

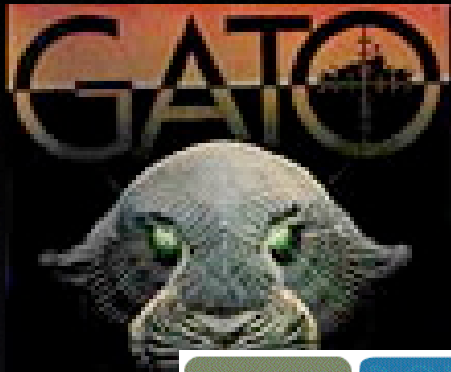
*proto***kit**

Prototyping the Rich Web Experience

Experiment in Creating a Prototyping JavaScript Framework

Bill Scott
Yahoo! Ajax Evangelist
b.scott@yahoo.com

stuff i've done



Rico

JavaScript for Rich Internet Applications

Home Features Demos Documentation Downloads

An open-source JavaScript library for creating rich internet applications. Rico provides full Ajax support, drag and drop management and a cinematic effects library.

BACKGROUND

Rico is a Spanish word meaning *rich*. The goal of Rico is to provide a rich experience for web sites using Ajax technology.

Rico is just one small part of a larger effort at Sabre Airline Solutions to create a suite of rich internet components, behaviors and effects for the web application space.

The library is a fully object-oriented JavaScript library. Recently we refactored the library to extend the excellent *prototype* effort from the Ruby on Rails folks.

OPEN SOURCE

Rico is provided free and open-source (Apache 2.0 License) for either your personal or commercial use. Sabre Airline Solutions retains the copyright on the Rico code produced at Sabre.

BROWSER SUPPORT

Rico has been tested on IE 5.5, IE 6, Firefox 1.0x/Win, Camino/Mac, Firefox 1.0x/Mac. Currently there is no Safari or Mac IE 5.2 support. Support will be provided in a near future release for Safari.

AJAX SUPPORT

Ajax is the term that describes techniques for creating interactive web interfaces. Rico provides a very simple interface for Ajax response objects as Ajax response objects may be updated as they are received.

Want to get started learning? Then read our two Ajax tutorials.

DRAW AND DROP

Desktop applications have long interfaces to simplify user interaction. Rico provides the simplest interfaces for enabling drag and drop. Just use the JavaScript object as a draggables handles the rest.

CINEMATIC EFFECTS

When actions are no longer required to clue the user on what transitions can communicate. Rico provides several cinematic effects as well as some simple visual style effects in a very simple interface.

BEHAVIORS

Take some raw HTML and sprinkle in some behaviors and what do you get? Well in Rico you can get an *Accordion* component like those found in Macromedia Flex and Laszlo. Just nest some DIVs and with one line of JavaScript turn your div panels into an accordion. And the latest behavior is the LiveGrid. LiveGrid allows you to connect an HTML table up to a stream of Ajax responses. Ajax requests are automatically called during table scrolling. The result is now HTML tables can hold an unlimited amount of data scrolled into view on the fly as needed! More behaviors are planned!

[Developer Network Home](#) [Help](#) Site Search Search

YAHOO! DEVELOPER NETWORK

Design Pattern Library

[Yahoo! Developer Network](#) > Design Pattern Library

USER NEEDS TO

NAVIGATE

- [Breadcrumbs](#)
- [Faceted Navigation](#)
- [Fly-out Menus](#)
- [Horizontal Bar](#)
- [Hub and Spoke](#)
- [Left Navigation](#)
- [Tabs](#)
 - [Module Tabs](#)
 - [Navigation Tabs](#)

EXPLORE DATA

- [Auto Complete](#)
- [Calendar Picker](#)
- [Pagination](#)
 - [Item Pagination](#)
 - [Search Pagination](#)

ORGANIZE DATA

GIVE FEEDBACK

- [Ratings & Reviews](#)
 - [Architecture Review](#)
 - [Rating an Object](#)
 - [Writing a Review](#)

PERFORM ACTION

CUSTOMIZE

- [Drag and Drop](#)
 - [Drag and Drop Modules](#)
 - [Drag and Drop Objects](#)
- [In Page Editing](#)
- [Sliders](#)

APPLICATION NEEDS TO

CALL ATTENTION

IMPROVE READABILITY

- [Ratings & Reviews](#)
 - [Review Architecture](#)

GROUP RELATED ITEMS

ORGANIZE SCREEN/PAGE

Welcome

Welcome to the Yahoo! Design Pattern Library. We are very happy to be sharing our library with the design and development community. This is our first drop of what we hope to be a monthly release cycle for the publication of patterns. In many cases we have bundled the patterns with pointers to related code from the [Yahoo! User Interface Code Library](#). We hope this is a useful resource and look forward to your [feedback](#).

What's a Pattern?

A pattern describes an optimal solution to a common problem within a specific context. [more...](#)

Recent Patterns

Auto-Complete

The user needs to enter an item into a text box which could be ambiguous or hard to remember and therefore has the potential to be mis-typed.

Breadcrumbs

User needs to navigate potentially large quantities of information efficiently, without becoming lost.

Drag and Drop Modules

The user needs to re-arrange the layout of modules on a web page directly with the mouse.

Module Tabs

The user needs to navigate through one or more stacked panes of content without refreshing the page.

Navigation Tabs

The user needs to navigate through a site to locate content and features and have clear indication of their current location in the site.

Object Pagination

The user needs to view data items from a potentially large set of sorted data that will not be easy to display within a single page.

Search Pagination

The user needs to view a set of search results ranked by relevance that is too large to easily display within a single page.

Rating an Object

A user wants to quickly leave their opinion on an object, with minimal interruption to any other task flow they are involved in.

Writing a Review

User wants to share her opinion with others about an object (place, person, thing) in greater detail than a simple rating.

See Rico in Action!

YAHOO! GOBBLER™

Scratchpad

[Add Website to Scratchpad](#)

Projects(3)

National Mapping - Fab Facts, Landforms

<http://www.ga.gov.au/education/fabfacts/>

Geography: Landforms

[Add Website to Project](#)

Civil War Battles

[Add Website to Project](#)

Create a new Project

prototyping

- Have been involved with prototyping for a number of years
- Last summer wrote a quick dragdrop proto library that was based on CSS class names and associating behavior to these classes ('dragme', 'drophere')
 - Goal was to make it easy for designers to start prototyping
 - However it was not possible to provide enough logic without resorting to writing code
 - Been planning to get back to the idea for a year.
- *proto***kit** is an experiment in designing a toolkit for prototyping with DHTML/Ajax

what we will discuss

- quick overview of common design patterns (behaviors)
- quick survey of techniques to prototype a rich web experience
- dive into protokit and discuss how it can be used to quickly sprinkle behaviors into web pages
- look at similar techniques emerging (jQuery, css behaviors, DED | Chain, etc.

patterns
(common interaction behaviors)

ria patterns

invitation. cursor invitation. hover invitation. tooltip invitation. page invitation. drop invitation. available. selected. auto complete. live suggest. refining search. dynamic filtering. live search. on-demand scrolling. deferred content loading. fresh content. on-demand content. periodic refresh. resizable modules. scrolling modules. hover detail. narrowing actions. narrowing choices. auto form fill. in-place drill down. dependent choices. look before you leap. drag and drop. drag and drop modules. drag and drop objects. persistent portals. in page edit. inline text edit. inline custom edit. direct state edit. rating an object. inline custom edit. inline tag edit. popup custom edit. grid cell edit. slide out custom edit. module configure. module flip configure. module inline configure. module slide out configure. module faceplate. expandable content. in-context tools. in-context links. in-context hover menu. silent submit. remembered collection. auto save. remembered preferences. hover spy. inline assistant. inline validation. validate then suggest. indicator. busy indicator. progress indicator. inline status. in-context busy. cursor busy. opacity fade. high contrast. balloon error tip. dynamic goal. opacity focus. detail zoom. lightbox. transition. brighten. cross-fade. dim. expand. fade-in. fade-out. flip. move. self-heal. collapse. slide. animate.

Design Pattern Library

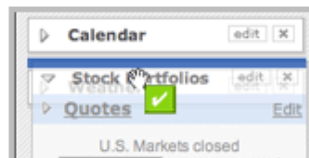
[Yahoo! Developer Network](#) > [Design Pattern Library](#) > [Patterns from A to Z](#)

Patterns from A to Z



[Alphanumeric Filter Links](#)

The user needs the ability to look up information alphabetically within a large data set.



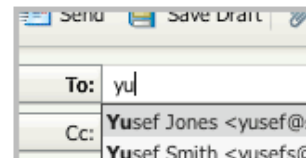
[Animate Transition](#)

The designer needs to communicate that an object is changing its spatial relationship within the page.



[Architecture of a Review](#)

A product or website needs to present ratings and reviews with a variety of informational elements.



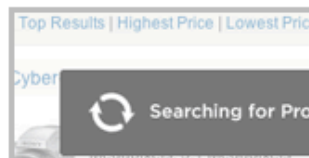
[Auto Complete](#)

The user needs to enter an item into a text box which could be ambiguous or hard to remember and therefore has the potential to be mis-typed.



[Breadcrumbs](#)

User needs to navigate potentially large quantities of information efficiently, without becoming lost.



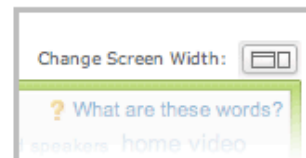
[Brighten Transition](#)

Designer wants to make a previously dimmed object a point of focus by making the object bright again.



[Calendar Picker](#)

User wants to find or submit a particular piece of information based on a date or between a date range.



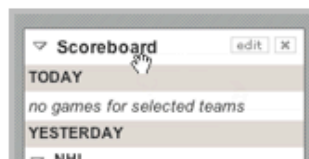
[Collapse Transition](#)

The designer needs to communicate that an object is no longer of primary importance, yet wants to keep it available in a smaller form.



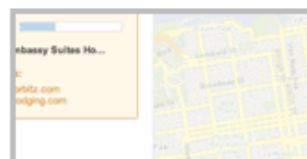
[Cross Fade Transition](#)

Designer wants to communicate that a new view of an object is replacing the previous view.



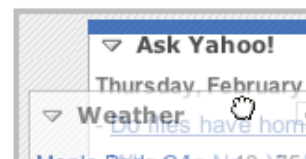
[Cursor Invitation](#)

Designer needs to cue the user that an object can be interacted with.



