cambridge issue 2009 Boat Race challenge
(Cambridge University - 25-11-2008 15:11:00)
- Cambridge University Boat Club President Henry Pelly issued the official Challenge, to race on The Thames in just 19 weeks' time, to his Oxford counterpart Colin Smith at a reception at the Portland Gallery in London and it was promptly accepted.
- Are you a real entrepreneur?
(Cambridge University - 25-11-2008 14:37:00)
- Murray Edwards to mull on Clare Short's view of the Middle-East
(Cambridge University - 24-11-2008 12:22:00)
- Tata Steel Group endows professorship in metallurgy
(Cambridge University - 24-11-2008 10:52:00)
- One year on, ClimateWise is driving change in the insurance sector
(Cambridge University - 24-11-2008 08:00:00)

1 2 3 >

Add and remove news feeds

Widget Architecture



Widgets specials

- static files on disk
- SVN checkout into tomcat / webapps
- Load, change, save, refresh

Widgets Specials

- Replacement for a tool
- No more iFrames !

JavaScript

□ Key player

No !!!!!!!



JavaScript

- Why have we avoided JavaScript
- Why libraries?
- Cross browser issues
- Browser Support

JavaScript

- => FEARLESS JAVASCRIPT
- Not hard any more
- Toolkits
- Documentation
- Future
- Speed

JavaScript


- Build and fills the screen
- Requests and receives
- Consumes JSON
- Allows very advanced interaction

JavaScript

My Profile

Show settings

Edit Profile | View Profile



Nicolaas Matthijs
Status: Online

is working on Social Networking

1 Connection Request

Sites

Show settings




Join a Site | Edit Site List | Create a Site

- Portfolio's
- Uncategorized
 - Nicolaas Matthijs

My Friends

Show settings

Find Connections | Edit Connections List

-  **John Normandy** (Offline)
-  **Peter Knoop** (Offline)
is less frustrated with the upload new picture capability ;)
-  **Anne-Sophie De Baets** (Offline)

See my other connections

Status:	<i>Nicolaas is working on Social Networking</i>
First Name:	Nicolaas
Last Name:	Matthijs
Gender:	Male
Date of birth:	1/July/1986

JavaScript in Future

iPhone, iTouch, ... support

Development

<http://webkit.org/blog/189/announcing-squirrelfish/>

<http://code.google.com/p/v8/>

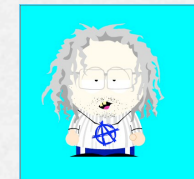
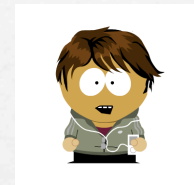
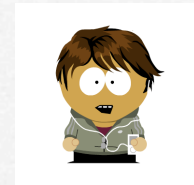
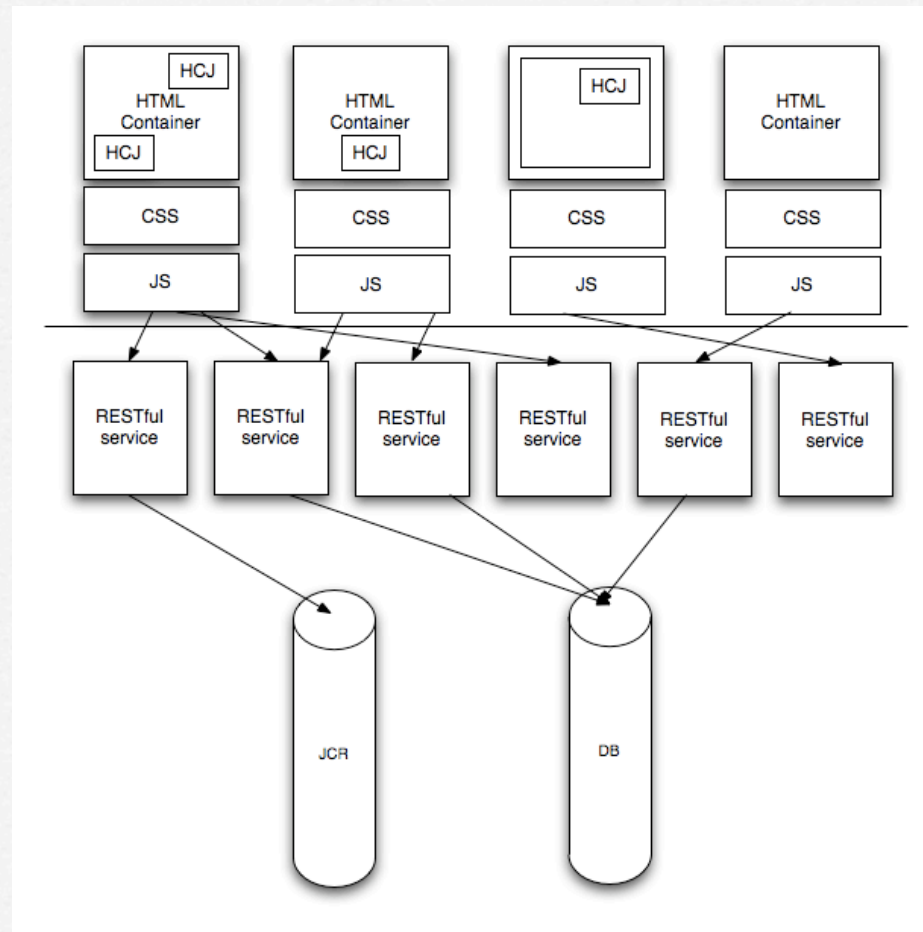
Accessibility support

