

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 14:
Testing and Patterns

James Fogarty
Eunice Jun
David Wang
Elisabeth Chin
Ravi Karkar



Tuesday / Thursday
10:30 to 11:50

Project Status

Looking Forward

3c: Usability Testing Check-In due Today

- Changes from Inspection
- Changes from First Usability Test

3d: Usability Testing Review due Thursday 2/23

Other Assignments

Reading 4 Posted, Due Friday 2/24

(you should engage before that if you can)

Exam

In-Class
Next Tuesday 2/21

Mostly short answer,
some long answer

Content drawn from
lecture and readings

Compilation of the lecture slides is posted

Q&A scheduled Monday at 1:30 in CSE 403

A screenshot of a Facebook post by Don Patterson. The post asks if there will be a study guide for the exam, with a response from James Fogarty and a reply from Don Patterson.

Don Patterson 21 hrs ·

Student: "Will there be a study guide for the exam?"
Me: "Yes, the textbook, my lectures and any supplemental information from the Internet that you find helpful!"

Like **Comment** **Share**

You, John Krumm, Stephen Voida and 44 others

James Fogarty I'll point my students at your guide.
Like · Reply · 3 · 21 hrs

Don Patterson It's actually quite a robust study guide.
Like · Reply · 4 · 21 hrs

Write a reply...