[Dim Transition](#)

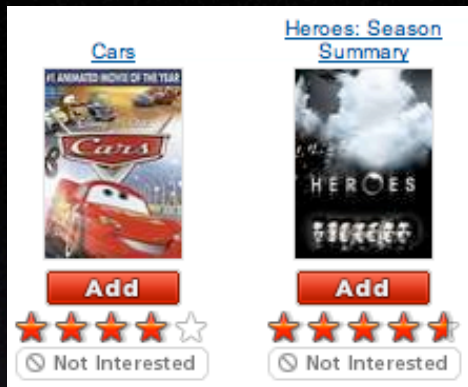
Designer needs to communicate that an object is of secondary importance.



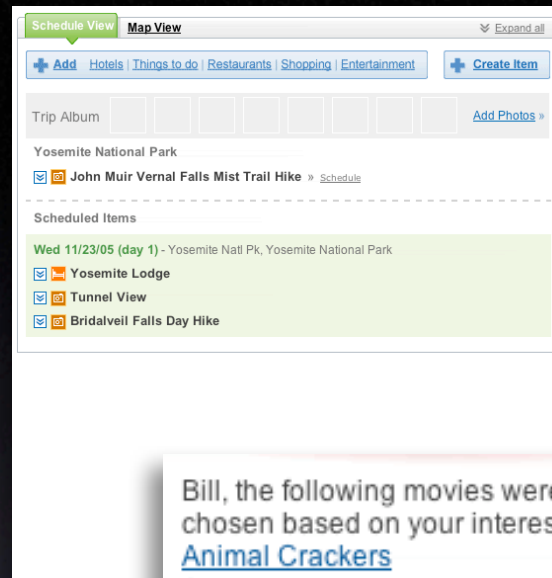
[Drag and Drop Modules](#)

The user needs to re-arrange the layout of modules on a web page directly with the mouse.

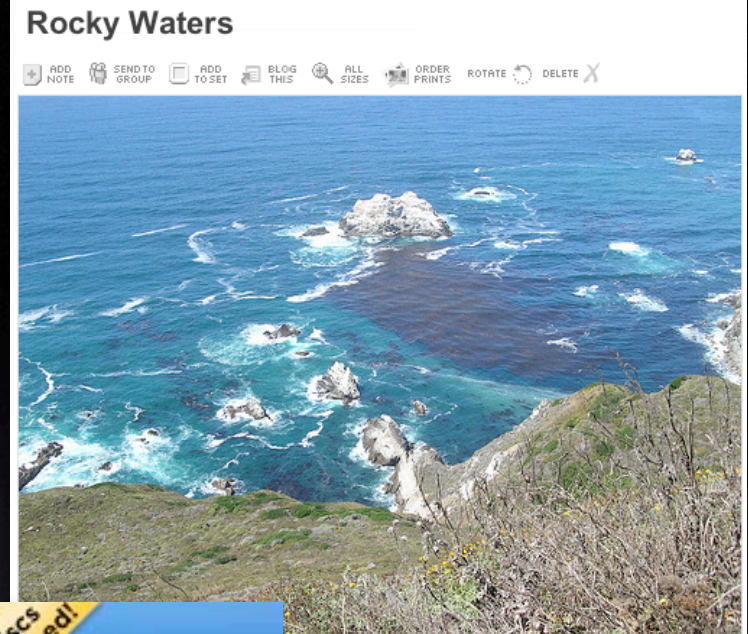
ria pattern examples



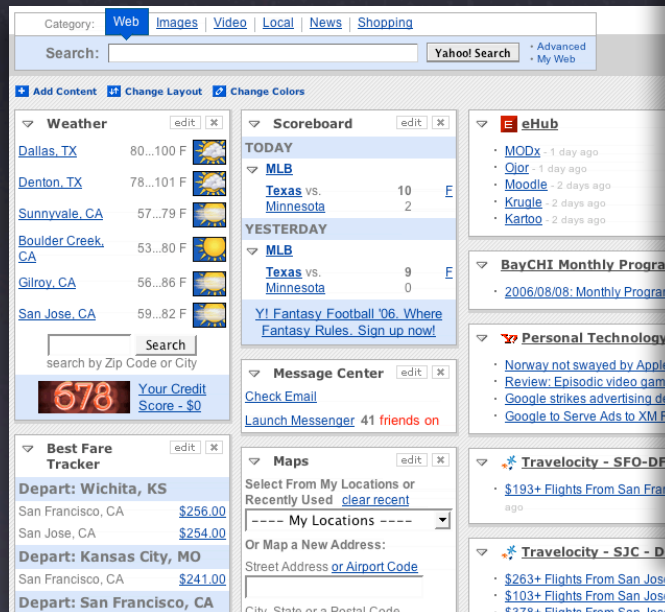
pattern. in-page action.



pattern.



editing.



pattern. drag & drop.

Bill, the following movies were chosen based on your interest in:
[Animal Crackers](#)
[Something the Lord Made](#)
[X2: X-Men United](#)



Monkey Business

★★★★★

One of the Marx Brothers' funniest movies, the title of the film says it all as Groucho, Harpo, Chico and Zeppo stow away on a luxury liner. Before ... [Read More](#)



Lackawanna Blues

All Discs Guaranteed!

You loved it.

Now own it for just **\$5.99**

- FREE shipping
- original artwork
- hardcover case

[Shop now](#) for our previously viewed titles low as \$5.99

at the Store

Juice

es

Rate Your

pattern. hover details.

Bill, the following movies were chosen based on your interest in:

- [Animal Crackers](#)
- [Something the Lord Made](#)
- [X2: X-Men United](#)

Monkey Business

One of the Marx Brothers' funniest movies, the title of the film says it all as Groucho, Harpo, Chico and Zeppo stow away on a luxury liner. Before ... [Read More](#)

Lackawanna Blues

You
loved it.

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- FREE shipping
- original artwork
- hardcover case

[Shop now](#) for our
previously viewed titles
low as \$

Titles, tags, and descriptions

- Rotate**
- Delete

All your photos 0 selected | SEARCH ▶ More options ▶ Jump to date range

153 of your photos :: 0 selected | [Select all](#)

Schedule View

Map View

Expand all

+

Add

[Hotels](#)

[Things to do](#)

[Restaurants](#)

[Shopping](#)

[Entertainment](#)

+

Create Item

Trip Album

[Add Photos](#)

Yosemite National Park

✓

📍

John Muir Vernal Falls Mist Trail Hike

»

[Schedule](#)

Scheduled Items

Wed 11/23/05 (day 1)

- Yosemite Natl Pk, Yosemite National Park

✓

📍

Yosemite Lodge

✓

📍

Tunnel View

✓

📍

Bridalveil Falls Day Hike

YAHOO! MAIL BETA

Welcome, **b.scott** Yahoo! | My Account, Switch Back

Search the Web... Search

Check Mail Compose

Find Messages... Go

Vonage: sign up & get 1 month free!

- Inbox
- Drafts
- Sent
- Spam (501) Empty
- Trash (3) Empty
- Contacts
- Calendar
- Notepad
- All RSS Feeds Add

My Folders Add

- dojo-mailist (4)
- ID Disc
- Karthik-Referrals
- Keep
- MerchantSpam (149)
- ux mail lists (1863)

What's your Credit Score?

Netflix-Try Free!
No Late Fees

Online Degree Programs

Inbox

2324 messages

Send Feedback | Options | Help ▾

Reply ↵ Forward ➡ Move ⇄ Print Print Spam Spam Delete Delete More ▾

	From	Subject	Received
	me	Re: rico question	Thu,
	Bill Scott	[Looks Good Works Well] 1/19/2006 01:13: Thu,	
	JDJ Industry Newsletter	Java Named "Programming Language of the Thu,	
	Travelocity Member Services	Price Alert! Flight + 5 Night Hotel to Honolulu Thu,	
	Theresa Neil	Re: Job Description	Thu,
	Damon Hougland	Job Description	Thu,
✉	Finan, Angelique	RE: Speaking Engagement Opportunity	Thu,
	David Schontzler	Re: [ng-dhtml] assert(), isNaNNumeric(), isOff Thu,	
	TagWorld	This week in TagWorld	Thu,
✉	me	rico question	Thu,
	Anonymous	[Looks Good Works Well] 1/19/2006 10:22: Thu,	
	Anonymous	[Looks Good Works Well] 1/19/2006 10:19: Thu,	
	Anonymous	[Looks Good Works Well] 1/19/2006 10:19: Thu,	
	Anonymous	[Looks Good Works Well] 1/19/2006 10:19: Thu,	

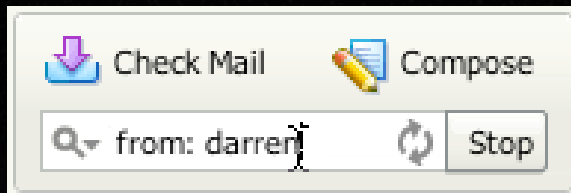
[Standard Header ▾](#) | [Hide Pane](#)

Got your eye on one of those messages up there?

To view your message down here in this handy Reading pane, just click on it
To select more than one, hold the Shift or Command key.

pattern. on-demand scrolling.

ria pattern examples

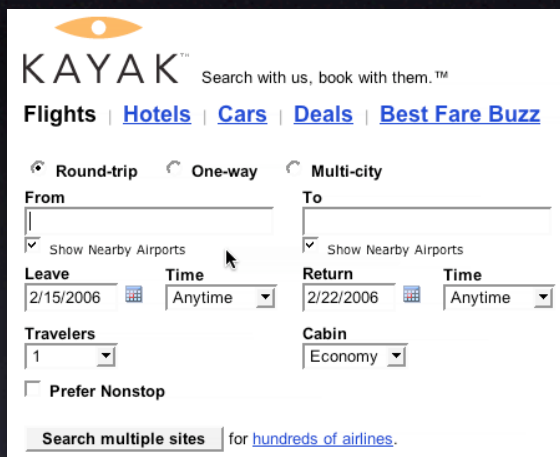


Check Mail Compose

from: darren

Stop

pattern. busy indicator.



KAYAK™ Search with us, book with them.™

Flights | Hotels | Cars | Deals | Best Fare Buzz

Round-trip One-way Multi-city

From To

Show Nearby Airports

Leave 2/15/2006 Time Anytime

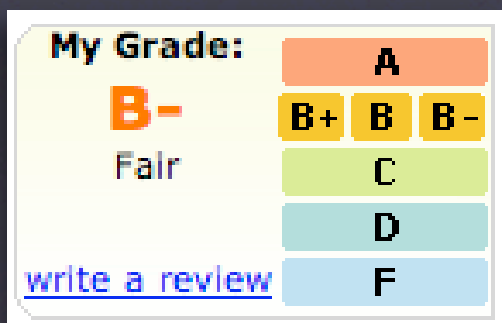
Return 2/22/2006 Time Anytime

Travelers 1 Cabin Economy

Prefer Nonstop

Search multiple sites for hundreds of airlines.

pattern. auto complete.

