Ajax
The Big Picture

Andre Charland

CEO and Co-Founder Nitobi

About Me

- Andre Charland
- Nitobi -Founder, President
- Author of Enterprise AJAX for Prentice Hall
- AJAX Experts
- 10 Employees
- Founded in Vancouver, 1998
- 100s of AJAX Customers

VOICES THAT MATTER CONFERENCE

GOOGLE WEB TOOLKIT

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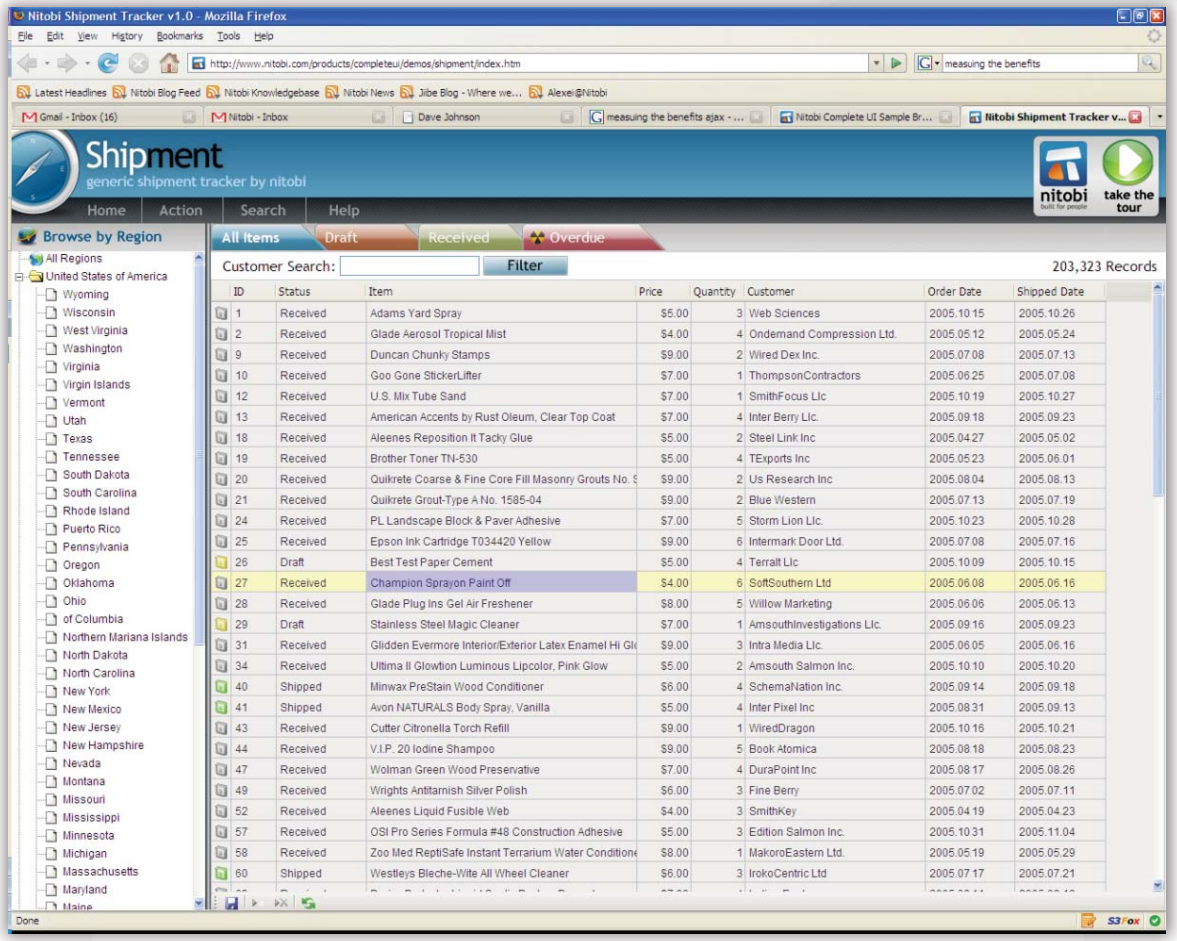
- Ajax User Interface Component suite (9)
- Cross platform
  - Java
  - ASP.NET/ASP
  - PHP
  - Coldfusion



- Enterprise Web Systems Development
  - UI Visioning and development
  - Intranets
  - 'In the field' web systems

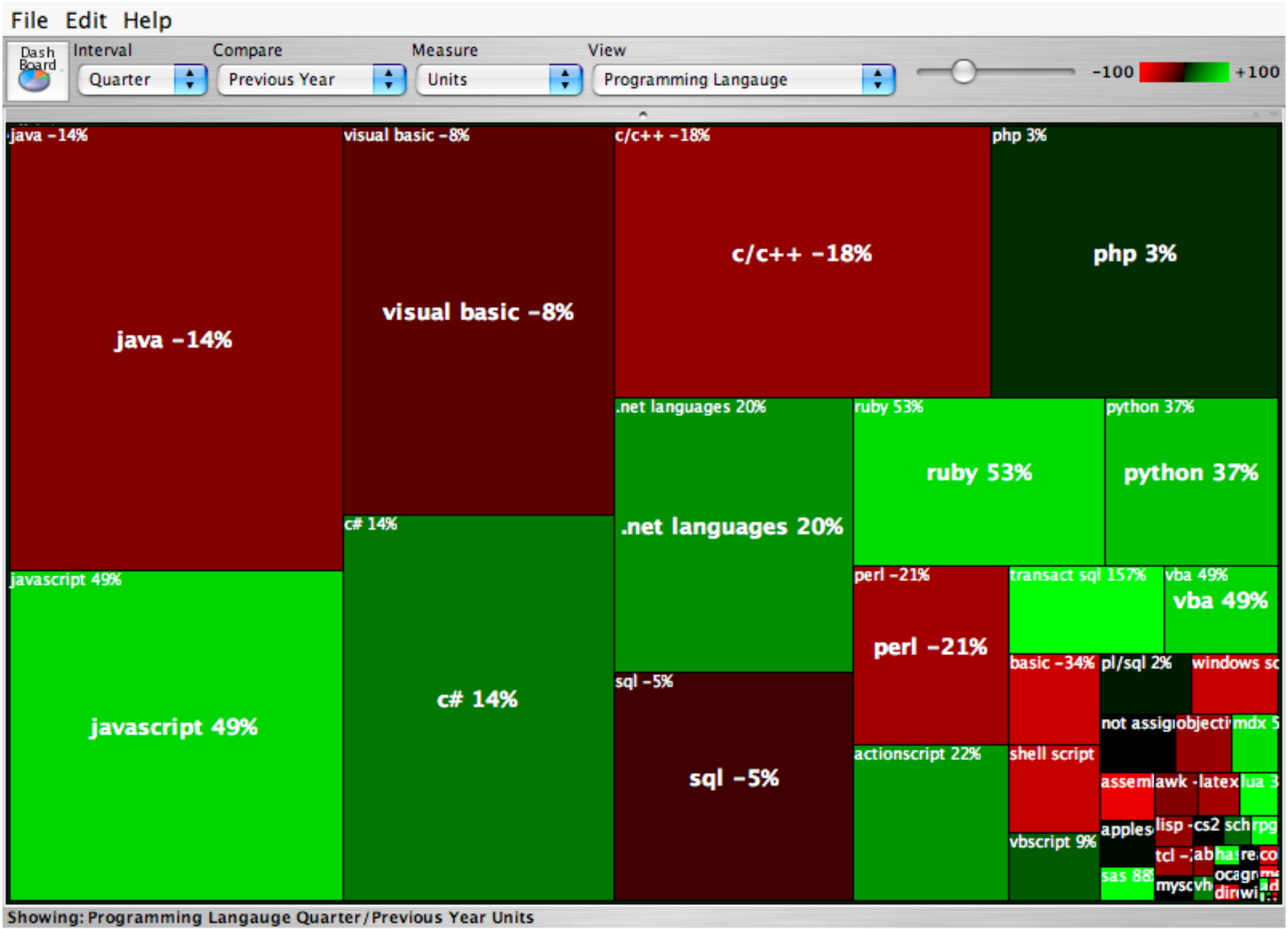
- Consumer Web Systems Development
  - Web strategy
  - Application development