JavaScript for me



- Learning is possible
- Trying is the best way
- Yes, we can help you

Architecture - Team



Theory is good
Evidence is better

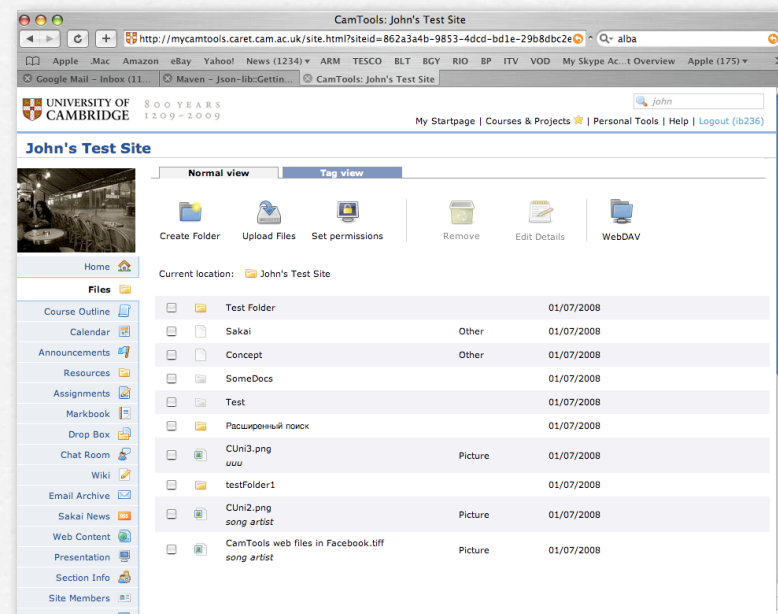
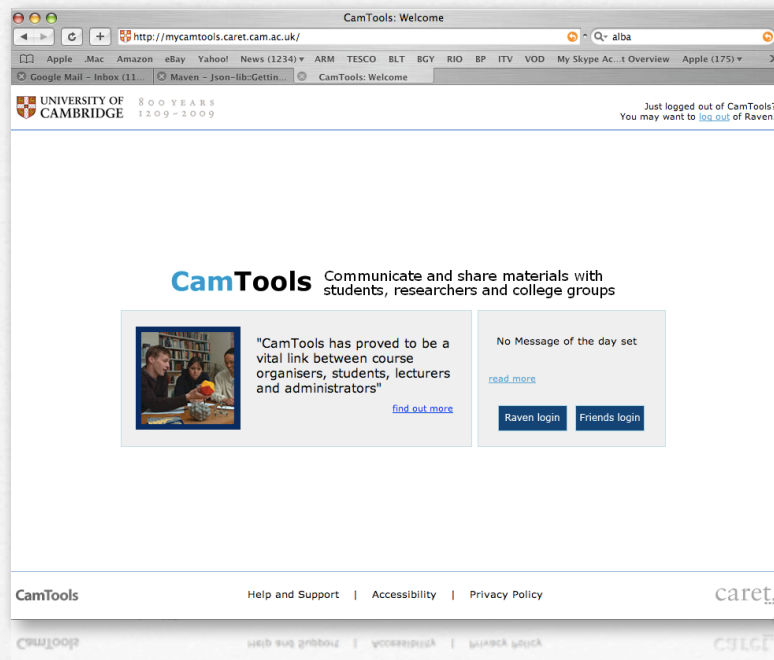
MyCamTools

- Developed using this theory
- Full HTML - CSS - JavaScript front end
- Only static files
- Much progress
- In production since July

MyCamTools Goals

- Make our local Sakai more user friendly
- Lower development bar
- Speed up development
- Better seperation