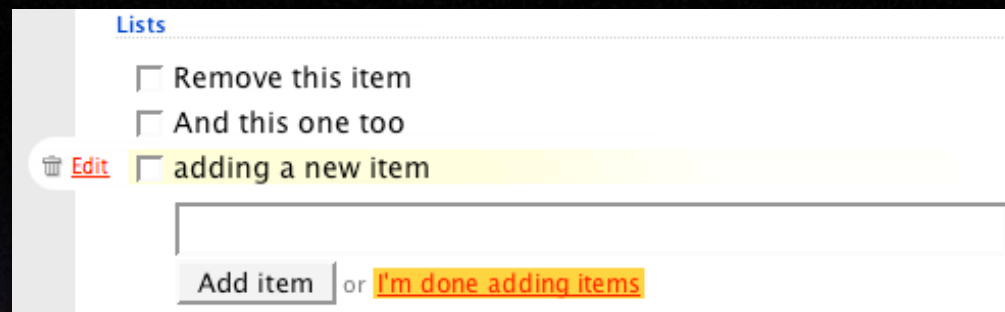


My Grade:

A		
B+	B	B-
C		
D		
F		

write a review

pattern. hover invitation.



Lists

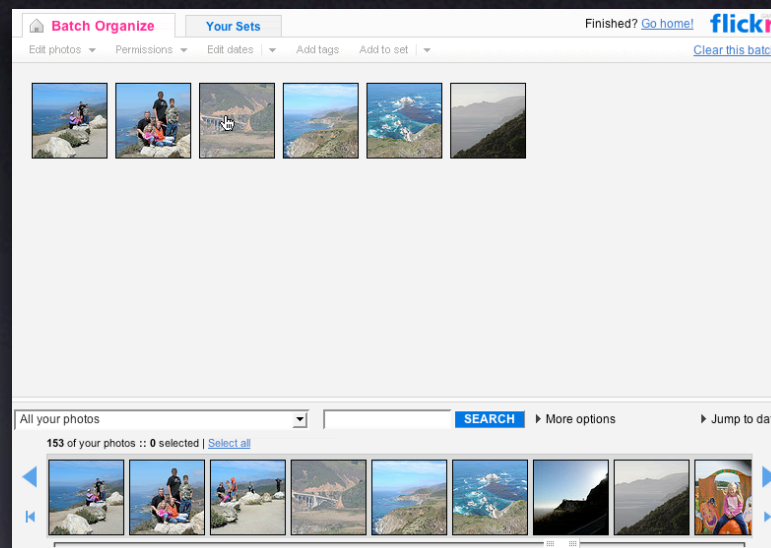
☐ Remove this item

☐ And this one too

☐ adding a new item

Add item or I'm done adding items

pattern. fade transition + self-healing transition.



Batch Organize Your Sets

Finished? Go home! flickr

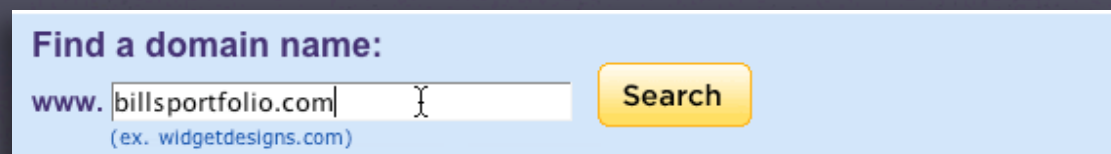
Edit photos Permissions Edit dates Add tags Add to set

Clear this batch

153 of your photos :: 0 selected | Select all

SEARCH More options Jump to date

pattern. drop invitation.



Find a domain name:

www. billsportfolio.com

(ex. widgetdesigns.com)

Search

pattern. live previews.

Drag Over
Invalid Target

Drag Over
Parent Container

Drop
Accepted

Drop
Rejected

Drop On
Parent Container



CSS Move cursor

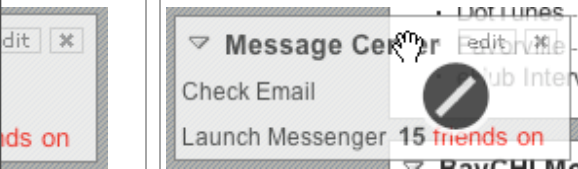


CSS Move cursor

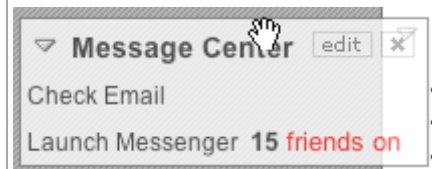
Normal Cursor

Normal Cursor

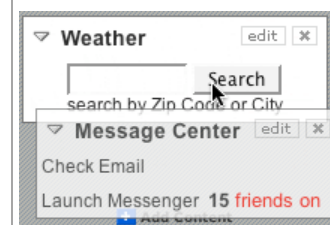
Normal Cursor



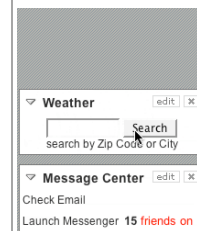
Reduced Opacity & Invalid Badge



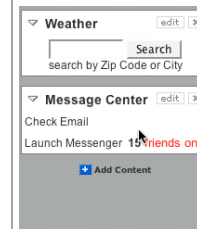
Reduced Opacity



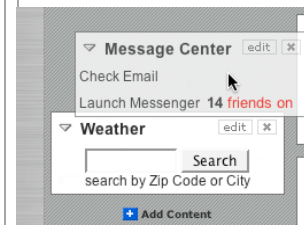
Modules animates into the area
just below insertion bar



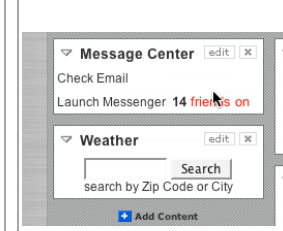
Module comes to rest in new
area



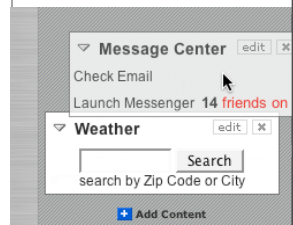
Modules slide up in a self-healing
transition to close hole



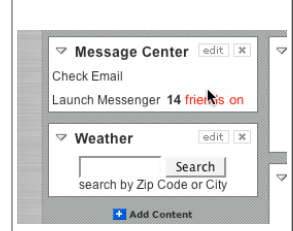
Modules animates back to
the home area



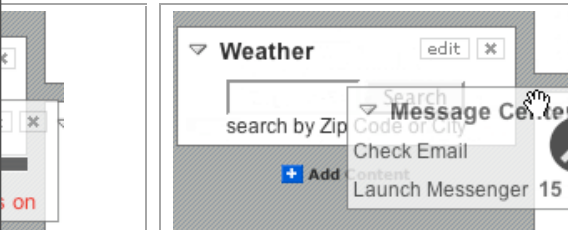
Module comes back to rest
at full opacity



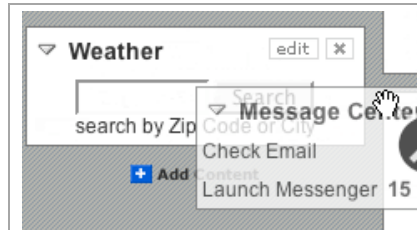
Modules animates back to
the home area



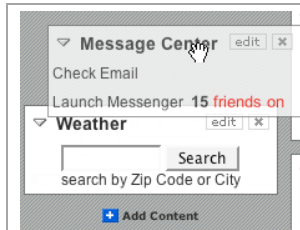
Modules comes back to
rest at full opacity



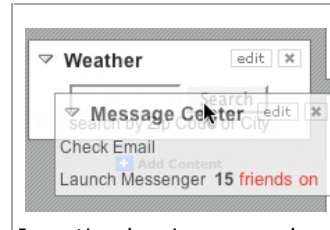
it will drop



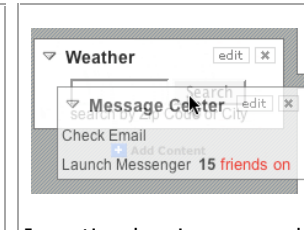
No insertion bar, just a gap



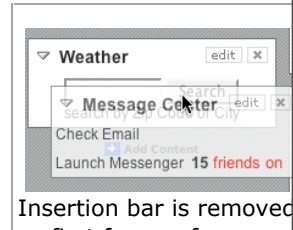
No insertion bar, just a gap & original hole



Insertion bar is removed as first
frame of animation



Insertion bar is removed
as first frame of animation



Insertion bar is removed
as first frame of animation

interesting moments for drag drop

	Page Generation	Mouse Hover	Drag Initiated	Drag over Valid	Drag over Invalid	Drag over Original	Drop Accepted	Drop Rejected	Drop on Original
Page Content	Hint	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cursor	Normal	Move Cursor	Move Cursor	Move Cursor	Move Cursor	Move Cursor	Normal	Normal	Normal
Drag Object	Normal	Normal	Reduced Opacity & Tracking	Reduced Opacity & Tracking	Reduced Opacity & Tracking + Invalid Badge	Reduced Opacity & Tracking	2. Modules animates into the area just below insertion bar 3. Module comes to rest in new area 4. Modules slide up in a self-healing transition to close hole	Normal Opacity + Zoom Back to Original	Normal Opacity + Zoom Back to Original
Orig Location	Normal	Normal	Hole Opens	Hole Remains	Hole Remains	Hole Remains	Hole Remains	Hole refilled with drag object	Hole refilled with drag object
Drop Target	Normal	Normal	Normal	Insertion Bar	N/A	N/A	1. Insertion Bar Removed	N/A	N/A

non-dhtml prototyping techniques

challenge of interesting moments



Wireframing AJAX is a bitch. The best our agency has come up with is the Chuck Jones approach: draw the key frames. Chuck Jones had an advantage: he knew what Bugs Bunny was going to do. We have to determine all the things a user might do, and wireframe the blessed moments of each possibility.