Rich Internet Applications

- AJAX
- Java
  - WebStart
  - Applets
  - JavaFX
- Flash
- Flex
- Silverlight / WPF
- Adobe Integrated Runtime (AIR)

AJAX Frameworks

- PHPLiveX
- Picora
- Qcodo
- sniPEAR
- Symfony
- PAJAX
- PAJAJ
- Tigermouse
- XOAD
- Zephyr
- ADF
- ADL
- IWF
- Zimbra AjaxTk
- JuiseLib
- AjaxCaller
- AjaxGears
- AjaxToolbox
- AJFORM
- Jx/jxs
- Gaia
- Ajax.NET
- Ajaxium
- Anthem.NET
- AjaxAspects
- Bitkraft
- ComfortASP.NET
- emergetk
- FastPage
- MagicAjax.NET
- mxAjax
- Restlet
- SWATO
- Tacos
- Telosys
- ThinkCAP JX
- Wicket
- WidgetServer
- Wonder
- XANDRA
- xWire
- ZK
- Lokris
- MAJAX
- RSLite
- Sack
- UniAjax
- XHConn
- Google Web Toolkit
- Mochikit
- Yahoo User Interface Library
- Rialto-supported
- Sarissa
- SAJAX
- jQuery
- XAJAX
- Rialto
- Telerik
- Infragistics
- IceSoft
- ActiveWidgets
- Dart
- Cajax
- Claw
- FURIA
- Guava
- HTS
- jPOP
- JPSpan
- My-BIC
- Kumbia
- NanoAjax
- Noculo
- PHPLiveX
- Picora
- Qcodo
- sniPEAR
- Symfony
- PAJAX
- PAJAJ
- Tigermouse
- XOAD
- Dojo
- Adobe Spry
- Script.aculo.us
- Rico
- Prototype
- ASP.NET Ajax (Atlas)
- Moo.fx
- CakePHP
- AjaxTags
- Django
- Nitobi
- Backbase
- TIBCO
- Nexaweb
- Laszlo
- Cerny
- Direct Web Remoting (DWR)
- EXT
- JackBe
- Javeline
- JsLINB
- JsRia
- Macao
- OpenLink
- Plex Toolkit
- Qooxdoo
- SmartClient
- Subsys_JsHttpRequest
- ThyAPI
- TIBET
- twoBirds
- Ajax Client Engine
- Ajax Queue Class
- Lumberjack
- JSLog
- jsTracer
- CAPXOUS
- AjaxCFC
- JSMX
- WDDXAJ
- Akelos
- AModule
- AJASON
- aSSL
- AjaxAC
- Ajax Age
- MOJO
- Zapate
- Comp
- he
- Farpoi
- DevEx
- Janus


File Edit Help
Dash Board
Interval
Quarter
Compare
Previous Year
Measure
Units
View
Programming Langauge
-100
+100
java -14%
visual basic -8%
c/c++ -18%
php 3%
.net languages 20%
ruby 53%
python 37%
c# 14%
perl -21%
transact sql 157%
vba 49%
javascript 49%
basic -34%
pl/sql 2%
windows sc
sql -5%
not assigi
objecti
mdx 5
actionscript 22%
shell script
assem
awk
latex
lua 3
apples
lisp
cs2
sch
rpg
vbscript 9%
tcl
ab
sas 88
mysc
vh
Showing: Programming Langauge Quarter/Previous Year Units

Users First

- Nothing else matters
- The interface is the application

Usability

"Usability is a term used to denote the ease with which people can employ a particular tool or other human-made object in order to achieve a particular goal"

- Helping users achieve their goals
- With great power comes great responsibility
- Helping users kick ass!

Factors

- Learnability
- Memorability
- Effectiveness
- Efficiency
- Satisfaction ;-)

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Benefits

- Higher rates of task success
- Happier users
- More efficient users
- Saving time for users
- ROI

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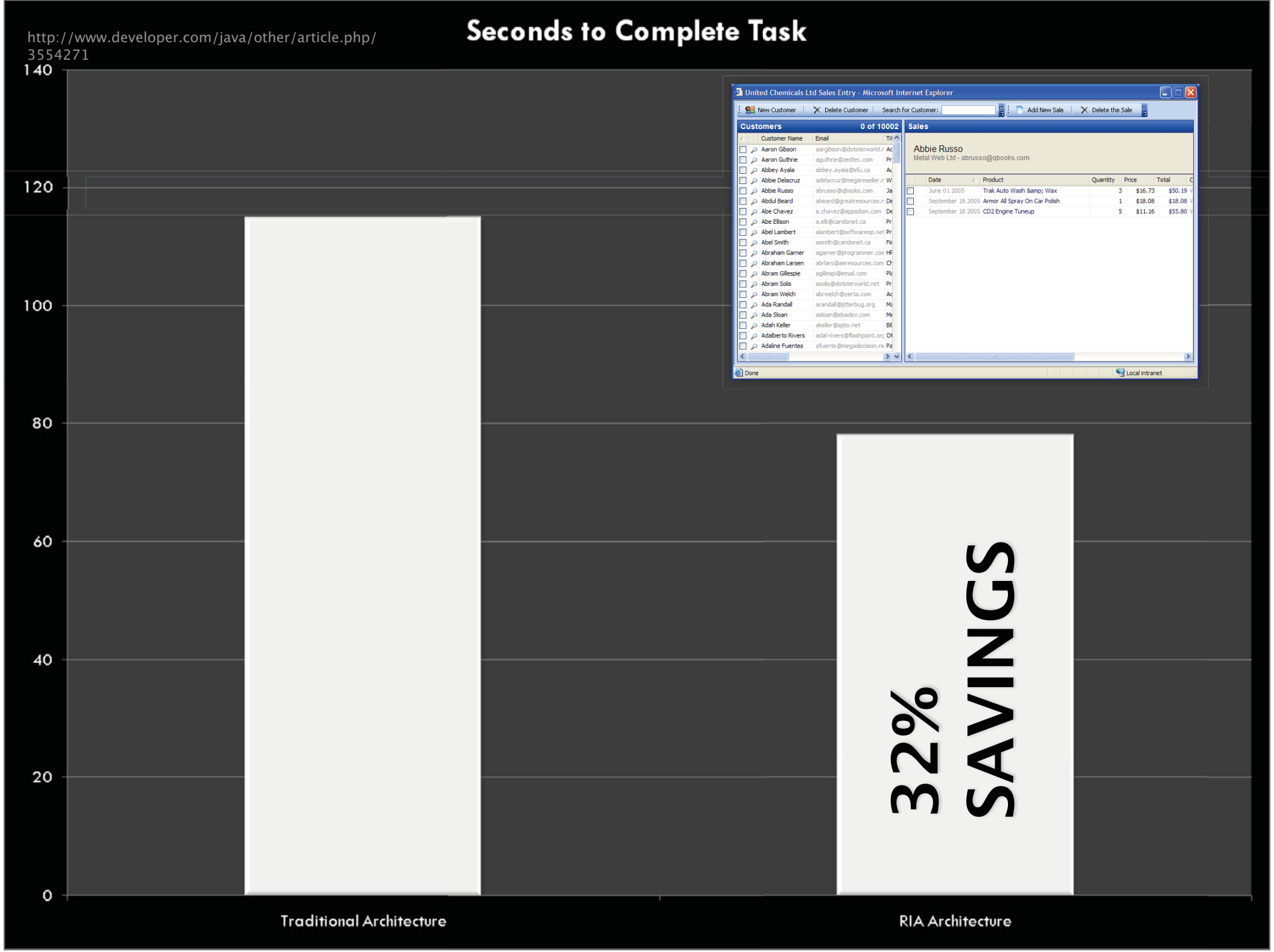
Why RIA?

- User Retention
- Brand Development
- User Efficiency
  - Steps to complete a task
  - Training costs
  - Uninterrupted workflow
  - Time spent waiting*

http://www.developer.com/java/other/article.php/3554271

Seconds to Complete Task



Financial ROI

Hourly (Loaded)
Labor Rate
X
Time Saved per Transaction
X
Number of Transactions per year

Run the numbers...