Demo



<http://camtools.cam.ac.uk>

<http://camtools-labs.caret.cam.ac.uk>

Installing MyCamTools

- sakai 2.5 or sakai 2.6 installation
- Install and deploy Search
- `search.enable=true` (sakai.properties)
- Install and deploy JCR
- `jcr.experimental=true` (sakai.properties)

Installing MyCamTools

- Download and deploy SData
<https://source.caret.cam.ac.uk/camtools/trunk/camtools/sdata>
- Go to TomCat webapps dir
- `svn co https://source.caret.cam.ac.uk/camtools/trunk/camtools/flat/src/main/webapp ROOT`
- `svn co https://source.caret.cam.ac.uk/camtools/trunk/camtools/widgets/src/main/webapp widgets`

UX Improvement Initiative

□ Nathan Pearson (Sakai Foundation)

□ => Make Sakai look better

□ More info:

[http://bugs.sakaiproject.org/confluence/
display/UX/Improving+the+CLE+1](http://bugs.sakaiproject.org/confluence/display/UX/Improving+the+CLE+1)

UX Improvement Initiative

- Since August => implemented most screens
- but ...
- kept making same assumptions

...

Sakai 3

Sakai 3 ?

- Ultimate goal: more useful + more user-centered
- Recycling of UX initiative screens
- Break out tool silo's
- More flexible way of creating sites => context (cfr. Google Sites)

Sakai 3?

- Break down site as only organisational structure
- Central file repository => browsing, reusability, assessment, portfolio
- Creating ad-hoc non-site bound groups
- Social Networking

Timeline

- Now: design - prototype - implementation
- July 2008: Alpha release
- Production: Cambridge and GATech
- Help wanted !

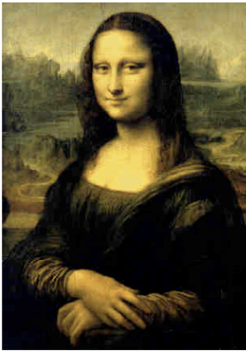
Demo

Sakai 3.0

Back to My Dashboard admin (Sign Out) | My Preferences | Help

Painters and Paintings

Welcome to Painters and Paintings !



Useful links:
[We can have dashboard pages](#)
[We can have a tool](#)
[Or a regular web page - Impressionism](#)
[Cubism](#)
[Expressionism](#)

Course introduction:
ART has not always been what we think it is today. An object regarded as Art today may not have been perceived as such when it was first made, nor was the person who made it necessarily regarded as an artist. Both the notion of "art" and the idea of the "artist" are relatively modern terms.

Many of the objects we identify as art today – Greek painted pottery, medieval manuscript illuminations, and so on – were made in times and places when people had no concept of "art" as we understand the term. These objects may have been appreciated in various ways and often admired, but not as "art" in the current sense.

ART lacks a satisfactory definition. It is easier to describe its creation of aesthetic objects, environments, or experiences than to define it.

The idea of an object being a "work of art" emerges, together with the idea of an artist.

During the Renaissance, the word Art emerges as a collective term for various activities, such as music and poetry, which became known in the 18th century as the "fine arts". The word "art" in the 18th century included Music and Poetry which became known in the 18th century from which have been generally excluded the "decorative" and "mechanical" arts, all of which have utility as an end.

But how did Art become distinguished from the decorative?

In the Ancient World and Middle Ages the word we would translate as 'art' today was applied to any activity governed by rules, such as shoemaking and weaving, which today we would call crafts.

Read more on Art & Artists in the Ancient World and Middle Ages...

During the Renaissance, there emerged a more exalted perception of art, and a concomitant rise in the social status of artists.

Welcome

- Dashboard Example
- Announcements
- Impressionism
- Cubism
- Expressionism
- test

Existing members, sign in here

on the UX Improvement you will see more experimental Social Networking, ...

Username:

Password:

My Dashboard

Sakai Administrator (Sign Out) | My Preferences | Help

Tools Show settings

Add Tools

- Home
- Users
- Aliases
- Sites
- Realms
- Worksite Setup
- MOTD
- Resources
- On-Line
- Memory
- Site Archive
- Job Scheduler
- Become User
- User Membership
- Polls

Sites Show settings

Join a Site | Edit Site List | Create a Site

- Portfolio's
 - Nicolaas Mathijs
 - Portfolio 1
 - Portfolio2
 - Portfolio
 - test15
 - test19
- Uncategorized
 - Sakai Administrator
 - Admin Test
 - Administration Workspace
 - Authoring
 - Belgian Gardening
 - CARET
 - Citations Admin
 - Famous monuments
 - Helpdesk Issues
 - Joe's New Site
 - John's Test Site
 - mercury site
 - Old Legacy Site
 - Painters and Paintings
 - PortfolioTemplate
 - Ray's Test
 - Roskilde University
 - testsite