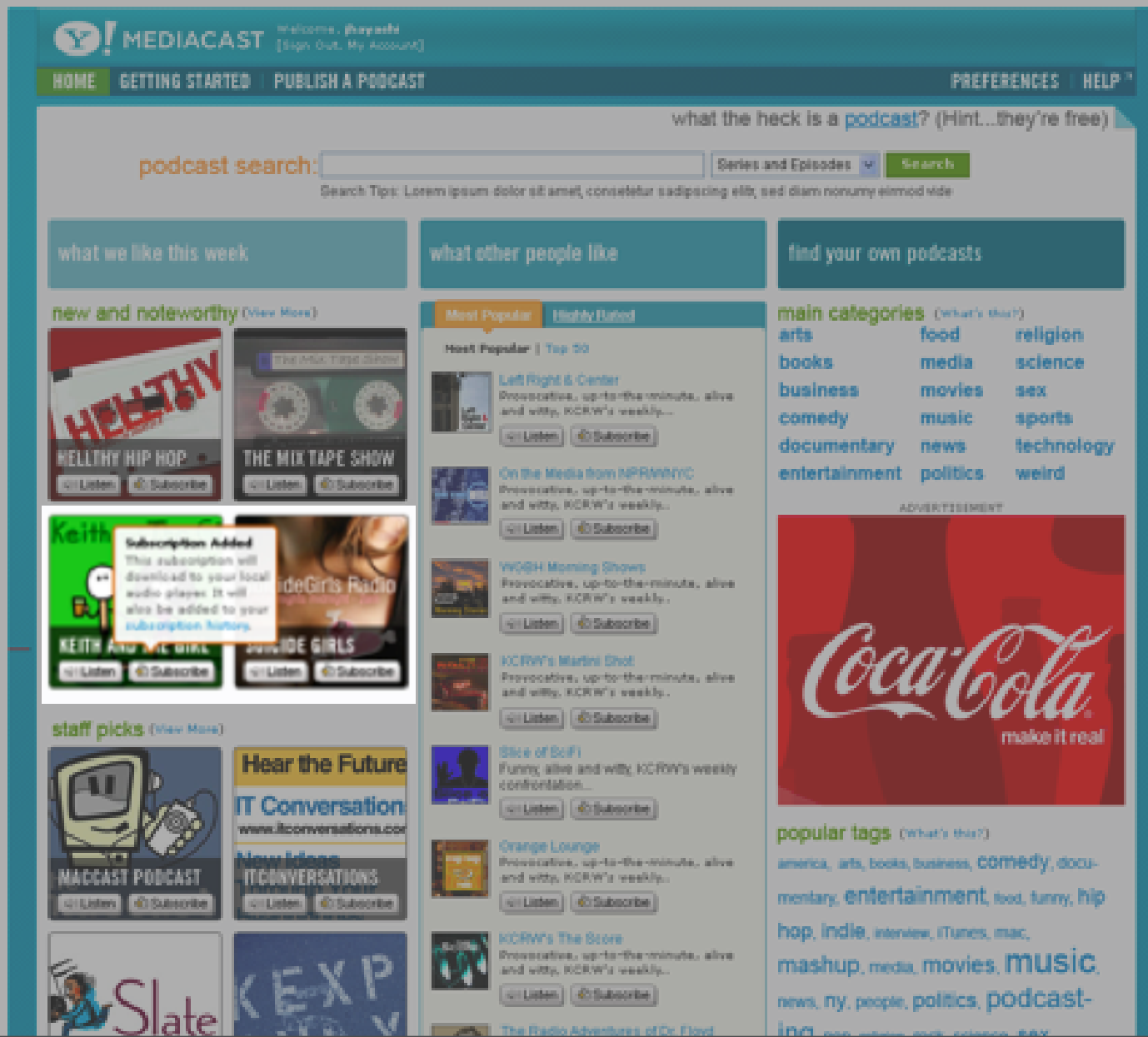
- Jeffrey Zeldman

<http://www.alistapart.com/articles/web3point0/>

- Blessed Moments = Microstates = Interesting Moments
 - behavior is not static
 - Multiple states need to be captured
 - Happens within a context
 - Not suited for wireframes

using keyframes

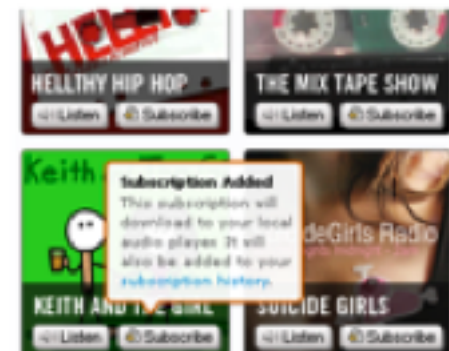
AJAX Status Interaction



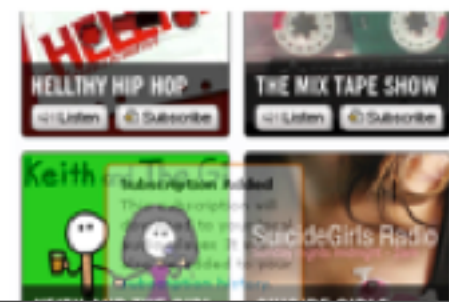
1. On Page Load



2a. On Click display message (listen and subscribe buttons have same

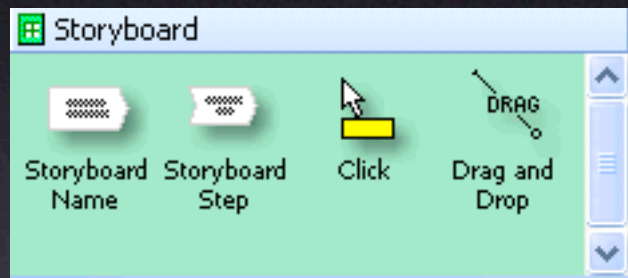


2b. Fade (50% opacity)



prototyping with visio

- Changes in state placed in different layers
- Storyboard steps toggle visibility of associated layers
- Each storyline serves as a use case in the wireframe



prototyping with keynote/powerpoint

- Slides make major steps
- Builds used to bring in transitions, animations

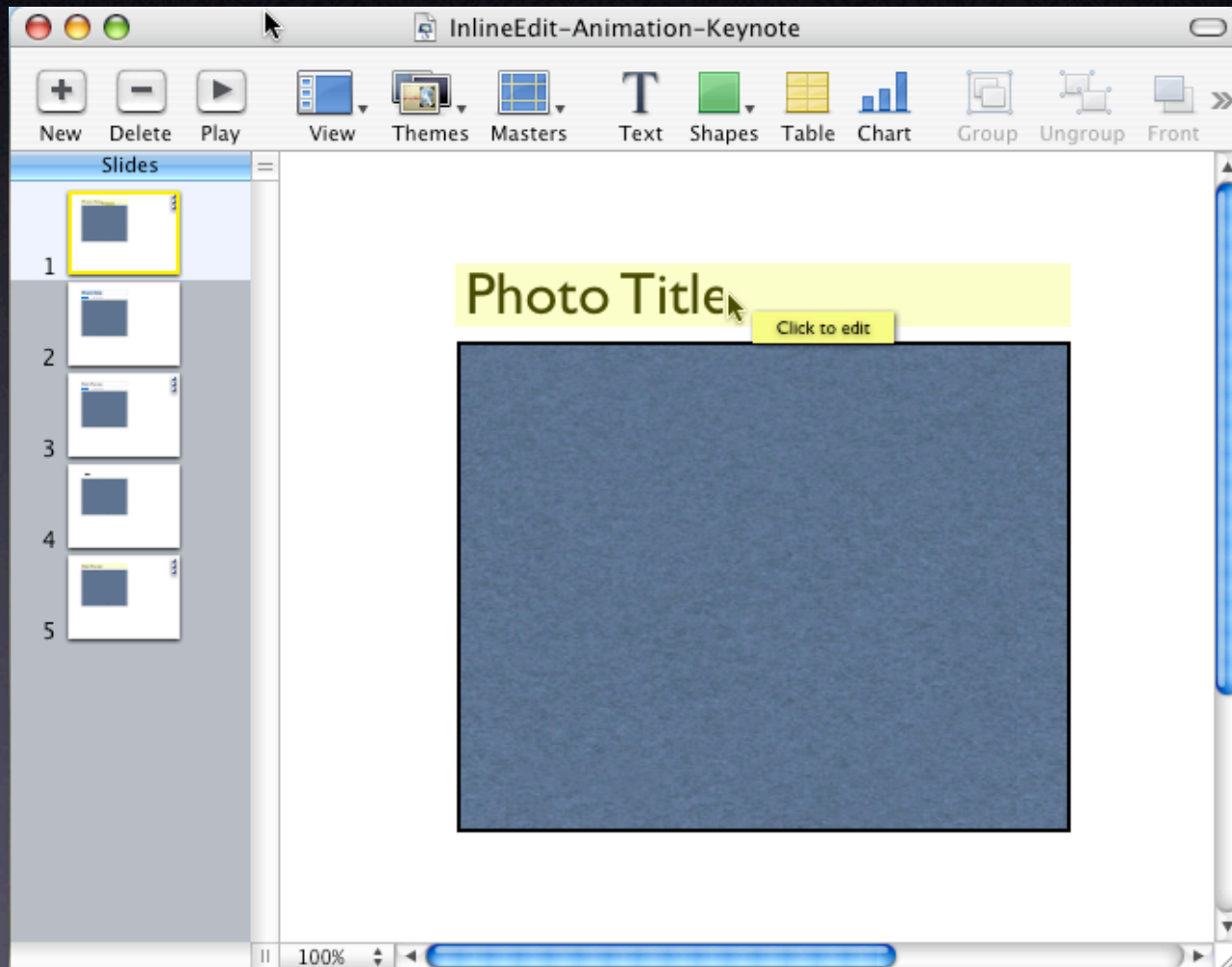
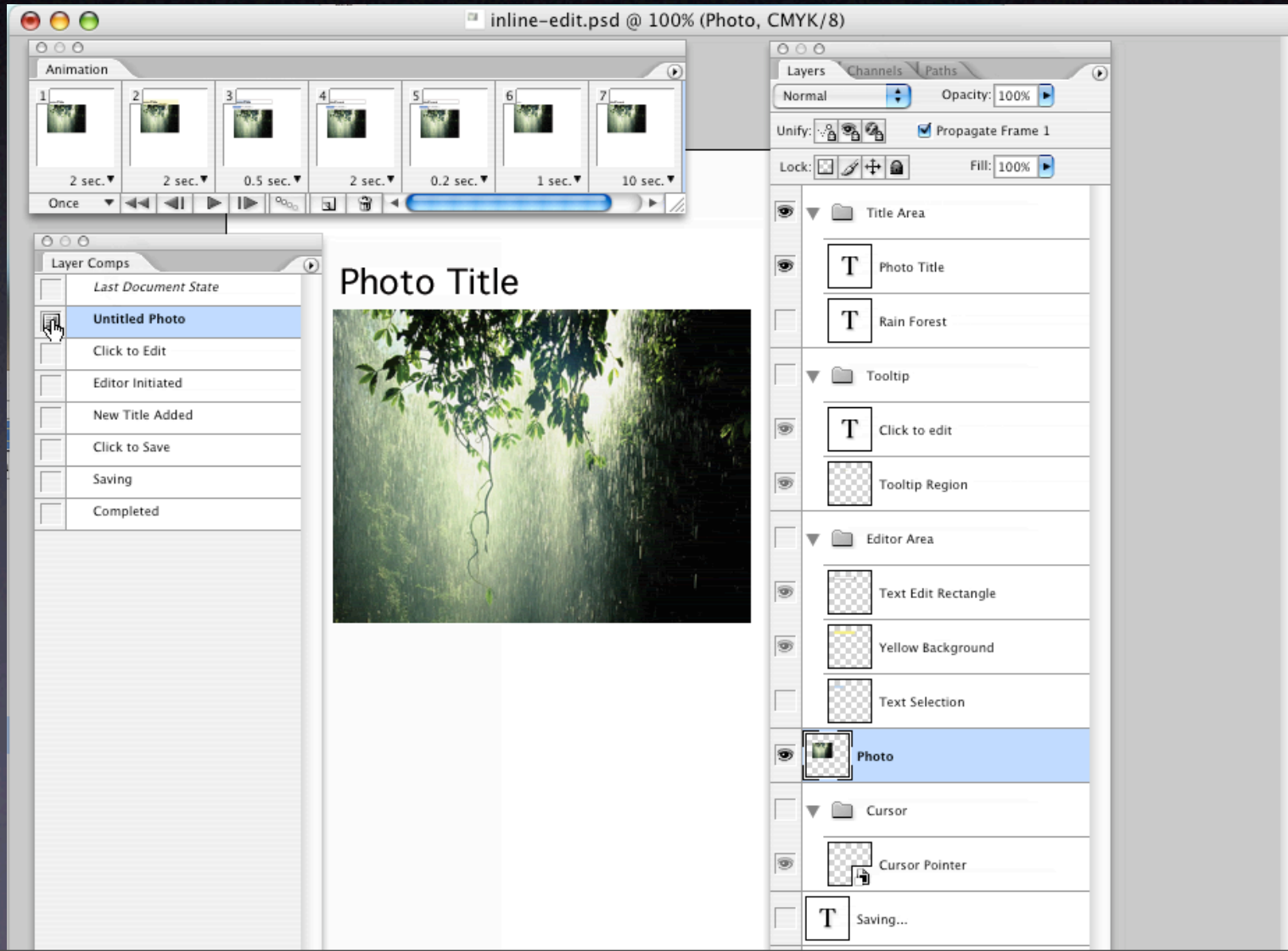