Assumptions:

Hourly Labor Rate: $20

Seconds Saved per Transaction: 36 Seconds

Number of Transactions per year: 50,000

Savings:

$10,000

500 Person Hours

Usability Testing

- Doesn't have to expensive
- Has to be done
- What to test:
  - Time for task completion
  - Accuracy (# of mistakes
  - Recall
  - User satisfaction

Usability Testing: How to do it

- Recruit users
- Design scenarios
- Participant Narration
- No egos
- Record the session
- Test small, test often

Usability Testing Resources

- User Interface Engineering by Jakob Nielsen
- Ethnio - remote testing services
- Usability.gov

Usability Data

- Microsoft designed the new office UI, the ribbon, based on lots of data
- 1.2 billion data sessions collected
- ~1.8 million sessions per day
- In 90 days, they tracked 352 million command bar clicks in Word
- Tracked 6000 individual datapoints

Analysis Tools

- RobotReplay
- Adobe Connect
- Google Analytics (Events)

Google Analytics Demo

RobotReplay Demo

Connect Demo

Ajax Pitfalls

- Back Button
- Bookmarking
- Confusion
- Performance

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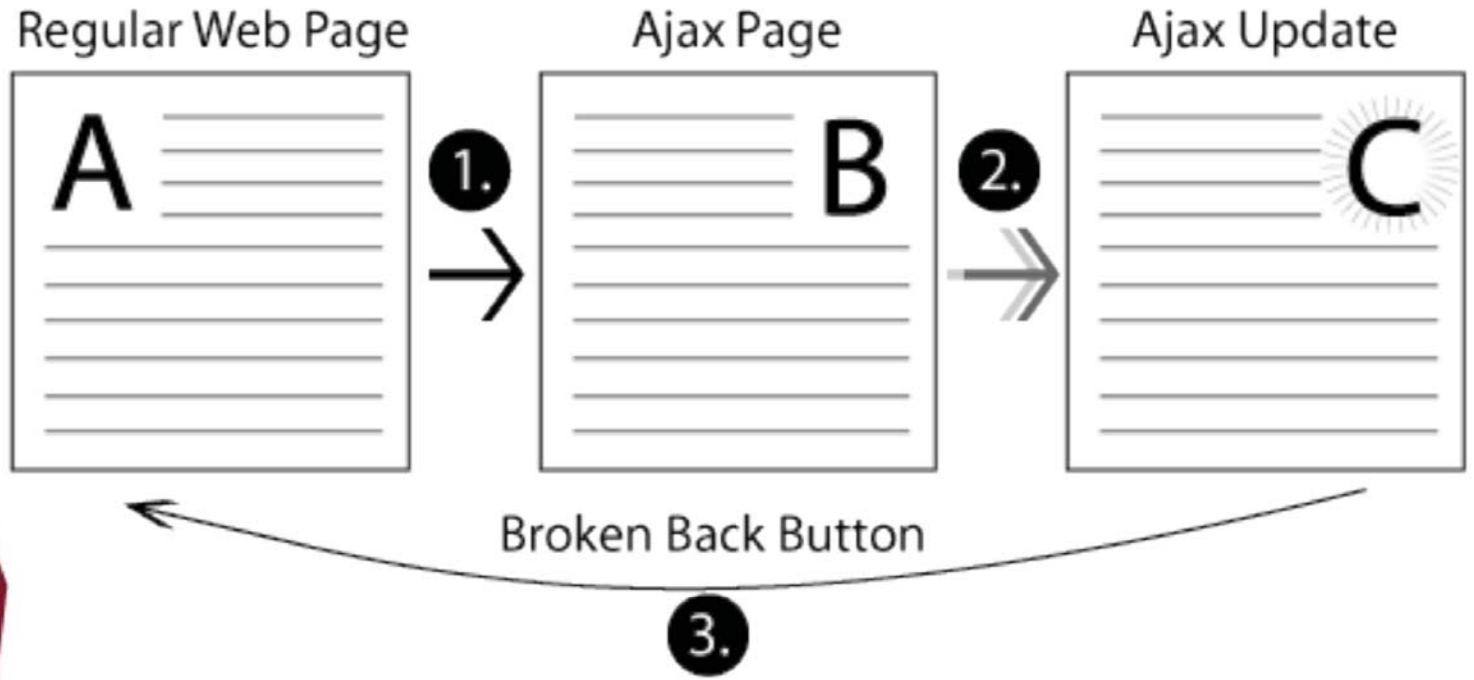
Broken Back Button



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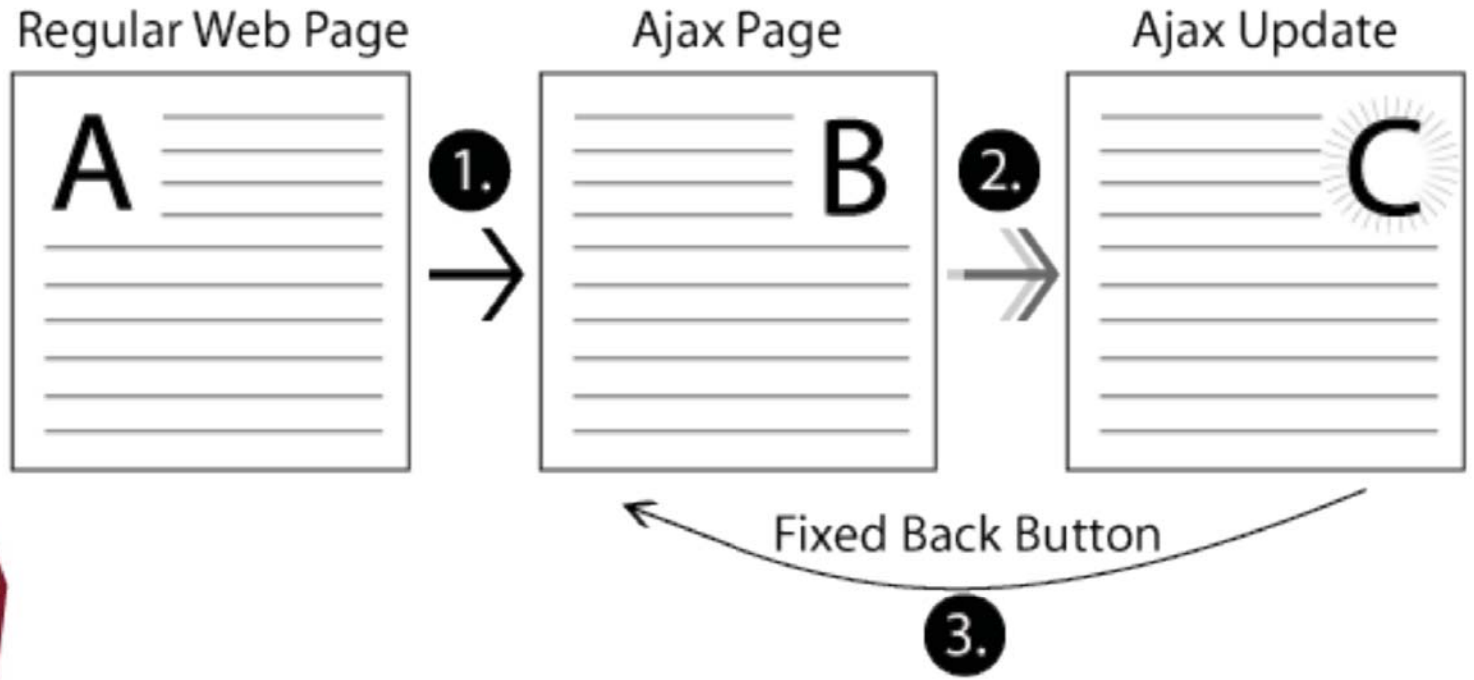
What Users Expect



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Fix

- #
- Build a state record
- GWT

Performance

- Perceived vs Real
- User perceptions are more important
  - Task complexity
  - Jitter (variability of latency)
  - Wait time

Page Weight

- For Example
  - HTML size—10 KB
  - JavaScript attachments— 45 KB
  - Size of all images—25 KB
  - Total Page Weight—80 KB
- Average download time
  - with 56-K modem: 13.3 seconds (6 KB per second)
  - With DSL connection: 2.67 seconds (30 KB per second)