Testing and Patterns

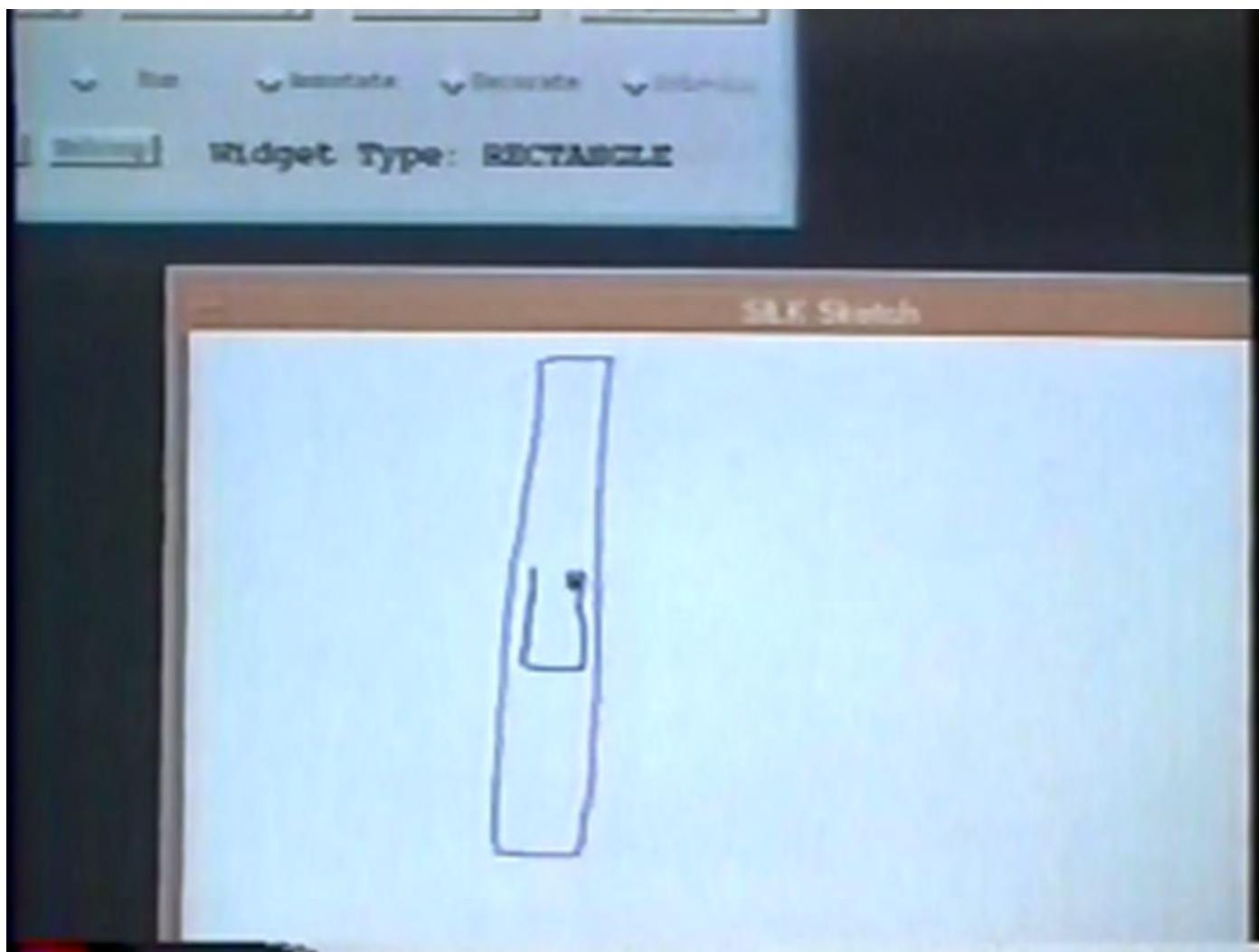
Wizard of Oz and Low Fidelity Testing

Remote Usability Testing

Controlled A/B Experiments

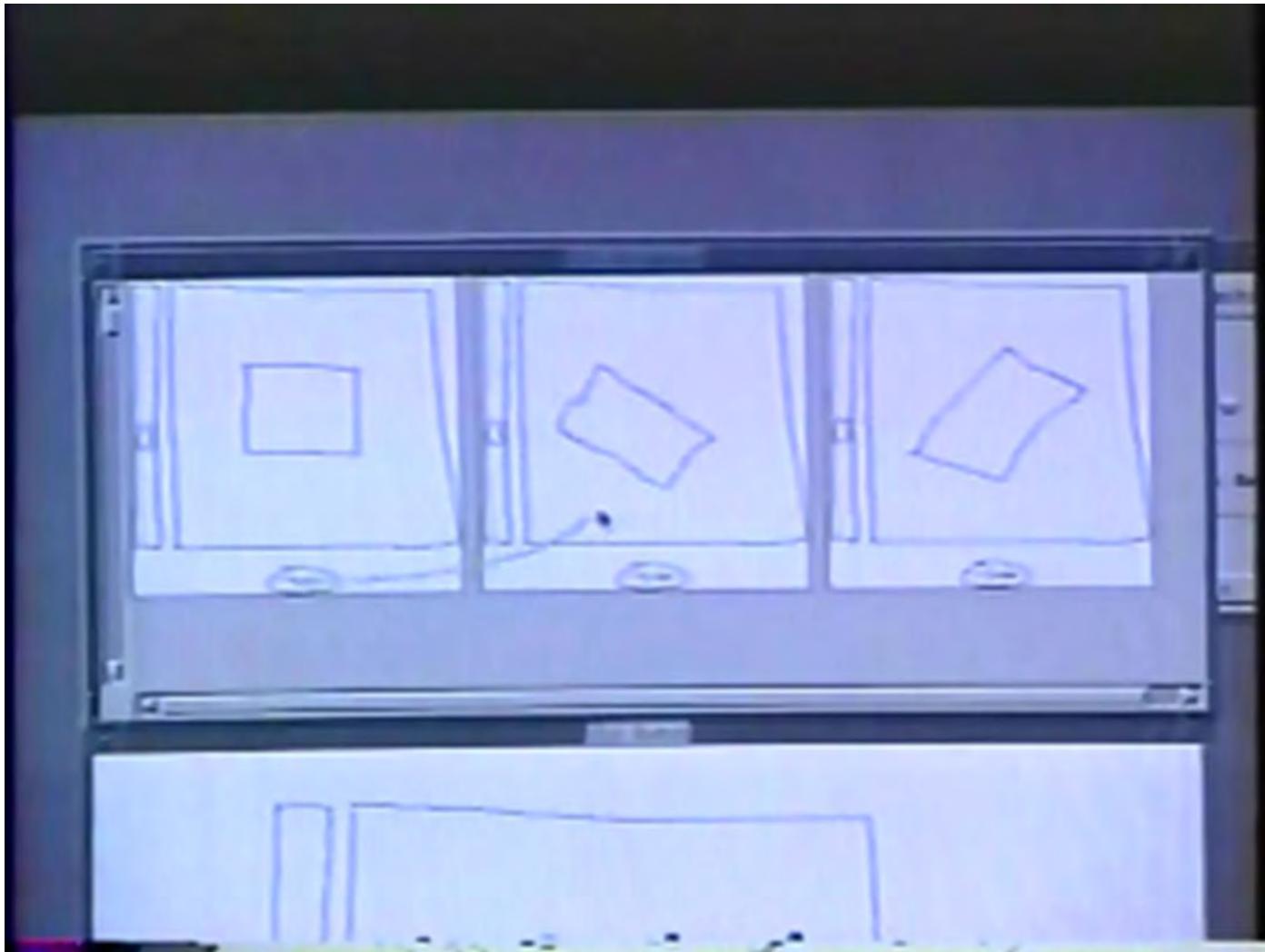
Patterns

SILK (1996)



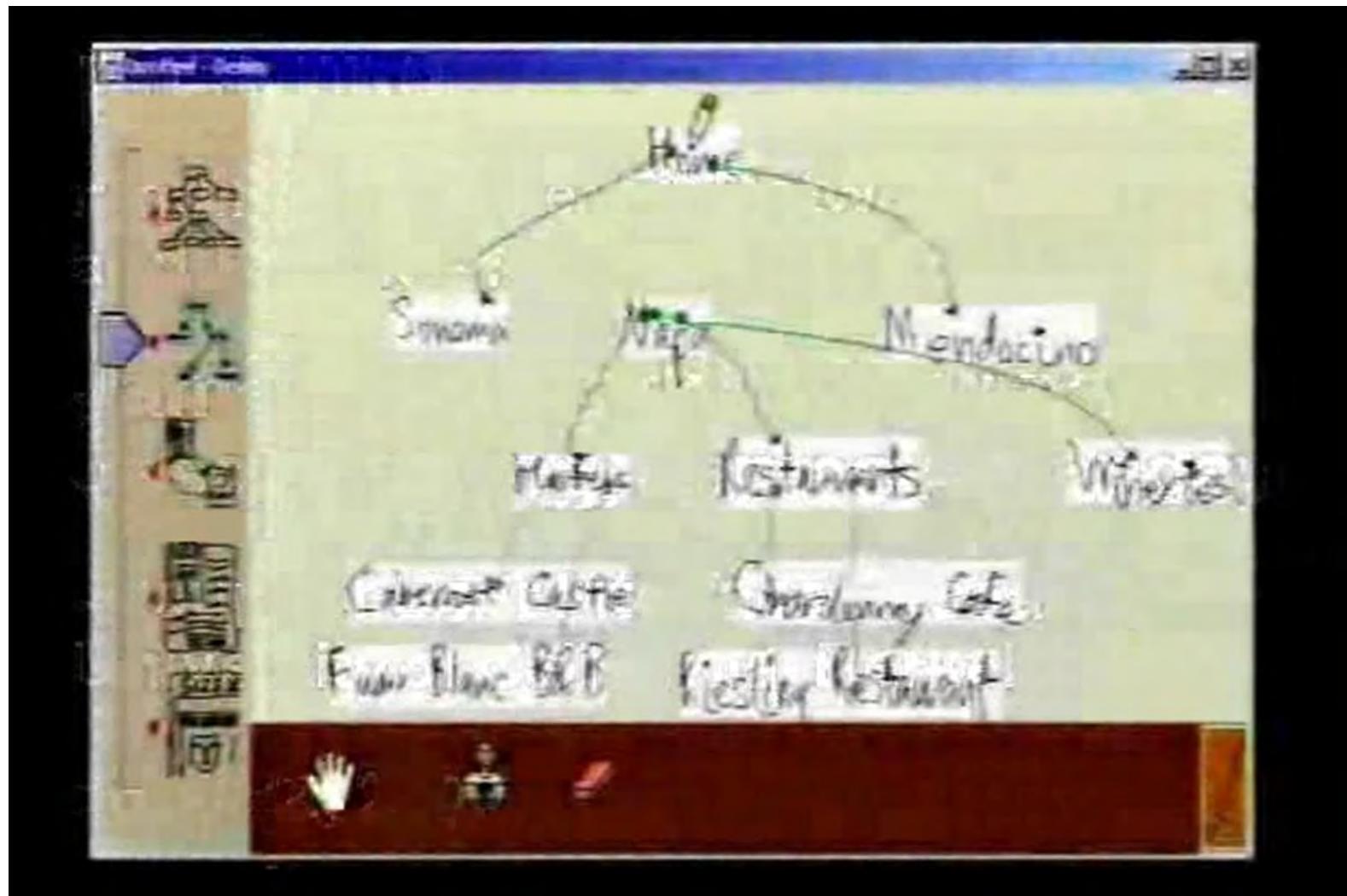
Informal Interaction

SILK (1996)