Photo Title



prototyping with photoshop

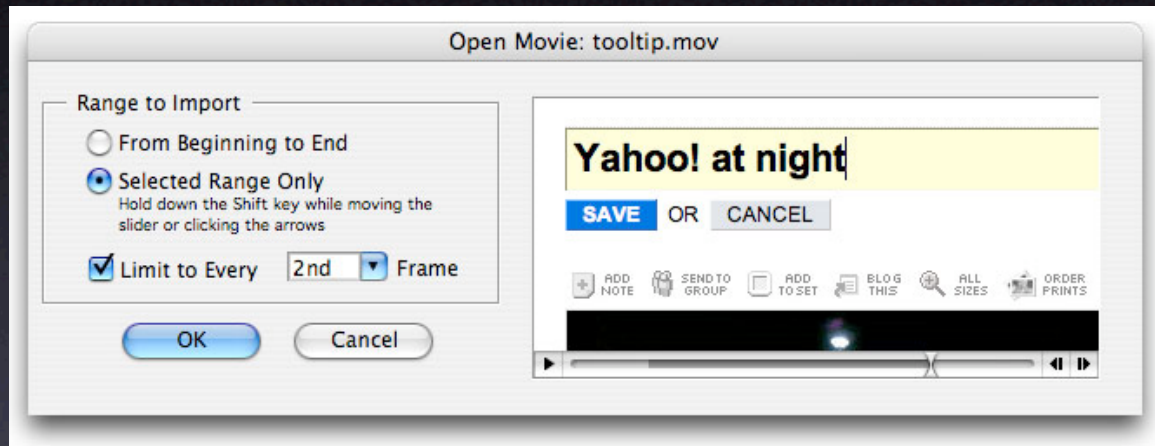
- Easy to create from a series of images
- Images can be created by hand or from other apps



animations from screencasts

Start with screencast (SnapZPro/SnagIt)

Turn movie into animated GIF (Adobe ImageReady)



other approaches

Flash

Flex

iRise (www.irise.com) \$\$\$

Axure (www.axure.com)

Interactive PDFs

Fireworks + PDF

Powerpoint

DHTML

dhtml prototyping

prototyping with DHTML

- Benefits
 - Can start simple and layer in complexity
 - Works well across different teams (design to code)
 - Technology the same or similar to final implementation
 - Most capable to approximate final result
 - Living example
- Disadvantages
 - Requires technical savvy
 - Bugs can suck down time
 - Too much time spent 'messaging with code'
 - Hard to extract into documentation

dhtml prototyping skills/techniques

- Keep structure, style and logic separate
 - Avoid adding onclick handlers in the HTML (unobtrusive)
 - Avoid any direct styles or html style tags (font, etc.)
- Use style class switching for visual changes
- Use CSS to simulate most mouse hover behavior
- Use innerHTML for content changes
- Understand when to use a class vs. id
- Use CSS query libraries for referencing interface parts
 - CSS selector syntax allows non-intrusive behavior injection

dhtml prototyping skills/techniques

- Use anchors as basic navigation/action hooks
- Use background images in CSS with style switching
- Use a grid layout system
 - YUI Grid
- Use Firebug
- Understand CSS Selectors
 - Ext, jQuery, Dojo, Mootools, Prototype, cssQuery()
- Use JSON syntax (options)

underlying desire for protokit

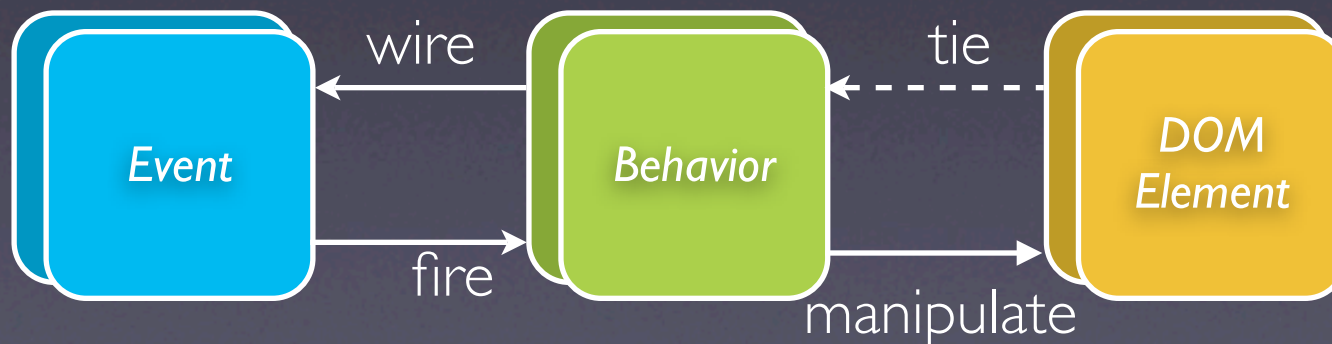
- address the conceptual phase of interface development
-- think “interaction theme”
(free from solving production issues)
- express an interaction as a configuration
(no code; declarative approach)
- dynamically insert interaction themes (behaviors) to any web page
(allows experimentation)
- create a gui tool for configuring & exploring interactions

protokit approach

- JSON used to express interaction theme to express relationship between dom elements, behaviors, attributes, and callbacks
- jQuery CSS Selector syntax for dom elements
- Chain dependent behavior as well as parallel behavior with JSON syntax
- Simple to add behaviors (class with 2 methods)
- Focus is on prototyping

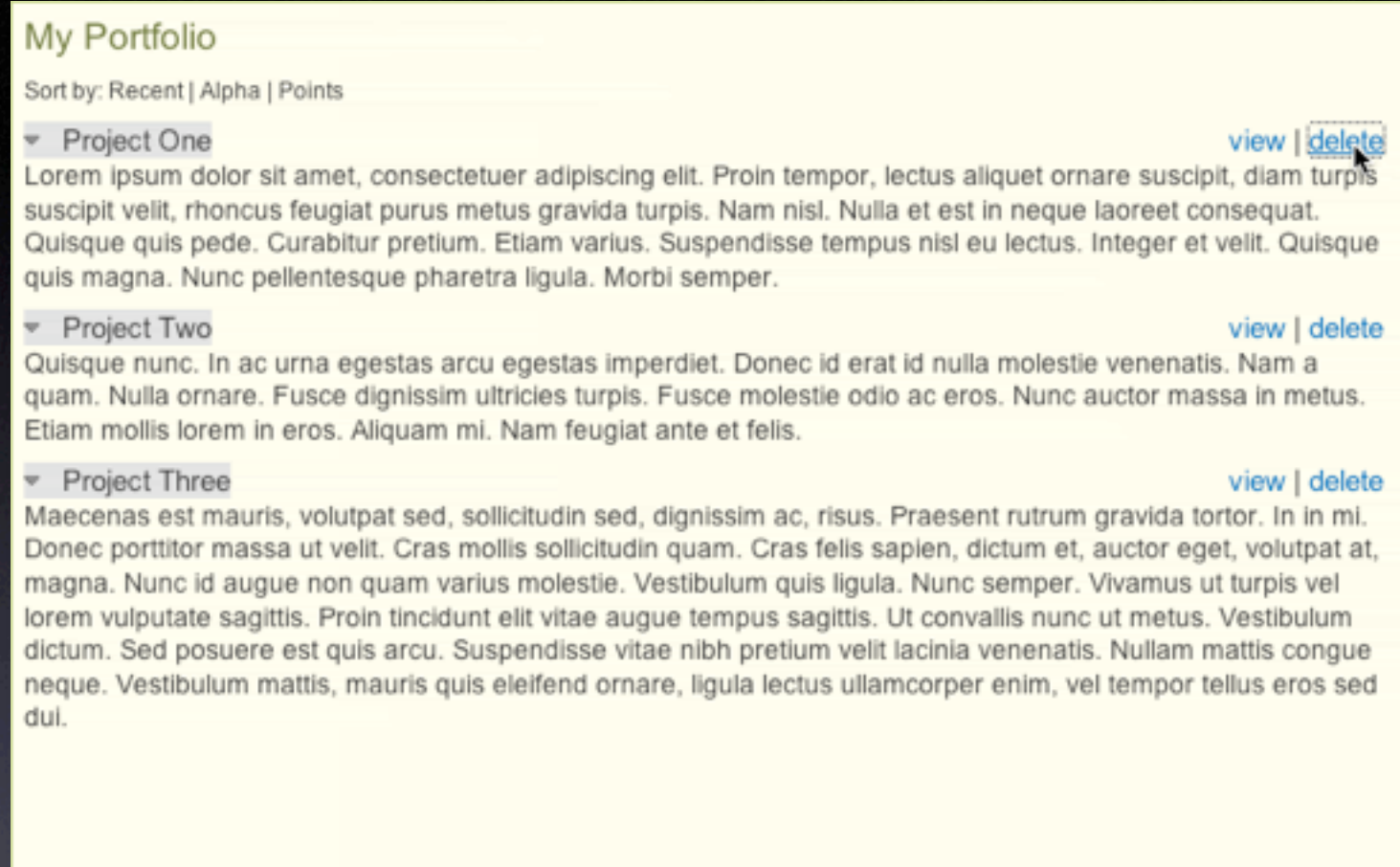
anatomy of an interaction

- Event
callback: interesting moments fired by a behavior
includes explicit triggers
- Behavior
interaction logic
- DOM element
interface entities



anatomy of self-healing delete

- Events
 - on trigger (click)
 - on fade complete
- Behaviors
 - Move
 - Fade
 - Close
- DOM elems
 - `<a>delete</a>`
 - `<div>lorem...</div>`