My Profile Show settings

Edit Profile | View Profile



Sakai Administrator
Status: Online

is watching other people on Sakai

No Connection Requests

My ProfileMy PeopleMy InboxOnline connections

<http://sakai.sakaiproject.org>

Installing Sakai 3

- sakai 2.5 or sakai 2.6 installation (for now)
- Install and deploy Search
- `search.enable=true` (sakai.properties)
- Install and deploy JCR
- `jcr.experimental=true` (sakai.properties)

Installing Sakai 3

- Download and deploy SData
<https://source.sakaiproject.org/contrib/tfd/trunk/sdata>
- Go to TomCat webapps dir
- `svn co https://source.sakaiproject.org/contrib/ux/branches/3.0/uxportal/src/main/webapp dev`
- `svn co https://source.sakaiproject.org/contrib/ux/branches/3.0/uxwidgets/src/main/webapp devwidgets`

New !

□ Develop Sakai without running it

```
$ apt-get install libapache2-mod-proxy-html
```

```
$ a2enmod proxy
```

```
$ # probably does this automatically: a2enmod proxy_http
```

```
$ # probably done by apt-get automatically: a2enmod proxy_html
```

```
$ a2enmod ssl
```

```
$ vim sites-enabled/000-default
```

```
# Must do this otherwise ProxyPass doesn't know what to do with https  
SSLProxyEngine on
```

```
# Punch a hole through the proxying
```

```
ProxyPass /dev !
```

```
ProxyPass /devwidgets !
```

```
# Everything else goes through some running Sakai instance
ProxyPass / http://somerunninginstance
ProxyPassReverse / http://somerunninginstance
```

```
# Map the "hole" through to the filesystem
Alias /widgets.js "/home/raymond/ctlwidgets/htdocs/ROOT/widgets.js"
Alias /widgets/ "/home/raymond/ctlwidgets/htdocs/widgets/"
```

```
$ vim mods-enabled/proxy.conf
```

```
Add "Allow from all" (Debian defaults to paranoia)
```

```
$ /etc/init.d/apache2 restart
```

A spiral-bound notebook with a white page and a black spiral binding at the top. The text "Hands-on: Frontend" is centered on the page.

Hands-on: Frontend

A spiral-bound notebook with a white page. The spiral binding is at the top. The text "JavaScript 101" is centered on the page.

JavaScript 101

Firebug (Firefox)

- Debugger
- Profiling tool
- DOM Inspector
- Interactive console

=> Your new best friend

Development Environment



- Aptana Studio
- JavaScript oriented version of Eclipse
- IntelliJense
- jQuery support

Definitions

- DHTML = Dynamic HTML
- AJAX = Asynchronous JavaScript and XML
- RIA = Rich Internet Applications

But why bother at all ?

- Improved user experience
- Improved performance
- Expectations

Flash / SilverLight ?

- Political: Open vs Closed
- Practical: Open vs Closed
- Accessibility

DHTML/AJAX

- Open standards
- Works within the browser
- Accessibility

Part I: The Basics

- variables
- null vs undefined
- type coercion
- objects and arrays

Defining variables

- Define types with var
- No need to declare types

```
var mango = "yum";  
mango = 12345;
```

Global variables

- If you ommit var --> global variable

```
rottenTomate = "gross" // This is global
```


Null vs Undefined

- null is the "nothing" value
- undefined is extremely nothing

Default value for defined variables

Error when JavaScript sees unknown variable

Null vs Undefined

```
var foo;
```

```
foo === undefined
```

```
console.debug(anothervariable); //undefined
```

Truthy and Falsey

- JavaScript does a lot of automatic type coercion
- Shades of true and false
- use careful - be aware
- useful when evaluating arguments

Falsy values

- `false`
- `null`
- `undefined`
- `""`
- `0` (zero)
- `NaN`

- Everything else is truthy
-1, "false", "0" are all true

Equal vs Equivalent

□ Comparisons are coercive

`1 == "1" // true`

`0 == false // true`

□ Non-coercive comparisons

`1 === "1" // false`

`0 === false // false`

Using Truthy and Falsey

- checking for valid arguments before operating on them
- substituting defaults
- Be careful with arguments that genuinely might be false, like numbers

```
if (apples) {  
    apples.eat();  
}
```

A spiral-bound notebook with a white page. The spiral binding is at the top. The word "Objects" is written in the center of the page.