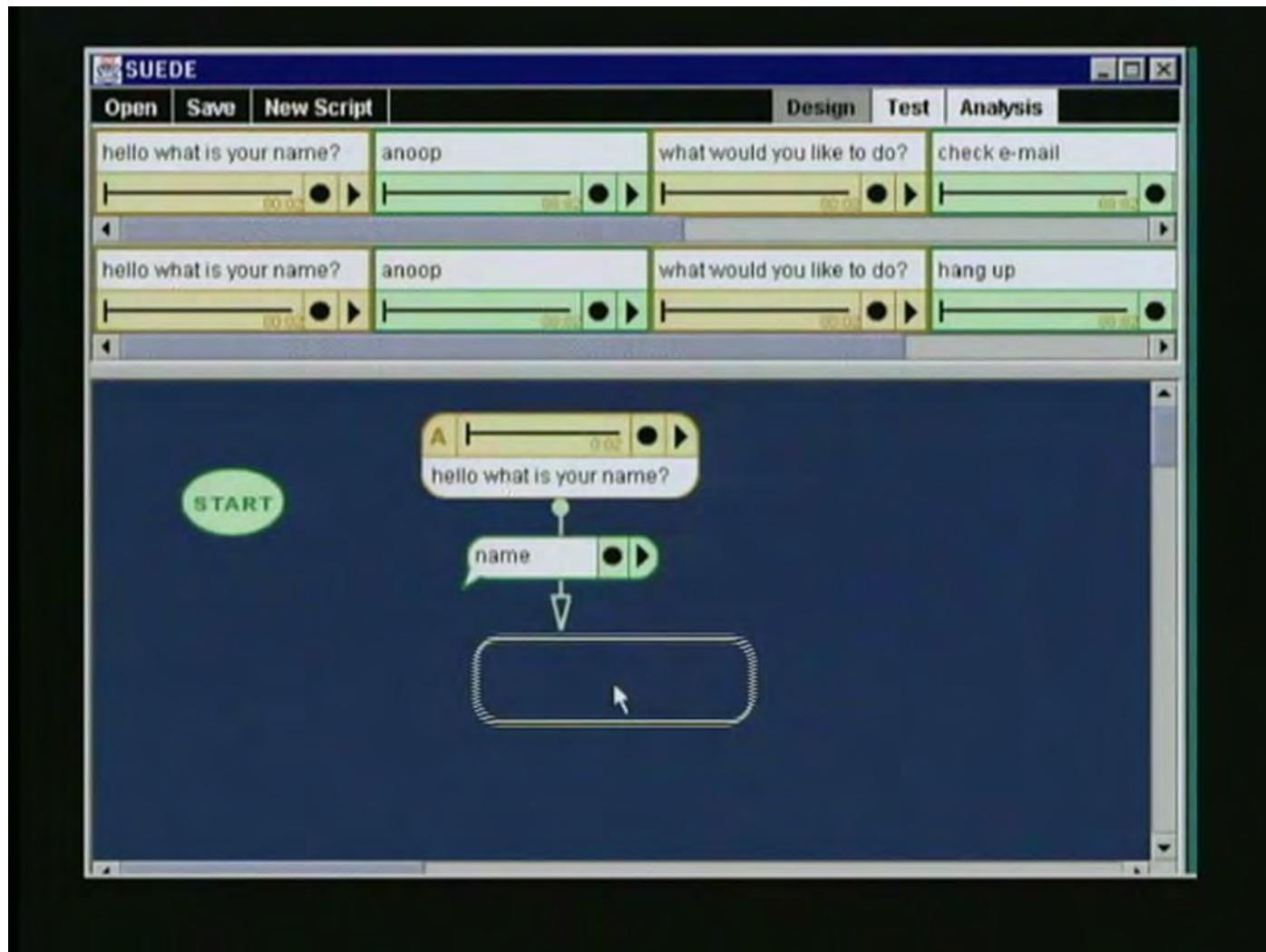
Migrate to Prototype, Storyboard-Based Programming

DENIM (2000)