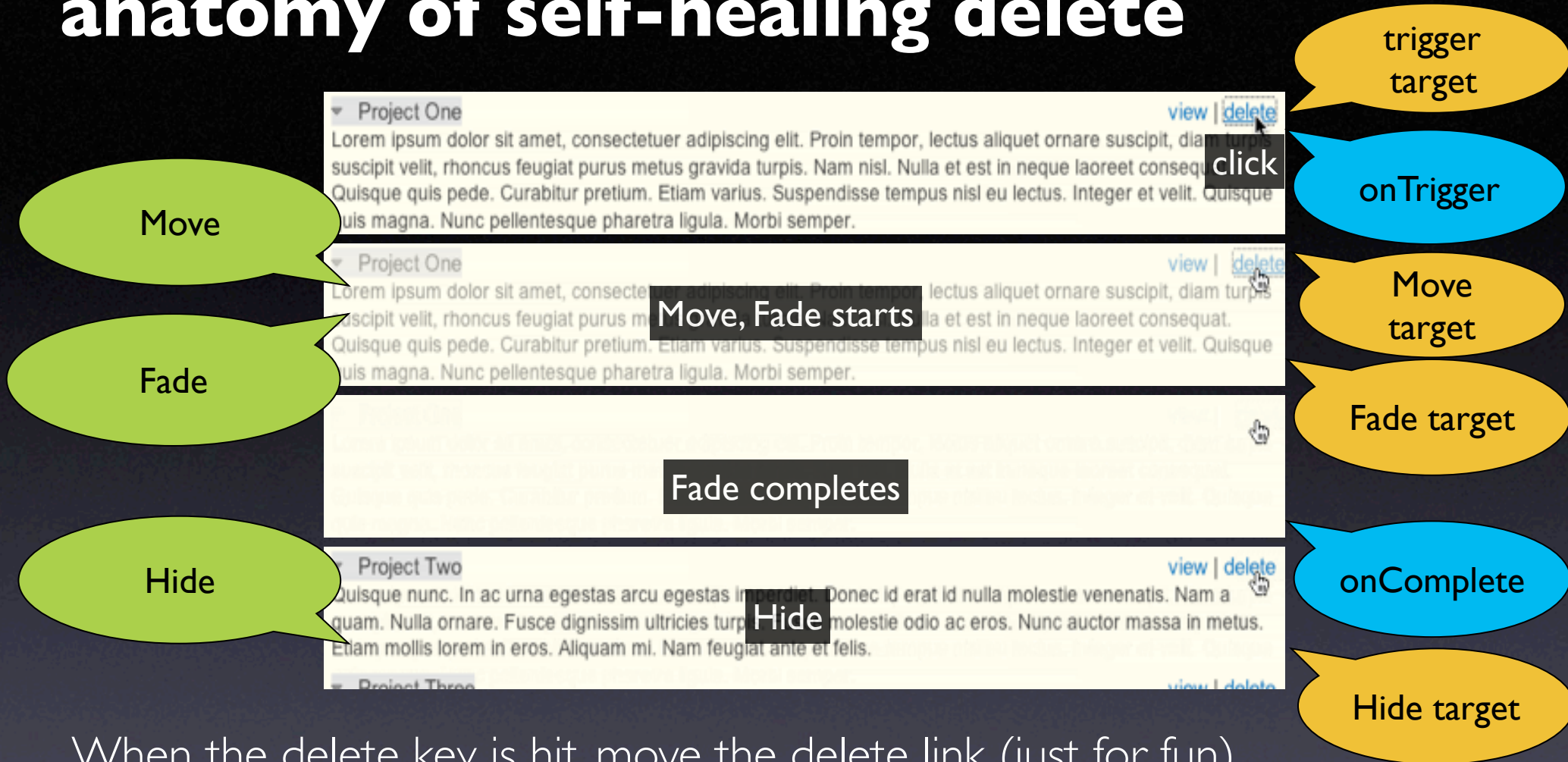


Event

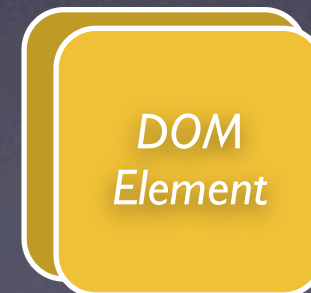
Behavior

DOM
Element

anatomy of self-healing delete



When the delete key is hit, move the delete link (just for fun), fade the summary. When the fade completes, hide the summary.



how this looks with protokit

▼ Project One

view | delete

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suscipit velit, rhoncus feugiat purus metus gravida turpis. Nam nisl. Nulla et est in neque laoree
Quisque quis pede. Curabitur pretium. Etiam varius. Suspendisse tempus nisl eu lectus. Integer
quis magna. Nunc pellentesque pharetra ligula. Morbi semper.

- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a',  
      Move: { points: { by: [10, 0] } },  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

how this reads:

For each DIV in the portfolio list,

Fade the DIV associated with the delete link

when the delete link is clicked

and at the same time move the delete link by 10 pixels

and after the Fade is complete, close the associated DIV

dom, behaviors, events

▼ Project One

[view](#) | [delete](#)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin tempor, lectus aliquet ornare suscipit, diam turpis suscipit velit, rhoncus feugiat purus metus gravida turpis. Nam nisl. Nulla et est in neque laoreet consequat. Quisque quis pede. Curabitur pretium. Etiam varius. Suspendisse tempus nisl eu lectus. Integer et velit. Quisque quis magna. Nunc pellentesque pharetra ligula. Morbi semper.

- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a:contains("delete")',  
      Move: { points: { by: [10, 0] } }  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

The diagram illustrates the protokit configuration for a 'div#portfolio-list > div' element. It features several callouts explaining parts of the configuration:

- Fade**: Points to the 'Fade' behavior object.
- Move**: Points to the 'Move' object within the 'onTrigger' configuration.
- Close**: Points to the 'Close' object within the 'onComplete' configuration.
- Behavior target**: Points to the 'target' property within the 'onTrigger' configuration.
- onTrigger**: Points to the 'onTrigger' configuration object.
- Trigger target**: Points to the 'target' property within the 'onTrigger' configuration.
- onComplete**: Points to the 'onComplete' configuration object.

dom elements as targets



▼ Project One

[view](#) | [delete](#)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin tempor, lectus aliquet ornare suscipit, diam turpis suscipit velit, rhoncus feugiat purus metus gravida turpis. Nam nisl. Nulla et est in neque laoreet consequat. Quisque quis pede. Curabitur pretium. Etiam varius. Suspendisse tempus nisl eu lectus. Integer et velit. Quisque magna. Nunc pellentesque pharetra ligula. Morbi semper.

- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a:contains',  
      Move: { points: { by: [10, 0] } }  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

Behavior
target

Trigger
target

dom elements via css
selector (jQuery)

2 targets:
behavior target &
trigger target.

multiple or single
items can be
operated on.

scope is passed
down, unless
overridden by
explicit target set

dom elements as targets



▼ Project One

[view](#) | [delete](#)

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- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a:contains(delete)',  
      Move: { points: { by: [10, 0] } }  
    },  
    onComplete: 'delete link is now Move's behavior target',  
    Close: { }  
  },  
  'div#portfolio-list h3 a:contains(delete)': {  
    type: 'click',  
    target: 'div#portfolio-list h3 a:contains(delete)',  
    Move: { points: { by: [10, 0] } }  
  }  
}
```

portfolio div is
in scope

portfolio div is still
in scope

delete link is now Move's
behavior target

delete link is target
for onTrigger

dom elements via css
selector (jQuery)

2 targets: behavior
target & trigger
target.

multiple or single
items can be
operated on.

scope is passed
down, unless
overridden by
explicit target set

dom css selector syntax



My Portfolio

Sort by: Recent | Alpha | Points

```
'div#portfolio-list h3 a:contains("delete")'
```

▼ Project Two

```
'div#portfolio-list > div'
```

[view](#) | [delete](#)

Quisque nunc. In id nulla egestas arcu. Egestas imperdiet. Donec id erat id nulla molestie venenatis. Nam a quam. Nulla ornare. Fusce dignissim ultricies turpis. Fusce molestie odio ac eros. Nunc auctor massa in metus. Etiam mollis lorem in eros. Aliquam mi. Nam feugiat ante et felis.

delete link

```
'div#portfolio-list h3 a:contains("delete") '
```

Project Heading and Project Summary

```
'div#portfolio-list > div'
```


css selector syntax/xpath



- protokit uses jQuery for its selection syntax
- this means all the standard css-3 & xpath selection supported by jQuery is part of protokit
- it also means that all selector plugins will work as well
- Full information can be found at:
- <http://docs.jquery.com/DOM/Traversing/Selectors>

behavior chaining & scoping



▼ Project One

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suscipit velit, rhoncus feugiat purus metus gravida turpis. Nam nisl. Nulla et est in neque laoree
Quisque quis pede. Curabitur pretium. Etiam varius. Suspendisse tempus nisl eu lectus. Integer
quis magna. Nunc pellentesque pharetra ligula. Morbi semper.

- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a',  
      Move: { points: { by: [10, 0] } },  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

Fade

Move

Close

behaviors contain
attributes
callbacks

nesting defines chaining

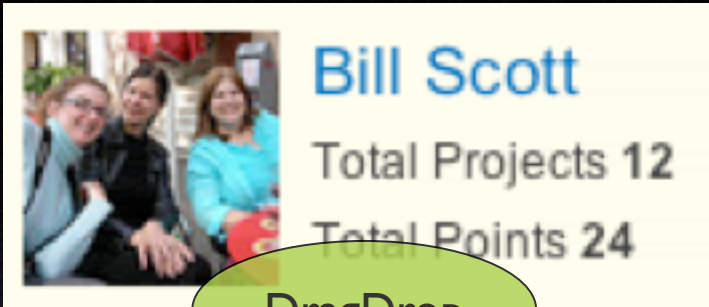
*Both Move & Close are
dependent on Fade.*

*Move will execute when the
fade is triggered.*

*Close will execute when the
fade is complete.*

*You can also create parallel
execution.*

chaining