Wait Time Guidelines

- <1 Second - Don't worry
- 1-10 Seconds Activity indicator
- >10 Seconds - Progress Bar

- Favor Usability over Page Weight

Technical Performance Tips

- Take advantage of Caching
- Reduce File Count
- Optimize JavaScript
- gZIP JavaScript and CSS
- More resources
  - Y Slow
  - High Performance Websites

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Inspect | Performance | Stats | Components | Tools | Help

Console | HTML | CSS | Script | DOM | Net | YSlow | Options

Performance Grade: A (92) Expand All Collapse All

C	1. Make fewer HTTP requests This page has 6 external JavaScript files. This page has 11 CSS background images.
A	2. Use a CDN
B	3. Add an Expires header
A	4. Gzip components
B	5. Put CSS at the top
A	6. Move scripts to the bottom
A	7. Avoid CSS expressions
n/a	8. Make JS and CSS external
B	9. Reduce DNS lookups
A	10. Minify JS
A	11. Avoid redirects
B	12. Remove duplicate scripts
A	13. Configure ETags

Done A 189.7K 1.594s

Accessibility

- You can't have usability without it
- Helping impaired users
- Not just blind (more vocal)

Automation

- Generally doesn't work with Ajax
- Wrong assumptions
- Dynamic and changing pages

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Accessibility Barriers

Sight	Keyboard & Mouse
Hearing	Text Only
Movement	Connection
Information	Language
Reading	Distractions
Comprehension	Browser

Challenges

- W3C says should work without without JS
- Focus is on screen readers
  - Jaws
- Graceful degradation doesn't cut it
- Come back with reader X doesn't cut it

Screenreaders: Jaws

- Jaws is the primary screen reader on the market
- Based on IE
- Alternatives: Windows Eyes, Hal, Home Page Reader

How Jaws Works

- Virtual Buffer
- Snapshot of DOM
- 2 Modes
  - "Virtual PC Cursor Mode" is standard
  - "PC Cursor Mode" is needed for Ajax
- Older versions IE only
- Jaws 7.0 works with FireFox

Keyboard Accessibility

- Minimize swapping between input devices
- Keyboard Accessibility for everybody
- Conform to accepted standards
  - MS Windows UE Guidelines (http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnwue/html/ch08c.asp)
- Test with MS Object Inspector

Tree Guidelines

- Use Arrow Keys
- Up and Down move between items
- Left and right move along a branch
- Right arrow can expand a branch
- Left arrow collapses or moves to parent
- Enter selects the contents of a node

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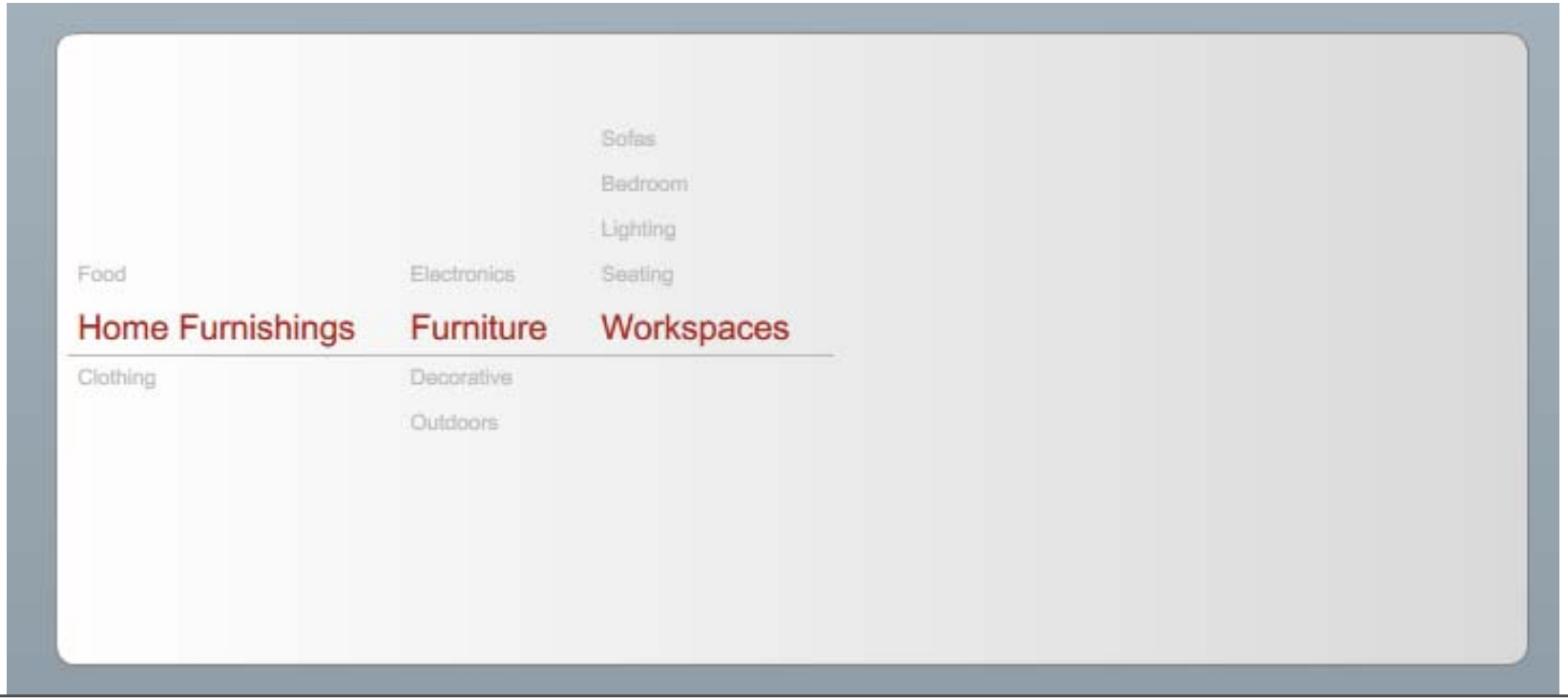
Random Walk Example

- Ely Greenfield's sample



Jaws Protected Strokes

- Ctrl: stops the reader
- Ctrl + Home: restart reading from the top
- Down Arrow: read the next line
- Enter: Activates a link or button

Use Common Sense

- Don't barry popular options in tabs
- Use tab order with `tabindex`
- Copy popular desktop and web apps
  - i.e. Outlook, Gmail, etc..

Break

Design and Patterns

Design Techniques

- User interface patterns
- Mock Ups
- Paper Prototypes
- Keep it simple
- Familiar vs. intuitive

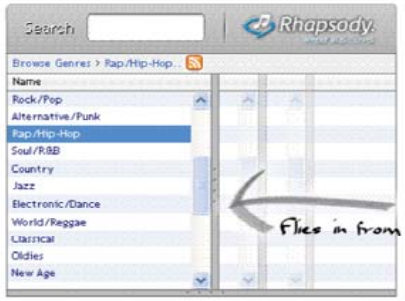
Tools

- Tools and techniques for rapid prototyping
  - Storyboard
  - Wire frames
  - Visio
  - Power Point
  - Photoshop
  - Flash/Flex
  - Axure
  - ProtoScript

Figure 1 - Expanded mode, Genre view

XML feed link from each view

Figure 2 - Artist view transition - flying in from the right.

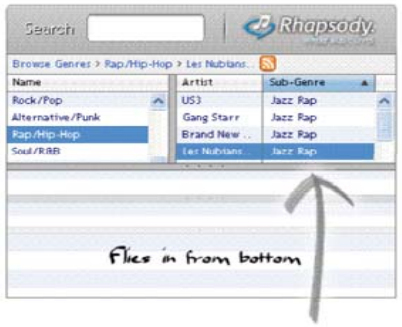


Flies in from right

Figure 3 - Artist view

clickable bread crumb trail

Figure 4 - Track view transition - flying in from bottom.



Flies in from bottom

Figure 5 - Track view

Launches the player

Figure 5 - Live-search mode. Artist list appearing as the user types.

Searches as the user types..