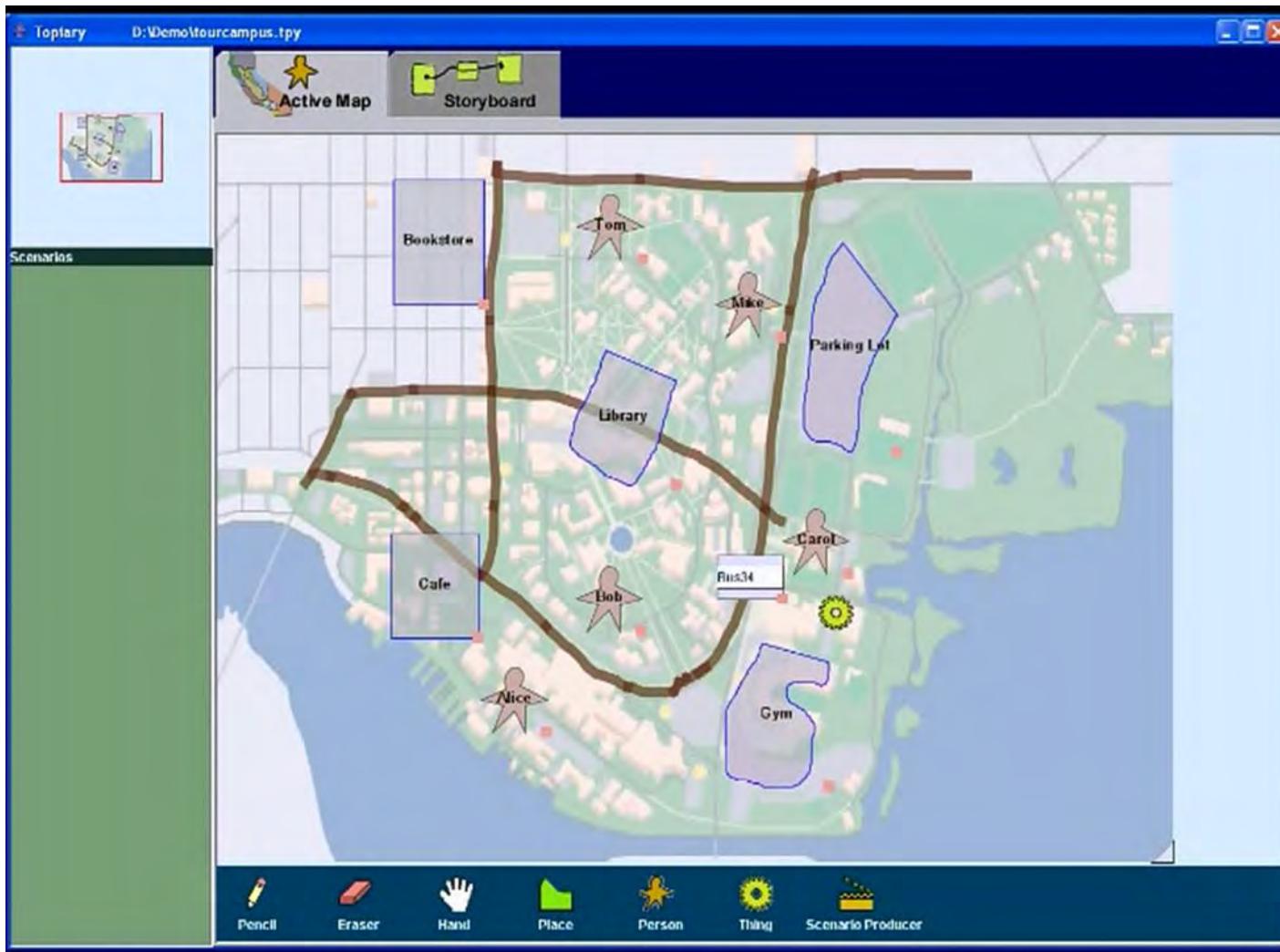
Early Stage, Multiple Levels of Details, Sketching, Pen Interaction

SUEDE (2000)



Low-Fidelity Is Not Just About Ink

Topiary (2004)



Location Awareness, Wizard of Oz

Activity Designer (2008)

ActivityDesigner

Activity-Based Prototyping of Ubicomp Applications

Yang Li & James Landay

Computer Science & Engineering
University of Washington

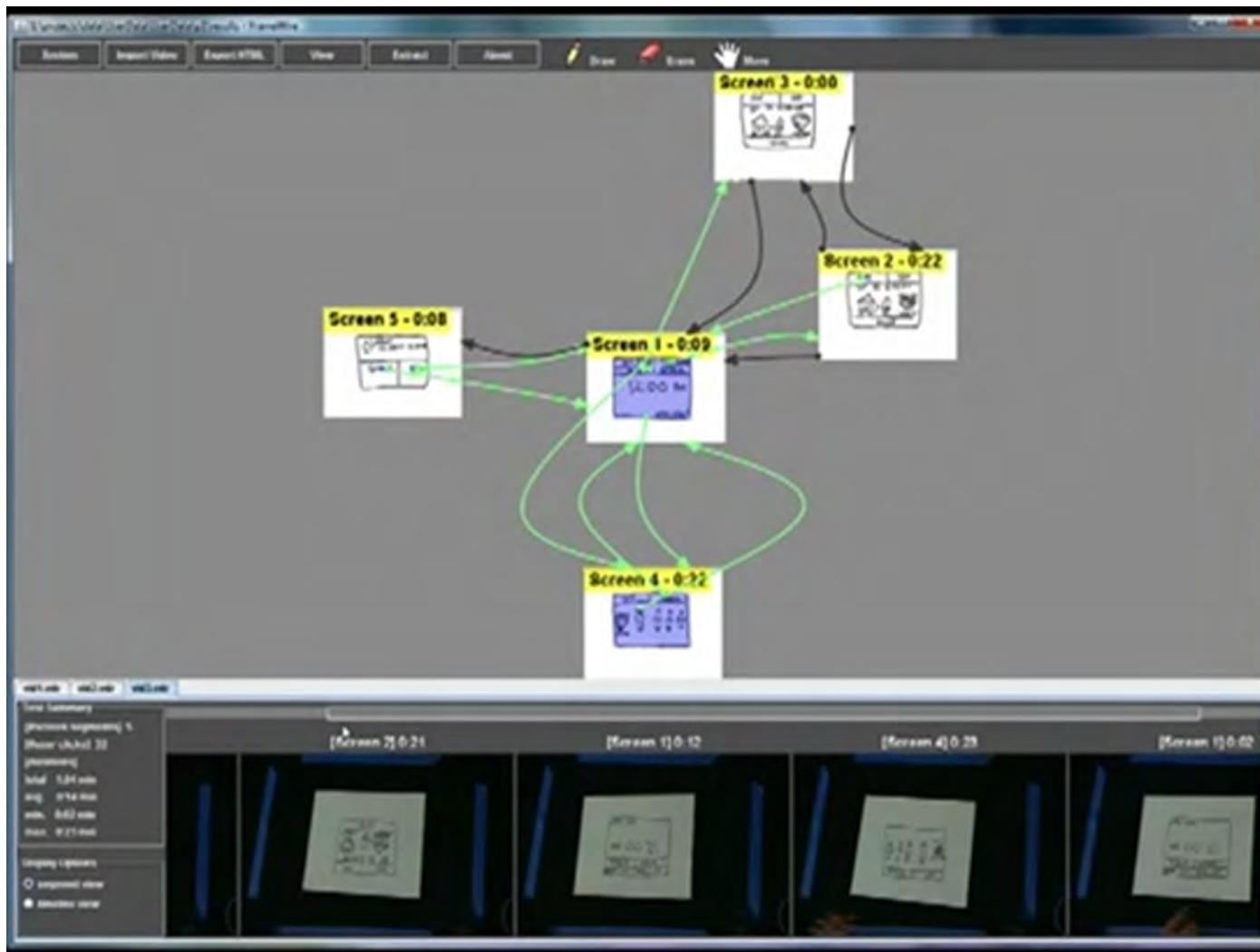
Intel Research Seattle

January 2008



Long-Lived Activities

FrameWire (2010)



Tangible Interaction

Testing and Patterns

Wizard of Oz and Low Fidelity Testing

Remote Usability Testing

Controlled A/B Experiments

Patterns

Remote Usability Testing

Conferencing-based testing

Use tools like video conferencing, instant messaging, and screencasting to test with a remote participant