```
DragDrop: {  
  ...  
  onDragDrop: {  
    InnerHtml: {  
      copyFrom: '$drag',  
      onTrigger: {  
        Fade: {  
          opacity: {to: 0.5},  
          duration: 0.1,  
          onComplete: {  
            Fade: {  
              opacity: {to: 1.0, duration: 0.1}  
            }  
          }  
        }  
      }  
    }  
  },  
  ...  
}
```

attributes



- Behaviors may supply attributes for configuring the behavior
- Where possible if an underlying YUI component or utility has a config object, this is exposed

EXAMPLE FROM Popup BEHAVIOR (bold denotes from Panel cfg)

```
close: true,  
draggable: true,  
underlay: 'shadow',  
model: false,  
visible: true,  
effect: null,  
monitorresize: true,  
x: null,  
y: null,  
xy: null,  
context: null,  
fixedcenter: true,
```

```
width: '300px',  
height: null,  
zIndex: null,  
constraintviewport: false,  
iframe: false,  
id: 'popup_panel',  
hd: 'Panel Title',  
bd: 'This is the body',  
ft: null
```


current behavior set



Resize. Animate. Spotlight. Fade. Move.
ToggleStyle. Style. ReplaceStyle. Show. Hide.
ToggleShowHide. Eval. Open. Close.
ToggleOpenClose. InnerHtml.
AjaxInnerHtml. Popup. DragDrop.

events: callbacks and onTrigger



▼ Project One

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- protokit configuration

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list',  
      Move: { points: { by: [10,  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

onTrigger **wires** the fade behavior to event and fires onTrigger event

onComplete **fired** by the Fade behavior

callback contains behaviors
causes other behaviors to start

e.g., Close will execute when the fade is complete.

onTrigger is special callback
any behavior can be **wired** to events, timers or state changes.
a) controls how a behavior gets invoked
b) fires a callback and invokes nested behaviors

You can also create parallel execution.

onTrigger



- onTrigger allows you to define an event that will trigger the behavior it is inside.
- onTrigger will fire a callback when the trigger happens
- onTrigger can be: immediate, event-based, timer-based or (in the future) state-based (e.g., dependent on value of another dom element)
- onTrigger can specify the element(s) to register the event with or what element it will look to for state change (future)
- onTrigger inherits it's target from the behavior if none is supplied
- onTrigger is immediate if type is not supplied or is set to immediate

behavior callbacks



- Each behavior defines it's own set of callbacks
- Must start with the prefix 'on'. Example: 'onComplete' -- but cannot use onTrigger.
- Most behaviors will have callbacks
 - e.g., DragDrop: onMouseDown, onStartDrag, onDrag, onDragEnter, onDragOver, onDragDrop, onDragOut, onEndDrag, onMouseUp
- You can create your own callbacks in your own behavior by through a utility function:
YAHOO.proto.Util.callDependentBehaviors()

EXAMPLE FROM DragDrop BEHAVIOR

```
dd.onDragOut = function(e, dropId) {  
    var dropTarget = YAHOO.util.Dom.get(dropId);  
    var draggedItem = this.getEl();  
  
    if(cfg.onDragOut) {  
        YAHOO.proto.Util.callDependentBehaviors(me, cfg.onDragOut,  
            dropTarget, triggerTarget);  
    }  
};
```


callbacks are interesting moments



Interesting Moments

Simply making an object draggable rarely suffices to achieve the desired interaction behavior for a drag-and-drop implementation. In most cases, Drag and Drop requires that you write code to respond to the interesting moments in the interaction: when the drag event starts, when the dragged object enters another object, and so on. The Drag and Drop Utility provides methods that fire during each of the interesting moments of the interaction. You customize your implementation by supplying the code for these methods (all of which are members of the `YAHOO.util.DD`, `YAHOO.util.DDProxy`, and `YAHOO.util.DDTarget`).

Moment	Description
onMouseDown	Provides access to the mousedown event. The mousedown does not always result in a drag operation.
startDrag	Occurs after a mouse down and the drag threshold has been met. The drag threshold default is either 3 pixels of mouse movement or 1 full second of holding the mousedown.
onDrag	Occurs every mousemove event while dragging.
onDragEnter	Occurs when the dragged object first interacts with another targettable drag and drop object.
onDragOver	Fires every mousemove event while over a drag and drop object.
onDragOut	Fires when a dragged object is no longer over an object that had the onDragEnter fire.
onDragDrop	Fires when the dragged objects is dropped on another.
onInvalidDrop	Fires when the dragged objects is dropped in a location that contains no drop targets.
endDrag	Fires on the mouseup event after a drag has been initiated (startDrag fired).
onMouseUp	Fires on the mouseup event whether or not a drag was initiated.

protokit syntax

```
CSS_SELECTOR: {  
  BEHAVIOR: {  
    ATTRIBUTE: VALUE,  
    onTrigger: {  
      type: EVENT,  
      target: CSS_SELECTOR,  
      BEHAVIOR: { ATTRIBUTE_LIST }  
    },  
    CALLBACK: {  
      BEHAVIOR: { }  
    }  
  }  
}
```

CSS_SELECTOR

String denoting CSS query (jQuery)

Contains:

BEHAVIORS

BEHAVIOR contains

By convention camel case spelling

Contains:

ATTRIBUTES (optional)

onTrigger (optional)

BEHAVIOR (optional)

EVENT_STATE (optional)

ATTRIBUTE

Configuration attributes for behavior

Contains

name, value pair

onTrigger

Configures a listener for event

Contains:

type: string denoting JS event

target: css selector for event target

CALLBACK

By convention prefix with 'on'

Contains:

attribute: value

protokit syntax

```
'div#portfolio-list > div': {  
  Fade: {  
    duration: 1,  
    onTrigger: {  
      type: 'click',  
      target: 'div#portfolio-list h3 a:contains("delete")',  
      Move: { points: { by: [10, 0] } }  
    },  
    onComplete: {  
      Close: { }  
    }  
  }  
}
```

Reads like this:

For each of the project summaries, fade out the summary when the user clicks on the delete link. When the delete link is clicked, move the like to the right by 10 pixels. When the fade completes, close the project summary.

Notice there are 2 targets. The BEHAVIOR TARGET (div with summary) and TRIGGER TARGET (delete link)

anatomy of a drag/drop

```
'#scratchpad-list img': {
  DragDrop: {
    dropTarget: '#idcard-mini div.icon, h2:contains(My Portfolio)',
    onDragOver: {
      ReplaceStyle: {
        removeClass: 'not-dragged-over',
        addClass: 'dragged-over'
      }
    },
    onDragOut: {
      ReplaceStyle: {
        removeClass: 'dragged-over',
        addClass: 'not-dragged-over'
      }
    },
    onDragDrop: {
      InnerHtml: {
        copyFrom: '$drag',
        onTrigger: {
          Fade: {
            opacity: {from:0.0, to: 1.0},
            duration: 0.25
          }
        }
      },
      ReplaceStyle: {
        removeClass: 'dragged-over',
        addClass: 'not-dragged-over'
      }
    }
  }
},
```

Reads like this:

Make all images in scratchpad draggable.

On drag over, change style to reflect hover. On drag out, restore style.

On drop (on valid target) copy the drag item's HTML into the id photo area, then fade the dropped item from 0 to 100%

drag/drop in action

'#idcard-mini div.icon, h2:contains(My Portfolio)'



Bill Scott
Total Projects **12**
Total Points **24**

My Portfolio

Sort by: Recent | Alpha | Points

▼ Project One

view | delete

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin tempor, lectus aliquet ornare suscipit, diam turpis suscipit velit, rhoncus feugiat purus metus gravida turpis. Nam nisl. Nulla et est in neque laoreet consequat. Quisque quis pede. Curabitur pretium. Etiam varius. Suspendisse tempus nisl eu lectus. Integer et velit. Quisque quis magna. Nunc pellentesque pharetra ligula. Morbi semper.

▼ Project Two

view | delete

Quisque nunc. In ac urna egestas arcu egestas imperdiet. Donec id erat id nulla molestie venenatis. Nam a

Scratchpad



'#scratchpad-list img'

```
onDragOver: {
  ReplaceStyle: {
    removeClass: 'not-dragged-over',
    addClass: 'dragged-over'
  }
},
onDragOut: {
  ReplaceStyle: {
    removeClass: 'dragged-over',
    addClass: 'not-dragged-over'
  }
},
```

```
onDragDrop: {
  InnerHtml: {
    copyFrom: '$drag',
    onTrigger: {
      Fade: {
        opacity: {from:0.0, to: 1.0},
        duration: 0.25
      }
    }
  },
  ReplaceStyle: {
    removeClass: 'dragged-over',
    addClass: 'not-dragged-over'
  }
}
```

anatomy of a toggle open/close

```
'div#portfolio-list h3 + div': {  
  ToggleOpenClose: {  
    onTrigger: {  
      target: 'div#portfolio-list h3>span:first-child', // when proj title is clicked  
      type: 'click',  
      ToggleStyle: {  
        styleClass: 'closed-title',  
        otherStyleClass: 'opened-title'  
      }  
    }  
  }  
}
```

Reads like this:

For all DIVs after an H3 inside the portfolio list (project body), toggle it between open & closed when user clicks on the first span in the title (title area). Also toggle the style class for the title between opened-title and closed-title (switches the arrow opened & closed)

Two behaviors: ToggleOpenClose & ToggleStyle

toggle show/hide in action

My Portfolio

Sort by: Recent | Alpha | Points

- ▼ Project One

`'div#portfolio-list h3>span:first-child',`

[view](#) | [delete](#)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin tempor, lectus aliquet ornare suscipit, diam turpis suscipit velit, rhoncus feugiat pulvis metus oravida turpis. Nam nisl. Nulla et est in neque laoreet consequat. Quisque quis pede. Curabitur praesentiam varius. Suspendisse tempus nisl eu lectus. Integer et velit. Quisque quis magna. Nunc pellentesque pharetra ligula. Morbi semper.
- ▼ Project Two

`'div#portfolio-list h3>span:first-child',`

[view](#) | [delete](#)

Quisque nunc. In ac urna egestas arcu egestas imperdiet. Donec id erat id nulla molestie venenatis. Nam a quam. Nulla ornare. Fusce dignissim ultricies turpis. Fusce molestie odio ac eros. Nunc auctor massa in metus. Etiam mollis lorem in eros. Aliquam mi. Nam feugiat ante et felis.