Figure 6 - Compact-mode, Genre view

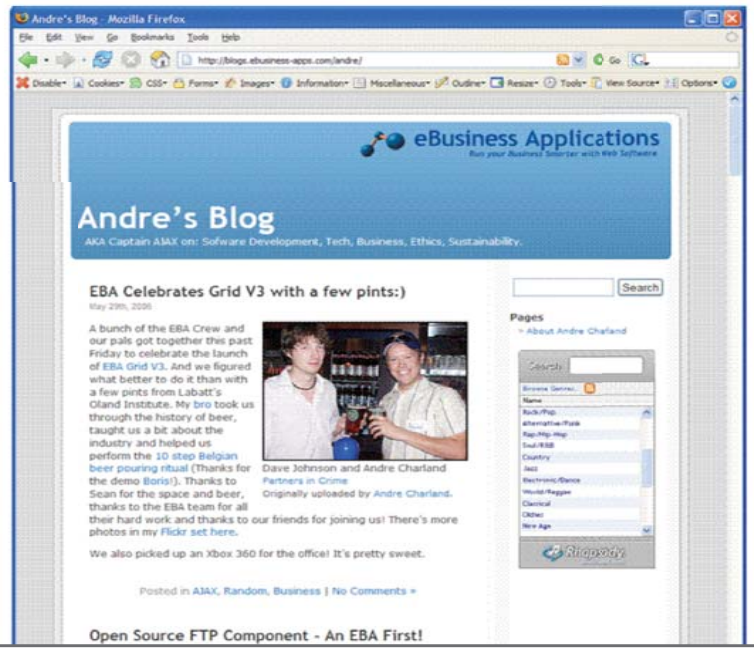
Figure 7 - Artist view transition - flies in from bottom

Figure 8 - Artist view

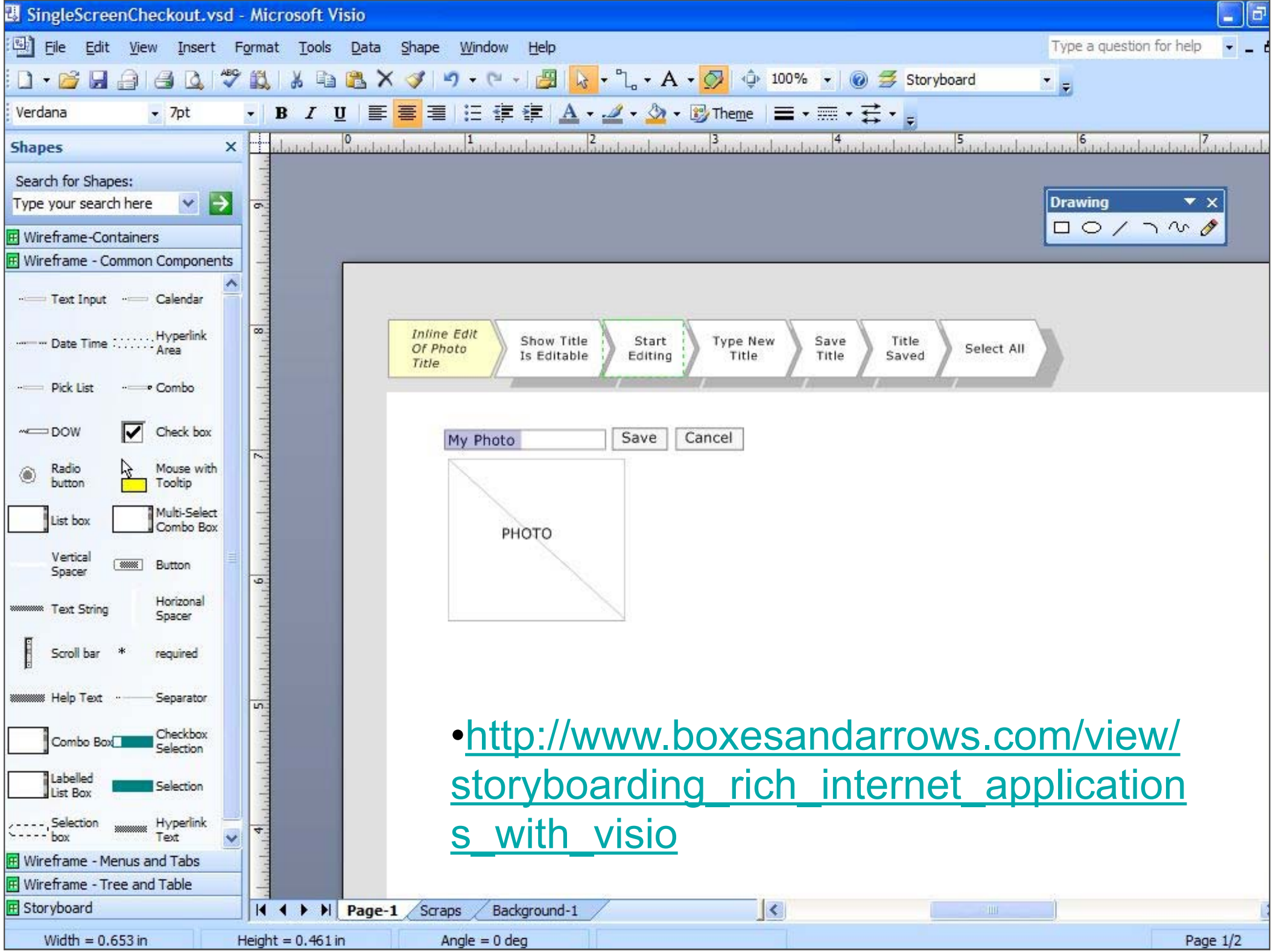
Figure 9 - Track view transition - flies in from bottom

Figure 10 - Track view

Flies in from bottom



should fit nicely into a blog sidebar.


SingleScreenCheckout.vsd - Microsoft Visio
File Edit View Insert Format Tools Data Shape Window Help
Type a question for help
Storyboard
Verdana
7pt
Theme
Shapes
Search for Shapes:
Type your search here
Wireframe-Containers
Wireframe - Common Components
Text Input
Calendar
Date Time
Hyperlink Area
Pick List
Combo
DOW
Check box
Radio button
Mouse with Tooltip
List box
Multi-Select Combo Box
Vertical Spacer
Button
Text String
Horizonal Spacer
Scroll bar
* required
Help Text
Separator
Combo Box
Checkbox Selection
Labelled List Box
Selection
Selection box
Hyperlink Text
Wireframe - Menus and Tabs
Wireframe - Tree and Table
Storyboard
Drawing
Inline Edit Of Photo Title
Show Title Is Editable
Start Editing
Type New Title
Save Title
Title Saved
Select All
My Photo
Save
Cancel
PHOTO
•http://www.boxesandarrows.com/view/storyboarding_rich_internet_applications_with_visio
Page-1
Scraps
Background-1
Width = 0.653 in
Height = 0.461 in
Angle = 0 deg
Page 1/2