Semi-automated remote testing

Automatic logging and some analysis of usage

Controlled online A/B experiments

Carefully measure results of showing different versions to different sets of live customers

Semi-Automated Remote Usability

Now available through a variety of services

Loop11

UserZoom

TryMyUI

Validately

Userlytics

WhatUsersDo

Usertesting.com

YouEye

Unlikely you need to bake your own

Some include mobile testing

Crowds for automated testing in build processes

Semi-Automated Remote Usability

Move usability testing online

participants access the “lab” via web

answer questions & complete tasks in “survey”

records actions or screens for playback

can test many people completing many tasks

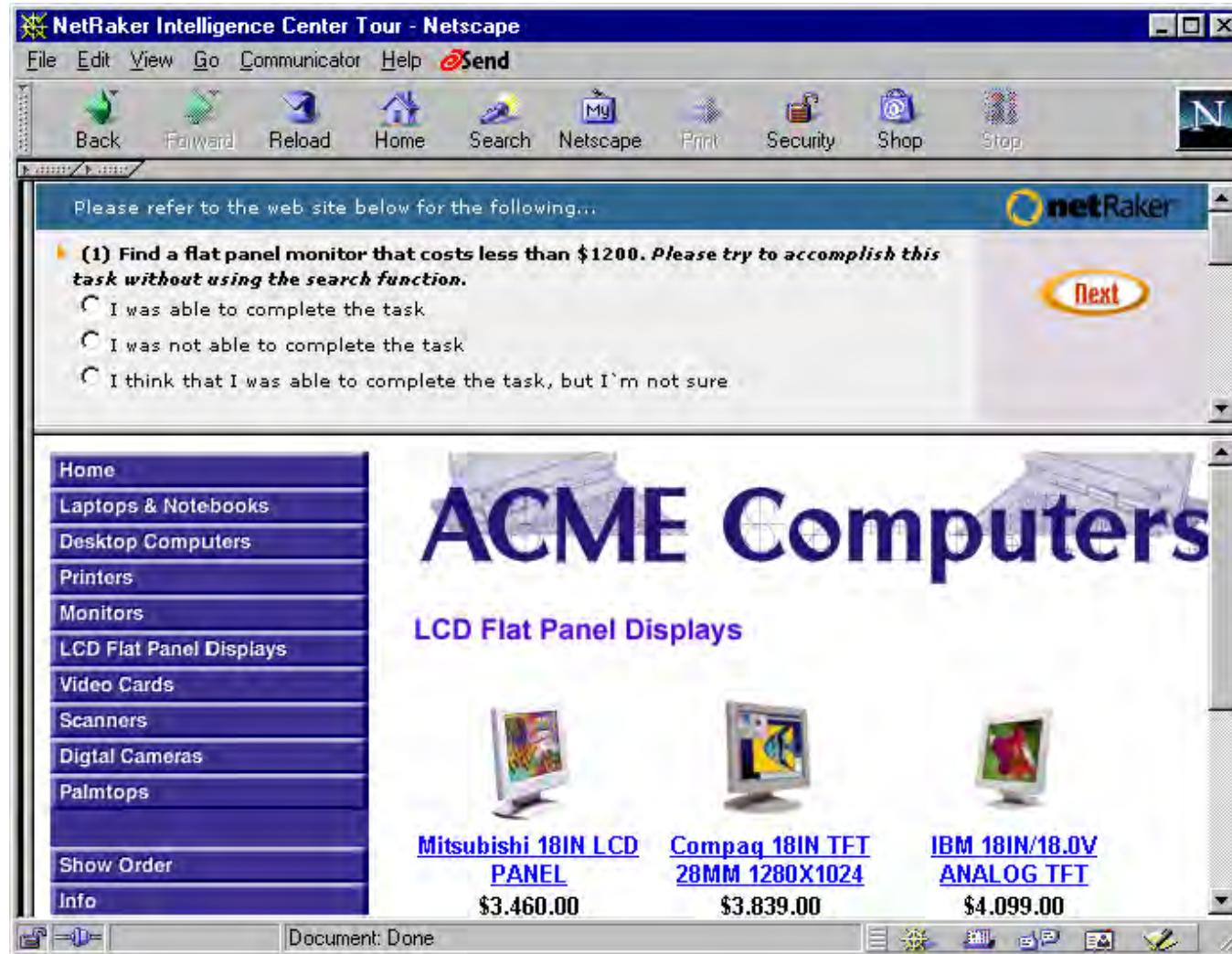
Analyze data individually or in aggregate

playback individual sessions

find general problem areas

if needed, look closely with traditional methods

Semi-Automated Remote Usability



Semi-Automated Remote Usability

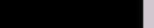
NetRaker Intelligence Center Tour - Netscape

File Edit View Go Communicator Help 

Back Forward Reload Home Search Netscape Print Security Shop Stop 

Percentages Totals Respondents Details Demographics

► 1. Find a flat panel monitor that costs less than \$1200. Please try to accomplish this task without using the search function.

Task	Response(s)
I was able to complete the task	90% 
I was not able to complete the task	10% 
I think that I was able to complete the task, but I`m not sure	0% 