Objects

Object are loose containers

- At their core : maps
- `new Object()` or `{}` returns empty container of key/value pairs
- Keys can be any string, values can be everything
- Two different ways to access members

`basketOfFruit.apples` // dot notation

`basketOfFruit["bananas"]` // subscript notation

- You can add new members to any object at any time

Object are modifiable

```
var basketOfFruit = {};
```

```
// New property
```

```
basketOfFruit.apples = "macintosh";
```

```
// New method
```

```
basketOfFruit.eat = function () {
```

```
  return "tasty";
```

```
}
```

No Classes

- JavaScript doesn't have any concept of classes
- Methods are just properties in a container:
 - pass them around
 - modify them
 - delete them

First class functions

- ❑ Functions are data
- ❑ You can assign them
- ❑ You can pass them as arguments
- ❑ You can return them as results

Defining and using functions

```
var puree = function (aFruit) {  
  return puree(aFruit);  
};
```

```
function squeeze(aFruit) {  
  return squeeze(aFruit);  
}
```

```
function popsicle(juiceMakerFn, fruit) {  
  var juice = juiceMakerFn(fruit);  
  freeze(juice);  
}
```

What does this mean

- ❑ You can pass bits of logic around and
- ❑ have them be invoked later
- ❑ Callbacks are easy to write and ubiquitous
- ❑ Functions are our basic building block

Don't extend built in types

- ❑ Dynamic objects are awesome. But dangerous.
- ❑ Looseness allows us to change contracts for everyone
- ❑ Different scripts share the same browser window
- ❑ They all share the basic types
- ❑ Modifying built-in functionality will break things

Breaking built-in types

```
Object.prototype.keys = function () {  
  var keys = [];  
  for (prop in this) {  
    keys.push(prop);  
  }  
  return keys;  
}
```

```
var myKeys = {foo: "foo", bar: "bar"}.keys();  
console.debug(myKeys); // [foo, bar, keys];
```

Constructor functions

- ❑ No classes in JavaScript, so how do we define new objects?
- ❑ Instantiate a function using the new keyword
- ❑ Any function can be used as a constructor
- ❑ Conventional to use CamelCaseLikeThis.

Constructor functions

```
function Apple(type, colour) {  
  this.type = type;  
  this.colour = colour;  
};
```

```
var macintosh = new Apple("macintosh", "red");
```

Context and this

- ❑ JavaScript `this` pointer seems wild and unpredictable
- ❑ It points to different objects depending on the context (eg. global)
- ❑ Subtle, confusing, and powerful

that

Plain old functions and objects

```
// Just use plain old functions and objects.
function orange () {

    // Stable pointer to the current instance.
    var that = {};

    // Anything private stays inside here.
    // For public methods, just add properties.
    that.squeeze = function () {...}

    return that;
}
```

Closures

- ❑ Functions can be defined inside other functions
- ❑ Inner functions have access to the outer function's variables
- ❑ A closure is formed by returning the inner function from the outer function
- ❑ The inner function will still have access to all the variables from the outer function

Closure example

```
function addNumbers (a, b) {
```

```
  function addEmUp (c) {  
    return a + b + c;  
  }
```

```
  return addEmUp;  
}
```

```
var add = addNumbers(1, 2); // result is an "add 3" Function  
add(3); // Result is 6  
add(5); // Result is 8
```

A spiral-bound notebook with a white page and a dark blue cover. The spiral binding is visible at the top edge.

Toolkits

Foundational Toolkit

- Thousands of them ?
 - Single problem solutions
 - Widgets

JavaScript is hard ?

NO

This is hard

- ❑ browser inconsistencies and bugs
- ❑ complex data and user interfaces in web applications
- ❑ subtle and varied high-quality user interactions
- ❑ the call and response of asynchronous client-server interaction

Frameworks can help

- ❑ Browser Abstraction
- ❑ DOM traversal, selection, and manipulation
- ❑ easy and dynamic event binding
- ❑ quick, responsive, bullet-proof AJAX functionality

Criteria

- ❑ Cross-browser support
- ❑ Easy debugging
- ❑ Event abstraction
- ❑ A solid DOM manipulation library
- ❑ A strong community and clear roadmap for improvements
- ❑ Accessibility

jQuery

Write less - Do more

<http://jquery.com>

Finding something

- `jQuery("<selector>")`
- selectors =

tags: `jQuery("tr")`

ids: `jQuery("#myId")`

classes: `jQuery(".myClass")`

pseudo tags: `jQuery("div:first")`

Finding something

- `jQuery("<selector>")`
- more selectors = combining selectors

element by class: `jQuery("li.selected");`

relationships: `jQuery("tbody tr:even");`

children: `jQuery("div > p");`

siblings: `jQuery("div ~ p");`

etc, etc, etc...