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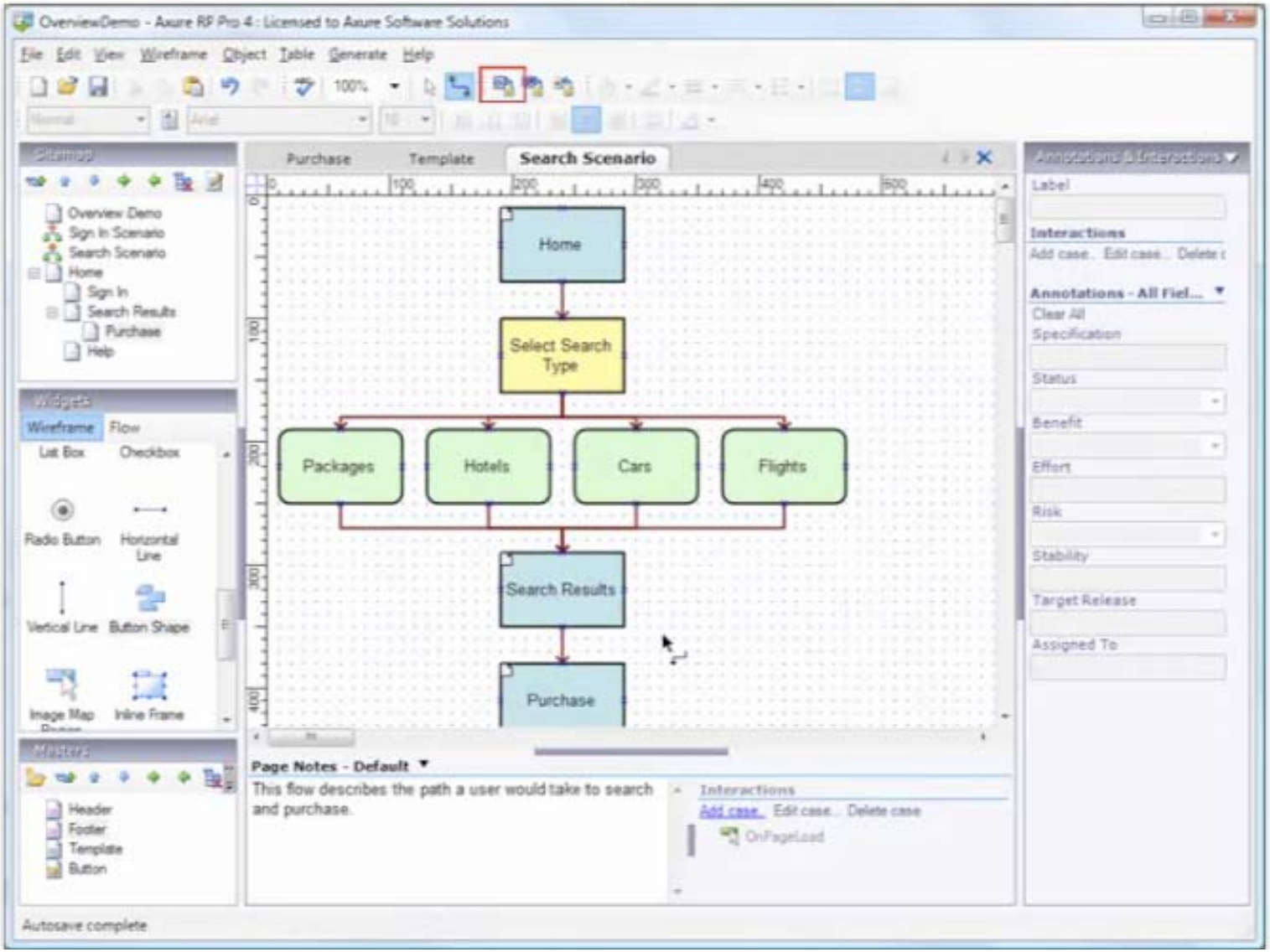

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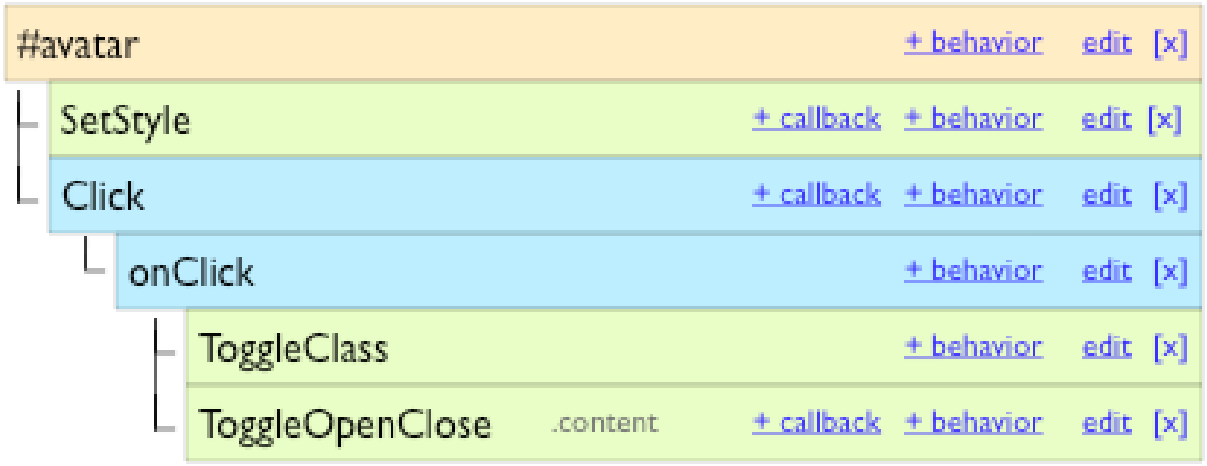
ProtoScript



www.ProtoScript.com

RIA Dev Team

- Project Manager
- Designer
- UX/Usability/UI
- Front End Developer
- Back End Developer / Integrator
- Testing / QA

Words of Wisdom

"If you think you need something never created before, think twice about it" - Bill Scott

Patterns

- Same Problem, Same Solution
- Applications
- Problems solved
- Pitfalls

Design Tips

1. Make it directly interactive
2. Make it inviting
3. Use lightweight, in-context popups instead of page transitions where possible
4. Use real-estate creatively
5. Cross page boundaries reluctantly
6. Create a light footprint
7. Think of your interactions as storyboards
8. Communicate transitions
9. Think in objects

http://looksgoodworkswell.blogspot.com/2006/01/nine-tips-for-designing-rich-internet.html

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Drag and Drop

- Use When
  - you want to manipulate a natural visual model of objects
- Potential Pitfalls
  - starting with drag & drop
  - using it to set a single attribute
  - constructing artificial visual constructs
  - using it for removal
  - confusing drag ghost with drag object
  - user's don't get it
  - creating page jitter

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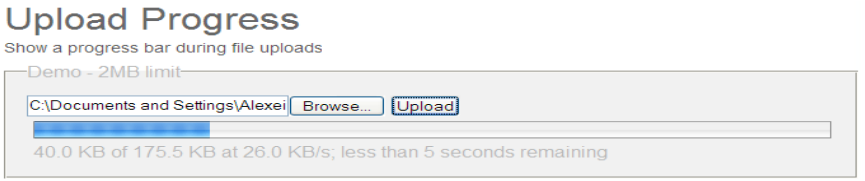
Progress Bars



- Use When
  - needing to show upload status
- Possible Pitfalls
  - non-accurate progress indication
- Best Practices
  - place the indicators as close to the file names as possible
  - finish with "completed" status if displayed in grid... otherwise finish with status and fade out

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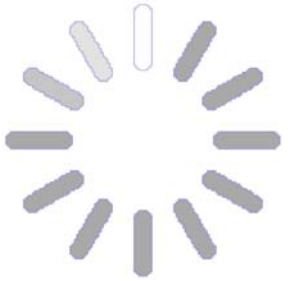
Activity Indicators

- Use When
  - need to show system is processing
  - want to show indication in context
- Possible Pitfalls
  - can be distracting if not necessary
- Best Practices
  - place the busy indication as close to the use input as possible
  - use small animated indicator beside input or inside input field
  - place the busy indication at the place where the results will appear
  - use an overlay with translucency if redirecting attention
  - don't use too many indicators as it will make for a noisy interface
  - avoid using indicator if delay is really short (<1 Sec)



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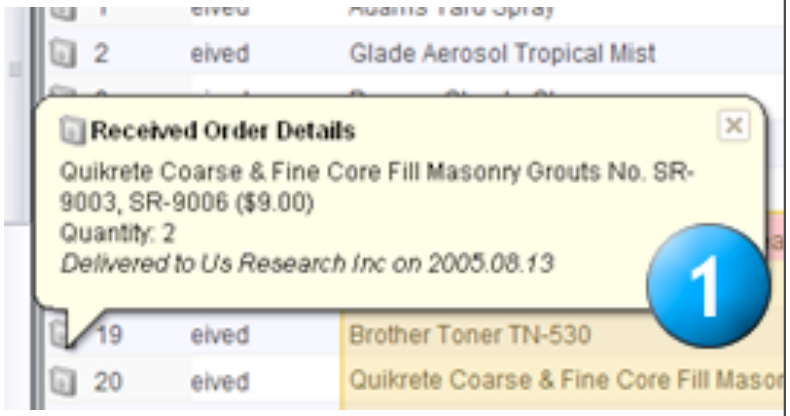
Fading and Color Changing