Response Times

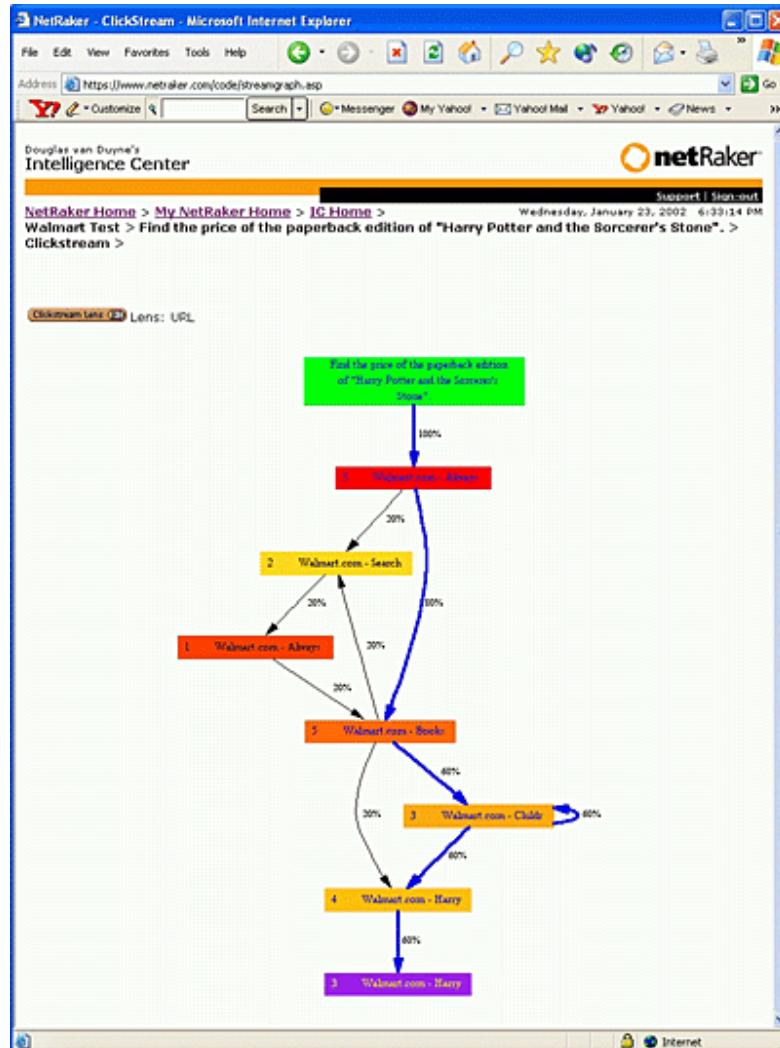
Fastest: 00:00:28
Median: 00:00:41
Average: 00:00:48.4
Slowest: 00:01:14

► 2. What is the price of the monitor you just found?

Short Freeform

\$1129

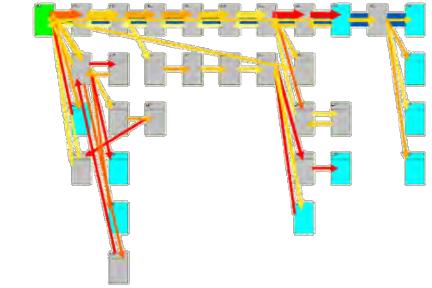
Semi-Automated Remote Usability



WebQuilt: Visual Analysis

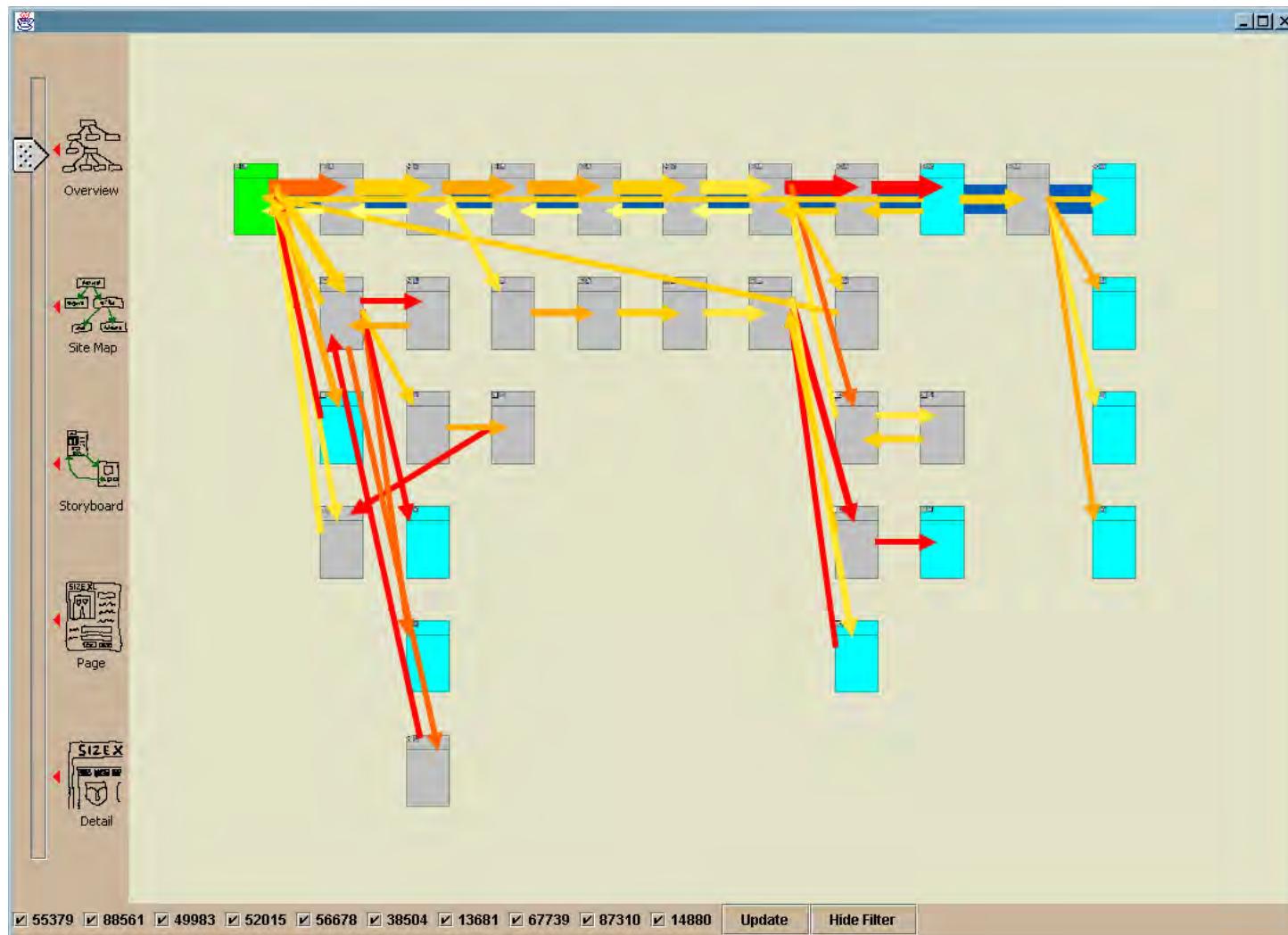
Goals

- link page elements to actions
- identify behavior/navigation patterns
- highlight potential problems areas