```
'div#portfolio-list h3 + div': {
  ToggleOpenClose: {
    onTrigger: {
      target: 'div#portfolio-list h3>span:first-child', // when proj title is clicked
      type: 'click',
      ToggleStyle: {
        styleClass: 'closed-title',
        otherStyleClass: 'opened-title'
      }
    }
  }
}
```

behavior attributes: **Popup example**

```
'div#portfolio-list': {  
  // popup a view of the contents  
  Popup: {  
    width: '510px',  
    fixedcenter: false,  
    context: ['div#portfolio-list h3 a:contains("view")', 'tr', 'td'],  
    effect: {effect:YAHOO.widget.ContainerEffect.FADE, duration: 0.2},  
    hd: 'Project Summary',  
    bd: 'div#portfolio-list h3 + div',  
    onTrigger : {  
      type: 'click',  
      target: 'div#portfolio-list h3 a:contains("view")'  
    }  
  }  
}
```


creating your own behaviors

- Name your class `YAHOO.proto.YourNewBehavior`
 - Where `YourNewBehavior` is spelled using CamelCase notation.
- Store the name & parent passed to the constructor
 - `name`
 - `parent`
- Implement an 'action' method
 - The action performs the behavior
 - `action()` receives the following parameters:
 - `cfg`: configuration attributes specified for the behavior
 - `behaviorTarget`: the element to apply the behavior to
 - `triggerTarget`: the source of the event if triggered by event
 - `idx`: if multiple elements are associated with this behavior, `idx` is the index into the jQuery elements.
- For any interesting moments, call
 - `YAHOO.proto.Util.callDependentBehaviors()` to process the moment's configuration

protokit behavior: **AjaxInnerHtml**

```
YAHOO.proto.AjaxInnerHtml = function (parentBeh, behName) {
    this.init(parentBeh, behName);
};

YAHOO.proto.AjaxInnerHtml.prototype = {
    // your config attributes go here
    defaultCfg : {
        url: null
    },

    // required to store parent & name
    init: function(parentBeh, behName) {
        this.parent = parentBeh;
        this.name = behName;
    },

    // Invoked when the behavior gets fired (via onTrigger or behavior specific callback)
    action: function(cfg, behaviorTarget, triggerTarget) {
        cfg = YAHOO.proto.Util.applyConfig(this.defaultCfg, cfg);
        if(!this.ajax)
            this.ajax = new YAHOO.proto.Ajax();

        this.ajax.get(cfg.url, null,
            function(req) {
                YAHOO.util.Dom.get(behaviorTarget).innerHTML = req.responseText;
            });
    }
};
```

protokit behavior: **ToggleOpenClose**

```
YAHOO.proto.ToggleOpenClose = function (parentBeh, behName) {
    this.init(parentBeh, behName);
};
YAHOO.proto.ToggleOpenClose.prototype = {

    defaultCfg : {
    },

    init: function(parentBeh, behName) {
        this.parent = parentBeh;
        this.name = behName;
    },

    action: function(cfg, behaviorTarget, triggerTarget) {

        cfg = YAHOO.proto.Util.applyConfig(this.defaultCfg, cfg);
        var currState = YAHOO.util.Dom.getStyle(behaviorTarget, "display");

        // CLOSE IT
        if(currState.toLowerCase() == "block") {
            YAHOO.util.Dom.setStyle(behaviorTarget, "display", "none");

            // OPEN IT
        } else {
            YAHOO.util.Dom.setStyle(behaviorTarget, "display", "block");
        }
    }
};
```


adding protokit to your page

```
<script type="text/javascript"
  src="http://yui.yahooapis.com/2.2.2/build/yahoo-dom-event/yahoo-dom-event.js"></script>
<script type="text/javascript"
  src="http://yui.yahooapis.com/2.2.2/build/utilities/utilities.js"></script>
<script type="text/javascript"
  src="http://yui.yahooapis.com/2.2.2/build/container/container-min.js"></script>
<script type="text/javascript" src="scripts/jquery-1.1.3.1.js"></script>
<script type="text/javascript" src="scripts/proto.js"></script>
```

```
<script>
YAHOO.util.Event.onDOMReady( function() {

$proto('div#portfolio-list h3 + div', {
  ToggleOpenClose: {
    onTrigger: {
      target: 'div#portfolio-list h3>span:first-child',
      type: 'click',
      ToggleStyle: {
        styleClass: 'closed-title',
        otherStyleClass: 'opened-title'
      }
    }
  }
});

});
</script>
```

configuring a page for interaction

\$proto(selector, interaction)

where:

selector is the jQuery selector syntax

interaction is a configuration object (JSON) describing the interaction

```
$proto( 'div#portfolio-list h3 + div', {  
  ToggleOpenClose: {  
    onTrigger: {  
      target: 'div#portfolio-list h3>span:first-child',  
      type: 'click',  
      ToggleStyle: {  
        styleClass: 'closed-title',  
        otherStyleClass: 'opened-title'  
      }  
    }  
  }  
  } // you can add more behaviors here (separated by comma)  
});
```


configuring a page for interaction

\$proto(**config**)

where:

config defines a set of selectors with a set of behaviors

```
$proto( {  
  'div#portfolio-list h3 + div': {  
    ToggleOpenClose: {  
      onTrigger: {  
        target: 'div#portfolio-list h3>span:first-child',  
        type: 'click',  
        ToggleStyle: {  
          styleClass: 'closed-title',  
          otherStyleClass: 'opened-title'  
        }  
      }  
    }  
  } // you can add more behaviors here (separated by comma)  
} // you can add more selectors here (separated by comma)  
});
```

configuring a page for interaction

\$proto(**config**)

config defines a set of selectors with a set of behaviors

```
var config = {  
  'div#portfolio-list h3 + div': {  
    ToggleOpenClose: {  
      onTrigger: {  
        target: 'div#portfolio-list h3>span:first-child',  
        type: 'click',  
        ToggleStyle: {  
          styleClass: 'closed-title',  
          otherStyleClass: 'opened-title'  
        }  
      }  
    }  
  } // you can add more behaviors here (separated by comma)  
} // you can add more selectors here (separated by comma)
```

\$proto(**config**);

configuring a page for interaction

```
var config = {
  'div#portfolio-list h3 + div': {
    ToggleOpenClose: {
      onTrigger: {
        target: 'div#portfolio-list h3>span:first-child',
        type: 'click',
        ToggleStyle: {
          styleClass: 'closed-title',
          otherStyleClass: 'opened-title'
        }
      }
    }
  },
  'div#portfolio-list > div': {
    Fade: {
      onTrigger: {
        type: 'click',
        target: 'div#portfolio-list h3 a:contains("delete")',
        Move: { points: { by: [10, 0] } }
      },
      duration: 1,
      onComplete: {
        Close: {}
      }
    }
  }
};

$proto(config);
```

status

- Very early stage
 - Just started writing protokit last week!
 - Have about 20 behaviors
- Will release 0.1 candidate release in a couple weeks
 - Will include full documentation and cheatsheets for all behaviors and the configuration syntax
 - Examples of most common tasks
 - Look for announcement on <http://looksgoodworkswell.com>

future direction

- Release GUI tool that will allow you to drag drop behaviors onto page elements on any web site
- Investigate a jQuery plugin wrapper to allow the library of extensions to be opened up to protokit
- Add support for dependent state triggers between dom elements (trigger will support expression testing)
- Extend selector syntax to include XPath, URL fetching, image fetching

other useful approaches

- Responder
 - <http://www.boxpop.net/responder>
 - given a style class name, associate behavior with those objects
- jQuery
- LivePipe's Event.Behavior
 - http://livepipe.net/projects/event_behavior/
- Dustin Diaz, DED Chain
 - <http://dedchain.dustindiaz.com/>

other useful approaches

- Transclusions
 - including html from somewhere else on your page
 - <http://ajaxian.com/archives/purple-include-transclusions-you-know-you-want-them>
- DOMDom
 - nice way to express HTML for Dom insertion
 - <http://www.zachleat.com/web/2007/07/07/domdom-easy-dom-element-creation/>
 - (merge with protokit)
- Magic DOM
 - <http://amix.dk/blog/viewEntry/19199>
- Jester: JavaScriptian REST
 - <http://giantrobots.thoughtbot.com/2007/4/2/jester-javascriptian-rest>
- JavaScript Templating Library: MJT
 - <http://mjtemplate.org/>

other useful approaches

- moz-behaviors (dean.edwards.name)
 - <http://dean.edwards.name/moz-behaviors/intro/>
 - uses CSS Linking mechanisms
 - <http://www.w3.org/TR/becss>
- ClassAnim
 - <http://blog.mozmonkey.com/2007/classanim-hoverhijax-keeping-presentation-out-of-your-javascript/>
- JDA Emulator: Spring for JS
 - Adds properties to the HTML tags themselves
- Ben Nolan's Behavior Library
 - <http://www.ccs.neu.edu/home/dherman/javascript/behavior/>
 - <http://www.ccs.neu.edu/home/dherman/javascript/behavior/example.html>
 - Ben Nolan, Dave Herman, Simon Wilison
- Prototype Behavior Library (built on prototype.js)

more resources

Articles

Web 3.0 article: www.alistapart.com/articles/web3point0/

looksgoodworkswell.blogspot.com/2005/11/visio-wireframe-toolkit-for-download.html

looksgoodworkswell.blogspot.com/2005/11/animating-interactions-with-photoshop.html

Prototyping with PowerPoint: blogs.msdn.com/jensenh/archive/2006/02/20/535444.aspx

Visio - the interaction designer's nail gun: http://www.guuui.com/issues/01_06.php

PDF Prototyping: http://www.gotomedia.com/gotoreport/may2005/news_0505_usable1.html

Products

www.axure.com/demo.aspx

iRise Application Simulator: irise.com

Visio Stencils

www.bboxesandarrows.com/view/storyboarding_rich_internet_applications_with_visio

Visio Stencil Library: swipr.com

Wireframe Stencils: <http://iainstitute.org/tools/>

Garrett Dimon's Stencils: <http://www.garrettdimon.com/resources/templates-stencils-for-visio-omnigraffle>

questions?