- Use When
  - need to spotlight a change occurred
- Possible Pitfalls
  - if too many places, can be distracting
- Best Practices
  - use in just one or two selected areas
  - if more, make sure that there aren't too many updating at once
  - if area is large, consider more subtle coloring
  - fade out quickly (usually less than one second; but much faster is acceptable)

Rollovers

- Use When
  - need to show detail in context
- Potential Pitfalls
  - popup too quick
  - popup too slow, seem sluggish
- Best Practices
  - show detail after 0.25 second delay
  - dismiss immediately on mouse out or click



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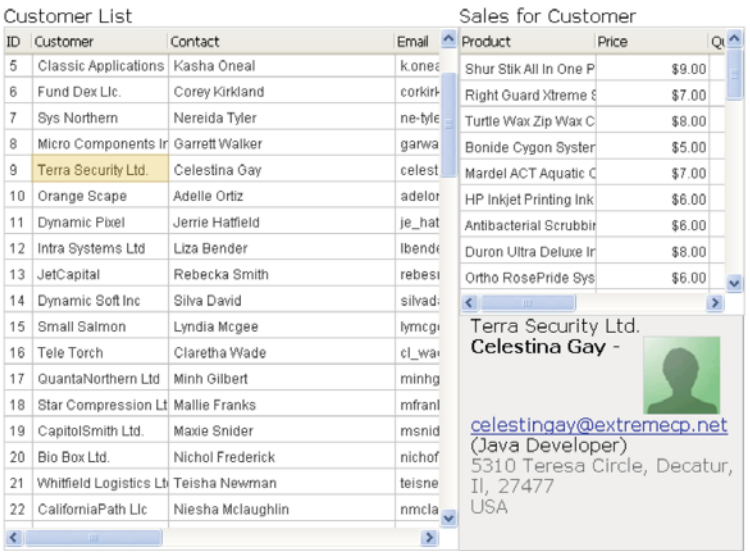
In-Place Editing

- Use When
  - item being edited is multi-field
  - you want to be explicit about the edit mode
- Potential Pitfalls
  - discoverability
  - too subtle of invitation
  - clutter visual display w/ invitations
  - making page jump

Master Detail

- Use When
  - Browsing relational data
- Possible Pitfalls
  - Confusing to user
- Best Practices
  - Drill Down
  - Keep it light
  - Provide indicator during wait



Live Search

- Use When
  - user needs to search for content and are uncertain on the correct keywords.
- Potential Pitfalls
  - if results are returned too quick, will be distracting
  - if results are not returned quick enough, it will feel sluggish
- Best Practices
  - start returning results when the user "slows down" typing
  - show results below text entry field for feedback

Customers 1-16 Name: Alpha

Customer	Balance
Alpha 3000	-$99,484.00
Alpha Applications	$0.00
Alpha Communications LTD	$5,626,565.00
Alpha Constructions INC	$339.00
Alpha Eastern	$0.00
Alpha Solutions	$791.00
AlphaApproach Llc.	$146.00
AlphaCentric Llc.	$0.00
AlphaCentricity INC	$756.00
AlphaDesign	$72.00
AlphaIT Solutions Llc.	$0.00
AlphaPad Inc.	$1,239.00
AlphaStaff IT Inc.	$0.00

Page

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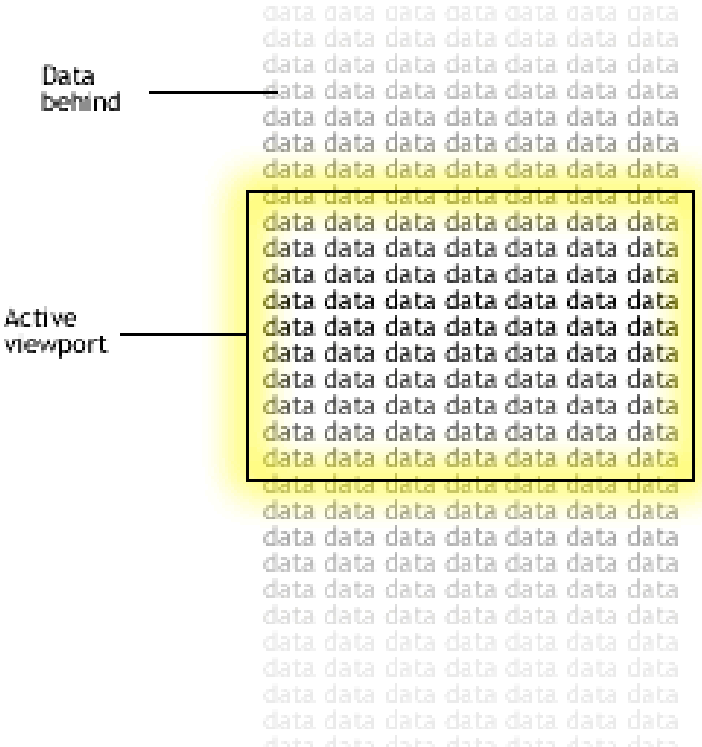
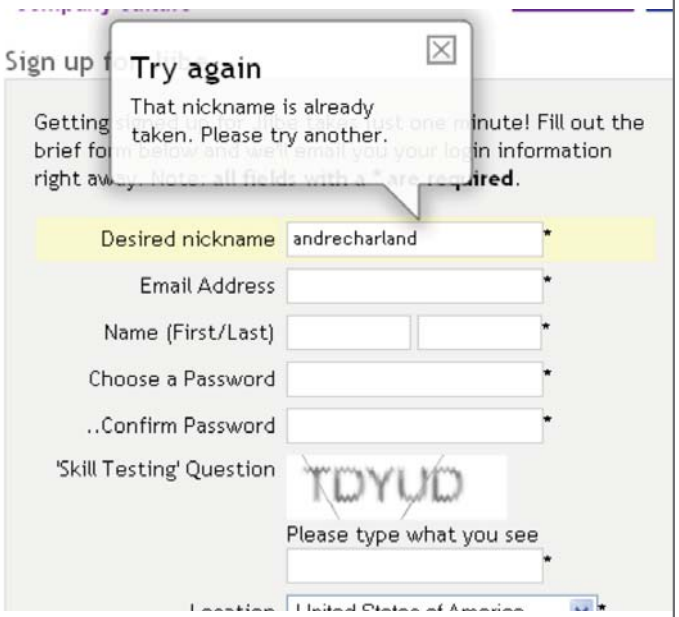
Live Scrolling

- Use When
  - chunking data would affect user flow
  - content is data; not search results
  - data content will be sorted, filtered, etc.
  - selection model is continuous
- Potential Pitfalls
  - dual-scrollbar issue
  - sluggish performance
  - extremely large data sets
- Best Practices
  - provide dynamic tooltip showing location within scroll
  - animate scroll



Live Form

- Use When
  - User entered data needs to be validated on the fly and cannot be checked locally
- Best Practices
  - Generation of new fields is required
  - Validation and feedback from the server is needed
  - Removing or disabling parts of the form
  - Submitting data to the server before completion
  - Server side validation without refresh



Invitation

- Use When
  - You want to invite the user to click or interact with the object being hovered over.
- Potential Pitfalls
  - discoverability
- Best Practices
  - use hover to reveal interaction
  - use the familiar to teach the new
  - use tours sparingly
  - think of how it will interact with rest of page

Auto Complete

- Use When
  - The users needs to quickly and accurately select from a large list
- Potential Pitfalls
  - displaying completions too soon
  - displaying completions too often
- Best Practices
  - don't require the user to arrow or mouse to the selected item
  - tab should select the best match
  - delay popup until user
  - slows typing

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Object Selection

- Use When
  - in a scrolled table
  - selecting objects
- Potential Pitfalls
  - complexity of contiguous vs. discontiguous
  - using CTRL for discontiguous will not work on Macintosh
- Best Practices
  - allow multiple selection
  - allow discontiguous selection

Contact Name	Contact Email	Job Title
Tammara Farley	tamfarley@halifax.com	Media Director
Dwana Barton	dwabarton@ebadev.com	Budget Analyst
Mercedes Carpenter	mcarpenter@purosync.net	Finance Manager
Lucas Blake	lblak@freeinterweb.com	Marketing Manager
Lilli Bender	lbender@sharesync.com	Purchaser
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Periodic Refresh

- Use When
  - content is based on live information
  - for enticing users to click-through
- Potential Pitfalls
  - can be distracting if not primary
- Best Practices
  - if secondary to page, then make refreshes less frequent and simple
  - if primary to page, then make refreshes more frequent & visible

Composite Patterns

- eCommerce
- Search
- Multiple patterns in harmony
- Real world

Single Page Checkout Demo

- One Page
- Not crossing pages
- Liveforms
- Goal increase conversion rates
- ElasticPath.com

Dynamic Searching

- Dynamic Searching
- Hover
- Live Scrolling
- Adiamor.com

Auto Commit

- Protect the user with “Auto Save”
- Careful of permanent changes
- Confirmation
- Acceptance
- Undo (multi level)

Polling and Push

- Polling is often good enough
- Push often needs some some none JS
  - I.e. Flash
  - Comet

Pattern Resources

- Yahoo Pattern Library
  - Bill Scott
- UI-Patterns.com
- AjaxPatterns.org
  - Michael Mahemoff
- Designing Interfaces
  - http://designinginterfaces.com/

Go record your own!