Doing something

```
function stripeListElements(listId) {  
  jQuery('#' + listId + " li:even").addClass("odd");  
}
```

jquery === \$

Doing something

```
$(".some-hidden-thing").show();  
$(".some-hidden-thing").fadeIn("slow");  
$("<li>A new list item</li>").appendTo("#myList");  
$("#myList li:last").replaceWith("<li>A new list item</li>");  
$("div.container").clone().appendTo("body");
```

Doing something

```
$("#div.container").clone().appendTo("body");
```

chaining...

```
$("#div#mytemplate").addClass('menu')  
  .clone()  
    .appendTo("body")  
      .click(dosomething());
```

Attaching events

```
$(".button").click(function(){
    doSomething();
});
$(".button").hover(function(){
    jQuery(this).addClass("hilite");
}, function(){
    jQuery(this).removeClass("hilite");
});
$(".button").focus(function(){
    jQuery(this).addClass("hilite");
});
$(".button").blur(function(){
    jQuery(this).addClass("hilite");
});
```

Online documentation

<http://jquery.com>

SData.js - Ajax

- Allows multipart file upload
- Has a login handler that checks logins

SData.js - Ajax

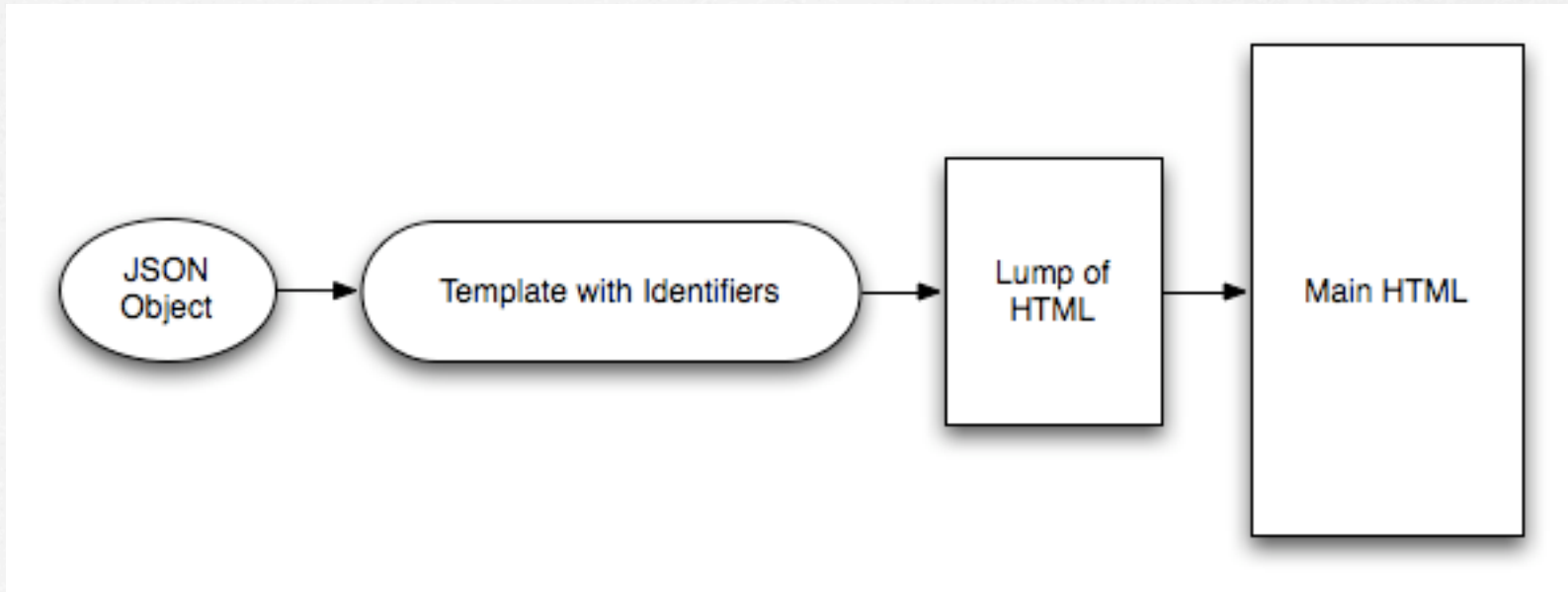
```
var parameters = {"sitename" : sitetitle,
"sitedescription" : sitedescription, "siteid" : siteid,
"type" : type };

sdata.Ajax.request({
  url :url,
  httpMethod : "POST",
  onSuccess : function(data) {
    renderList(newjson);
  },
  onFail : function(status) {
    alert("An error has occurred");
  },
  postData : parameters,
  contentType : "application/x-www-form-urlencoded"
});
```

```
sdata.Ajax.request({
  httpMethod: "GET",
  url: "/sdata/me?sid=" + Math.random(),
  onSuccess: function(data){
    var me = eval('(' + data + ')');
    doSomething(me);
  },
  onFail: function(status){
    alert("An error has occurred");
  }
});
```