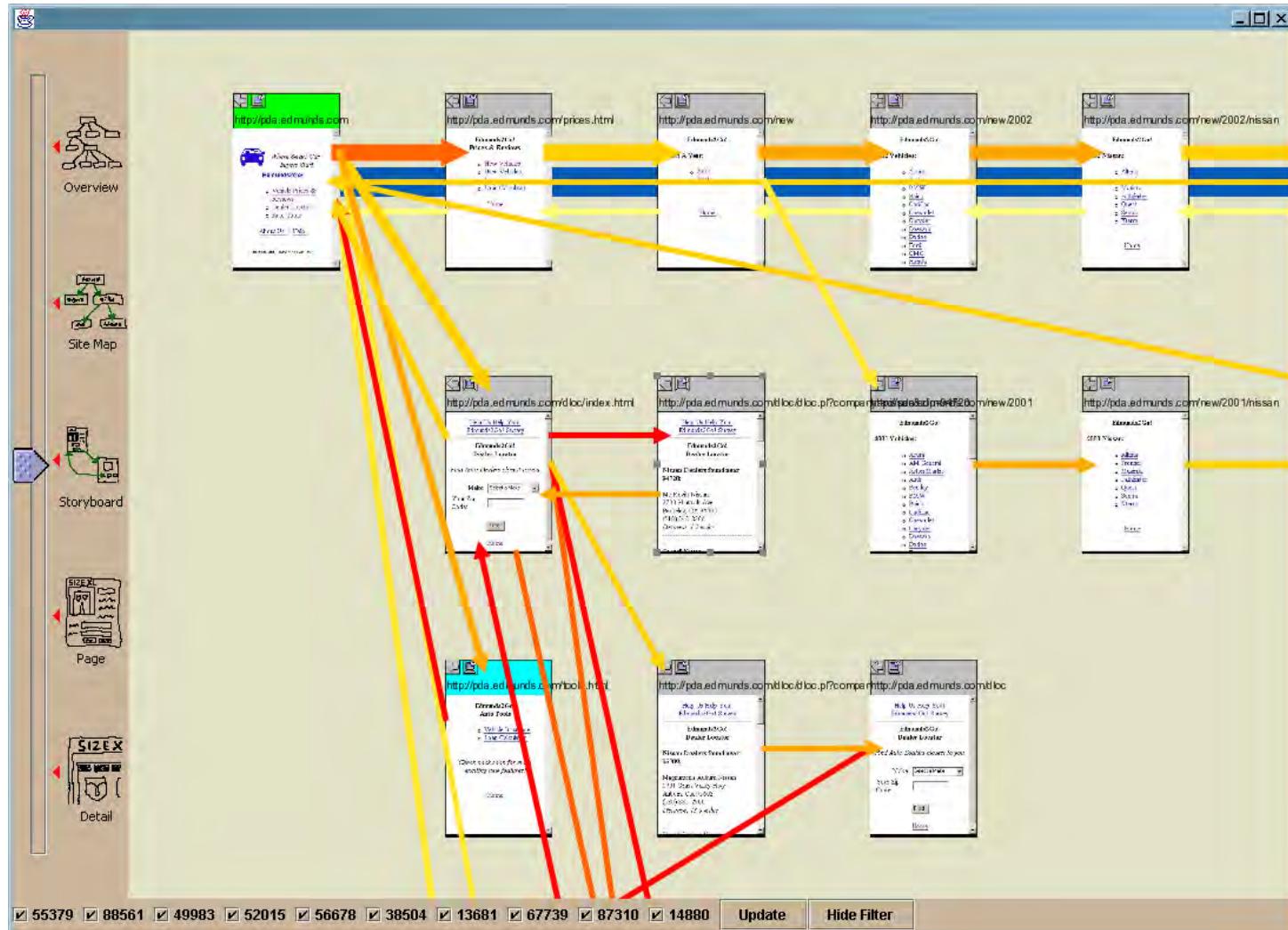


Interactive graph based on web content
designers can indicate expected paths
color code common usability interests
filtering to show only target participants
use zooming for analyzing at varying granularity