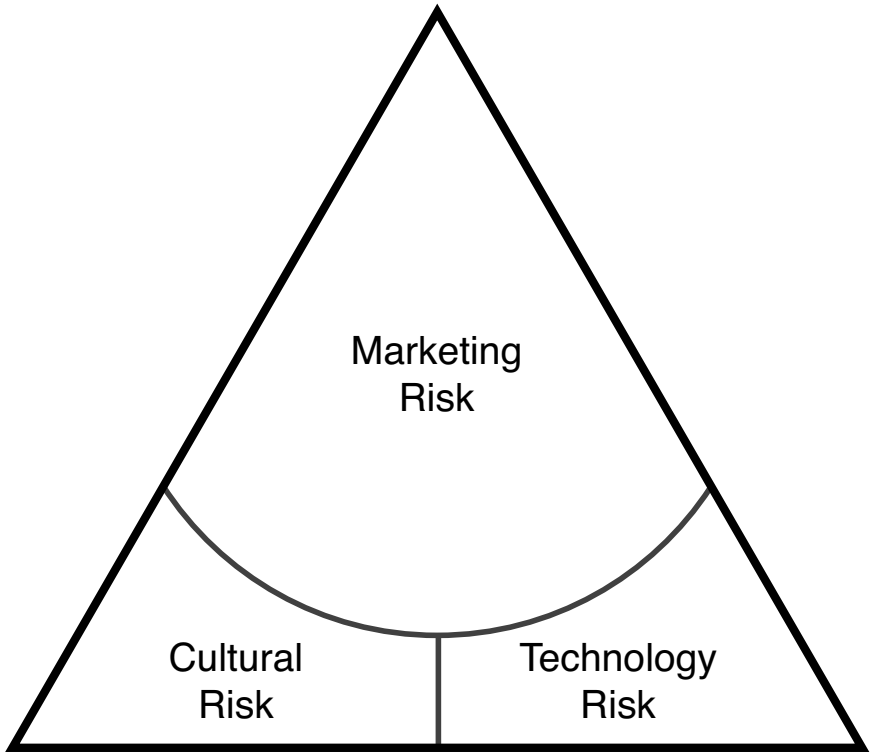
VOICES THAT MATTER CONFERENCE
GOOGLE WEB TOOLKIT

Exercise

- Pick a web app
  - Gmail, internal, google spreadsheets
- Identify Patterns
  - Good
  - Bad
- Discuss

VOICES
THAT
MATTER
CONFERENCE
GOOGLE WEB TOOLKIT

Risks


Marketing
Risk
Cultural
Risk
Technology
Risk

Technical Risks

- Design
- Development
- Maintenance
- Security
- Browser Capabilities
- Timeline and Cost

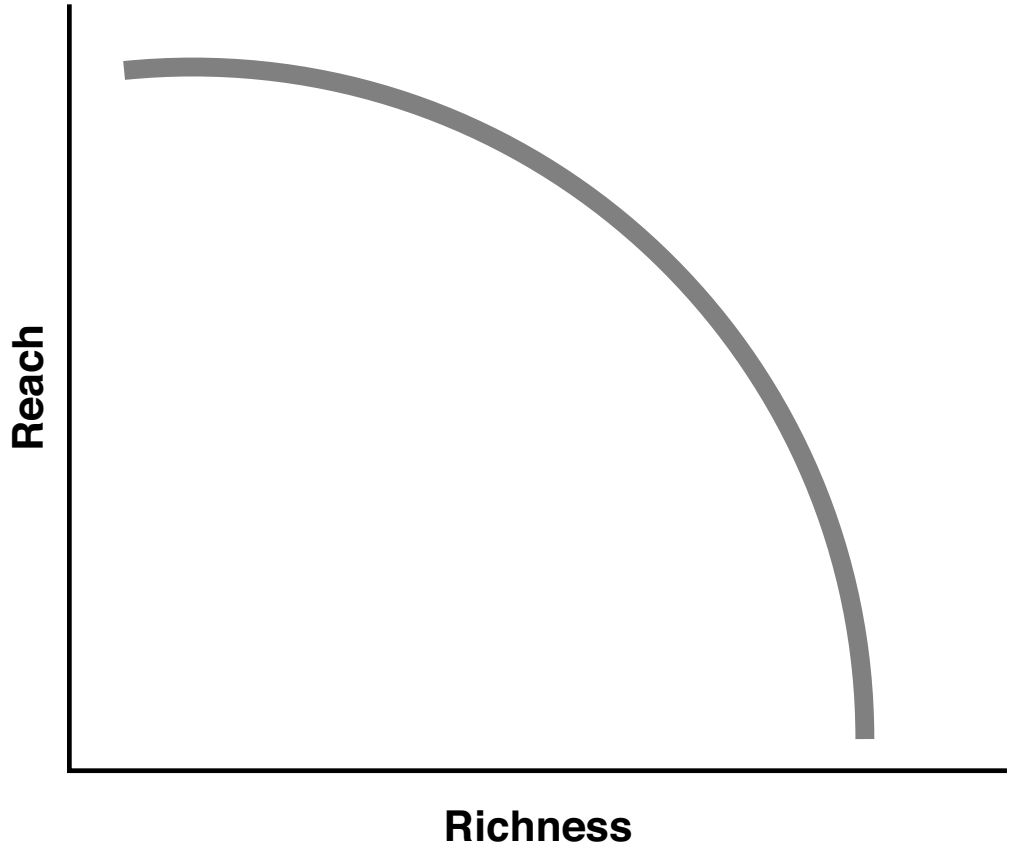
Cultural and Political Risks

- Usability
- User experience
- Attitudes
- Expectations
-

Marketing Risks

- Penetration
- Sales
- Donations
- Branding
- Sign Ups

Reach vs Rich



Search Engines

- Definitely a risk for public apps
- Search engines are adapting
  - Google Events
- Unique URLs
- Be careful with “black hat” techniques

SEO Tips

- Avoid Ajax (use sparingly)
  - For Primary Navigation
  - Content driven site where SERPs are important
  - Links that need to be followed by bots

Reach

- Very real marketing risk
- 3% - 10% of public has JS turned off*
- Radically different or UIs can intimidate
- Lower search engine can affect business
- Apps will have to balance this vs innovation to gain market share

Monetization

- Ok for Cost Per Click (CPC)
- Bad for Cost Per Impression (CPM)
- Event trigger for ads?
- Content matching

Risk Mitigation

- Use a framework or components
- Progressive enhancement
- Google sitemaps
- Visual cues and enhancements
- Avoid gold plating
- Pick your revenue model carefully

Offline Ajax

- Google Gears
- Adobe AIR
- FireFox 3.0
- Local Data Storage (IE, FireFox, Flash)

Action Plan

- Recognize the need for usability
- Get management support
- Devote specific resources
- Integrate systematic practices
- Test all interfaces for usability

Questions?

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www.nitobi.com

References & Resources:

www.enterpriseajax.com

www.billwscott.com

www.designinginterfaces.com