SData.js - Templating

- Trimpath
- Similar to PHP smarty
- Easy changes



SData.js - Templating

```
<div id="sitelist_template" style="display:none"><!--  
  <ul class="sites-menu">  
    <li><a href="#">Uncategorized</a>  
      <ul>  
        {for site in items}  
          <li><a href="/dev/site_home_page.html?siteid=${site.id}"  
class="sites-menu-blue">${site.title}</a></li>  
        {/for}  
      </ul>  
    </li>  
  </ul>  
--></div>
```

```
var renderList = function(json){  
  $("#sitelist",rootel).html(sdata.html.Template.render('sitelist_template', json));  
}
```

QueryString.js

□ Read QueryString parameters

```
var qs = new Querystring();  
var siteId = qs.get("site", false);  
  
if (siteId) {  
    siteJsonUrl = "/direct/site/" + siteId + ".json";  
} else {  
    alert("invalid site id");  
}
```

Others

- jQuery UI (<http://ui.jquery.com>)
- SWFUpload (<http://swfupload.org>)
- RSH (<http://code.google.com/p/reallysimplehistory/>)
- Others ...

A spiral-bound notebook with a white page and a black spiral binding at the top. The text "JavaScript a1 1y" is written in the center of the page.

JavaScript a1 1y

DHTML

- The 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

=> Fluid Infusion

Status

- ARIA standard (in progress)
- KeyBoard accessibility
 - => Fluid infusion
 - => jquery keyboard a11y plugin
- Provide flexible styling and presentation
 - => just started off

Keyboard a11y

My Profile



Upload new picture

Browse...

Upload

Basic

Show all fields

Status: *Sakai is watching other people on Sakai*

First Name: Sakai
Middle Name: Q.
Last Name: Administrator

About

No fields filled out yet

Interests

No fields filled out yet

University Contact Info

No fields filled out yet

Home Contact Info

No fields filled out yet



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My Profile My People My Inbox

Tools Show settings

- Add Tools
- Home
- Users
- Aliases
- Sites
- Realms
- Workspace Setup
- MOTD
- Resources
- On-Line
- Memory
- Site Archive
- Job Scheduler
- Become User
- User Membership
- Polls

Sites Show settings

Join a Site | Edit Site List | Create a Site

- Portfolio's
 - Nicolaas Matthijs
 - Portfolio 1
 - Portfolio2
 - Portfolio
 - test15
 - test19
- Uncategorized
 - Sakai Administrator
 - Admin Test
 - Administration Workspace
 - Authoring
 - Belgian Gardening
 - CARET
 - Citations Admin
 - Famous monuments
 - Helpdesk Issues
 - Joe's New Site
 - John's Test Site
 - mercury site
 - Old Legacy Site
 - Painters and Paintings
 - PortfolioTemplate
 - Ray's Test
 - Roskilde University
 - testsite

My Profile Show settings

Edit Profile | View Profile

Sakai Administrator
Status: Online

is watching other people on Sakai

No Connection Requests

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

Setting Tabindex

```
// Put the tab list in the tab order.  
jQuery("#animalTabs").tabindex(0);
```

```
// Remove the individual tabs from the tab order.  
// We'll focus them programmatically with the arrows.  
jQuery("#animalTabs li").tabindex(-1);
```

Navigating with arrow keys

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

Activation handlers

```
// Make each tab activatable with Enter & Spacebar  
tabs.activatable(function(aTab) {  
    alert("You just selected: " + aTab.text());  
});
```

A spiral-bound notebook with a white page. The spiral binding is at the top. The word "CheckList" is written in the center of the page in a bold, black, sans-serif font.

CheckList

CheckList

- Create new folder

▶	announcementupdates	3 November 2008, 16:23	--	Folder
▶	chat	16 Novemb...2008, 14:59	--	Folder
▶	comments	12 Novemb...2008, 11:04	--	Folder
▶	contactinformation	3 November 2008, 16:23	--	Folder
▶	createsite	16 Novemb...2008, 12:24	--	Folder
▶	form	3 November 2008, 16:23	--	Folder
▶	helloworld	3 November 2008, 16:23	--	Folder
▶	MELBOURNE	3 November 2008, 16:23	--	Folder
▶	myfriends	10 Novemb...2008, 11:23	--	Folder
▶	myinbox	3 November 2008, 16:23	--	Folder
▶	mypreferences	3 November 2008, 16:23	--	Folder
▶	myprofile	3 November 2008, 16:23	--	Folder
▶	navigation	3 November 2008, 16:23	--	Folder
▶	pagemanagement	3 November 2008, 16:23	--	Folder
▶	poll	3 November 2008, 16:23	--	Folder
▶	polltracker	3 November 2008, 16:23	--	Folder
▶	Resources	3 November 2008, 16:23	--	Folder
▶	singlefile	3 November 2008, 16:23	--	Folder
▶	sites	Yesterday, 21:32	--	Folder
▶	sparkline	3 November 2008, 16:23	--	Folder
▶	timeplot	3 November 2008, 16:23	--	Folder
▶	tools	3 November 2008, 16:23	--	Folder
▶	WEB-INF	3 November 2008, 16:23	--	Folder
▶	youtubevideo	3 November 2008, 16:23	--	Folder

Checklist

- *Make the right directories*

▶	css	3 November 2008, 16:23	--	Folder
▼	images	Today, 10:37	--	Folder
	logo_inst.gif	Today, 10:36	4 KB	Graph...Image
▼	javascript	Today, 10:33	--	Folder
	melbourne.js	3 November 2008, 16:23	24 KB	JavaSc... script
	melbourne.html	3 November 2008, 16:23	16 KB	HTML ...ment

Checklist

□ Fill in HTML

```
<div id="melbourne_settings" style="display:none">
```

```
</div>
```

```
<div id="melbourne_output" style="display:none; border: 1px solid #CCCCCC; width:400px; padding: 5px">
```

```
</div>
```

```
<script type="text/javascript" language="JavaScript" src="/devwidgets/MELBOURNE/javascript/  
melbourne.js"></script>
```

Checklist

□ Fill in JavaScript

```
var sakai = sakai || {};  
  
sakai.melbourne = function(tuid, placement, showSettings){  
    // To Do: Code  
};  
  
sdata.widgets.WidgetLoader.informOnLoad("melbourne");
```

Checklist

□ Register + Define

```
melbourne :  
{  
  description:"MELBOURNE",  
  iframe:0,  
  url:"/devwidgets/MELBOURNE/melbourne.html",  
  name:"Melbourne",  
  id:"melbourne",  
  personalportal:0,  
  siteportal:0,  
  ca:1,  
  img:"/devwidgets/MELBOURNE/images/logo_inst.gif"  
}
```

Checklist

□ Get started

```
var sakai = sakai || {};  
sakai.melbourne = function(tuid, placement, showSettings){  
  
    var rootEl = $("#" + tuid);  
  
    var loadSettings = function(){  
        $("#melbourne_settings").show();  
        $("#melbourne_settings").html("Showing settings");  
    }  
    var showPreview = function(){  
        $("#melbourne_output").show();  
        $("#melbourne_output").html("Showing settings");  
    }  
  
    if (showSettings){  
        loadSettings();  
    } else {  
        showPreview();  
    }  
};  
  
sdata.widgets.WidgetLoader.informOnLoad("melbourne");
```

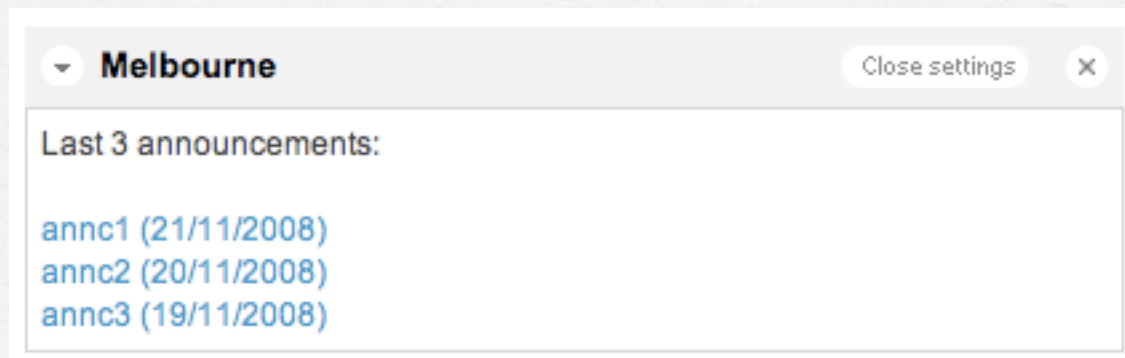
Checklist

□ AJAX example

```
sdata.Ajax.request({
  url : "/sdata/f/" + placement + "/" + tuid + "/configuration?
  sid=" + Math.random(),
  httpMethod : "GET",
  onSuccess : function(data) {
    var json = eval('(' + data + ')');
    numberToDisplay = json.number;
    getAnnouncements();
  },
  onFail : function(status) {
    showVideo(status, false);
    getAnnouncements();
  }
});
```

Example

- Last x announcements widgets



A spiral-bound notebook with a white page. The spiral binding is at the top. The text "Q & A" is centered on the page.

Q & A