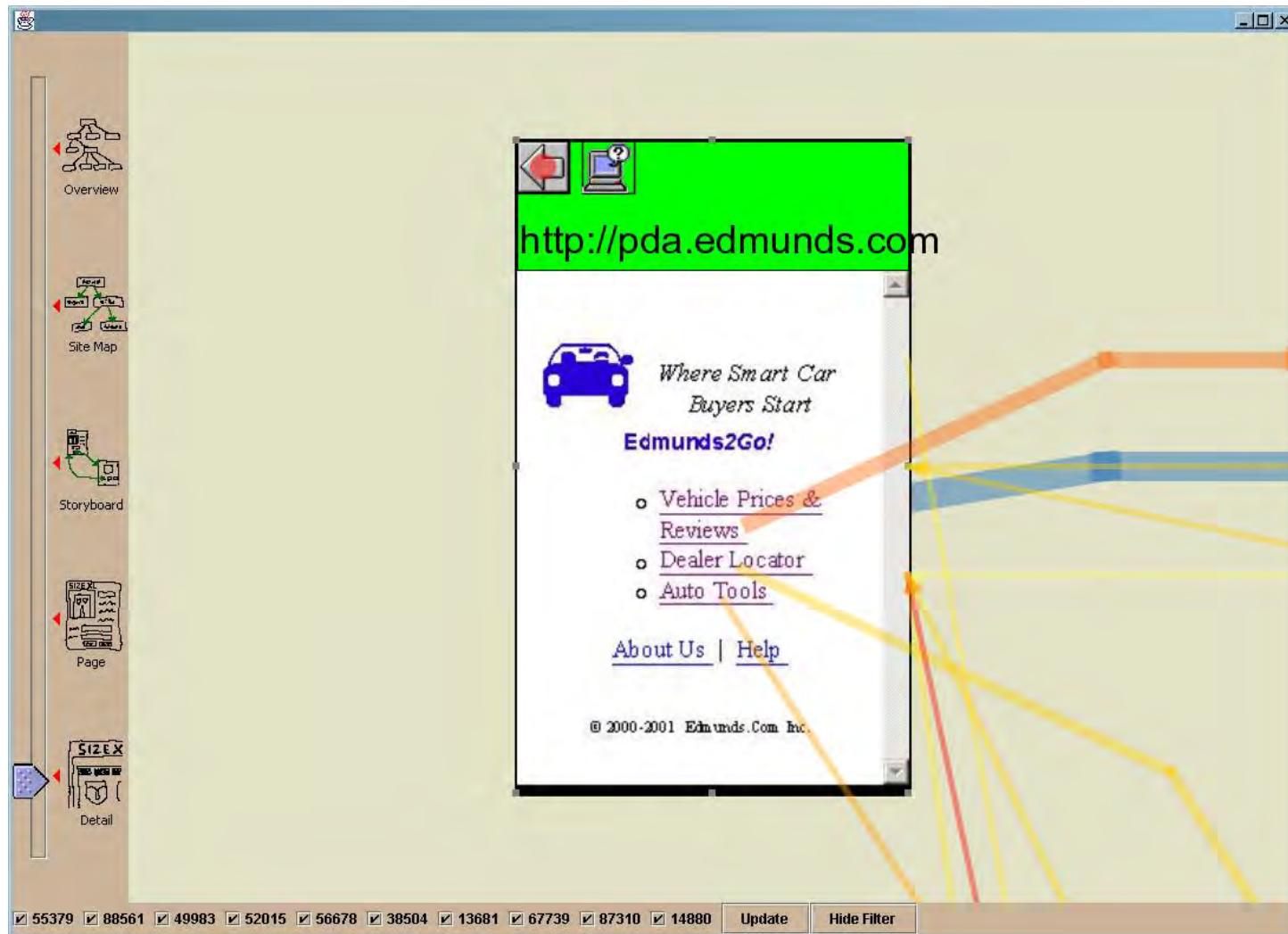
WebQuilt: Visual Analysis



WebQuilt: Visual Analysis



WebQuilt: Visual Analysis



Testing and Patterns

Wizard of Oz and Low Fidelity Testing

Remote Usability Testing

Controlled A/B Experiments

Patterns

Controlled A/B Experiments

Many names for it

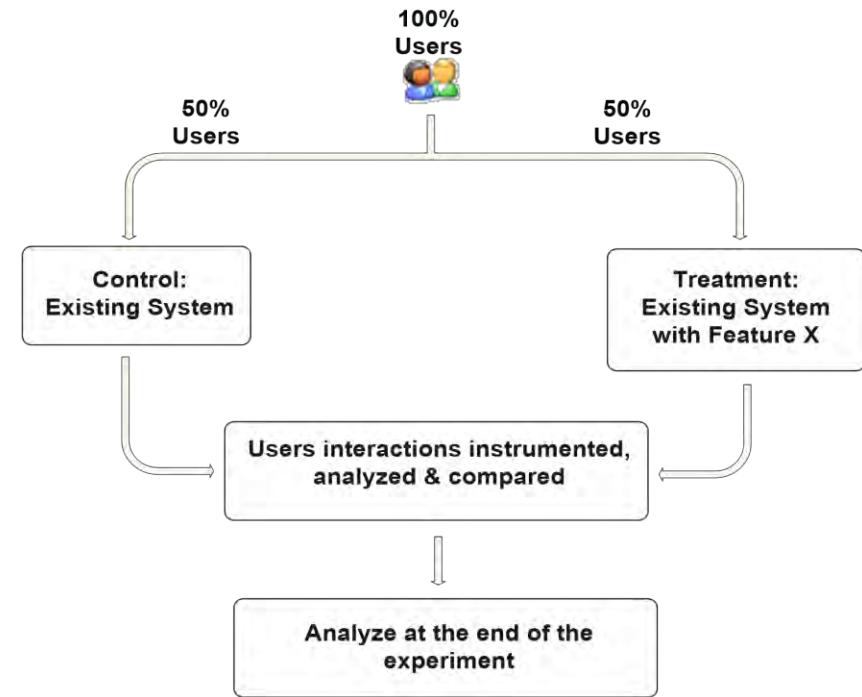
A/B tests or
Control/Treatment

Randomized
Experimental Design

Controlled experiments

Split testing

Parallel flights



(this section mostly due Ronny Kohavi)

Controlled A/B Experiments

Example: Amazon Shopping Cart Recommendations

Add an item to your shopping cart

Most sites show the cart

At Amazon, Greg Linden had idea to show recommendations based on cart items

Controlled A/B Experiments

Evaluation

Pro: cross-sell more items

Con: distract people from checking out

Highest Paid Person's Opinion:

Stop the project

Simple experiment run:

Wildly successful

Marketplace: Solitaire vs Poker

Experiment run in Windows Marketplace / Game Downloads

Which image has the higher clickthrough? By how much?



A: Solitaire game



B: Poker game



Marketplace: Solitaire vs Poker

Experiment run in Windows Marketplace / Game Downloads

Which image has the higher clickthrough? By how much?

The screenshot shows the Windows Marketplace interface. A red circle highlights the product listing for "Solitaire Master 2" by Egames. The listing includes a thumbnail image, the game title, developer information, a brief description mentioning 300 games like Klondike, Free Cell, Deuces Queens, Cats Cradle, Four Leaf Clover, Spider Web, and many more, and a price of \$12.99. Below the listing is a green "ADD TO CART" button.

A: Solitaire game

A is 61% better

The screenshot shows the Windows Marketplace interface. A red circle highlights the product listing for "5 Card Draw Poker" by Andrei Jurko. The listing includes a thumbnail image, the game title, developer information, a brief description mentioning it's one of the most popular poker variations, nice graphics and sound, and a price of \$9.95. Below the listing is a green "ADD TO CART" button.

B: Poker game

Never Underestimate Solitaire

SIX CHIX

BY RINA PICCOLO



Never Underestimate Solitaire

Candy Crush maker bought by Activision

fortune.com/2015/11/03/activision-king-digital/

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TECH ACTIVISION

Activision Acquires Candy Crush Maker King Digital For \$5.9 Billion 12:34 AM EST

Voters In This State Could Make Marijuana History Today 11:18 AM EST

Cisco's Chambers Issues a Warning 8:04 AM EST

Look at what is being sold to kids in school 8:00 AM EST

While cable TV "unbundles," streaming services bulk up 6:00 AM EST

Fast-Flying Drone Avoids Obstacles: Here's How 5:57 AM EST

Obama Slams Republicans Over CNBC Debate Drama 4:51 AM EST

Amazon Is Opening An Actual, Real-Life Bookstore 7:38 AM EST

Alphabet's Ambitions 2:36 AM EST

How Uber's Top Lawyer Wins Equal Pay For Women 7:35 AM EST

Xiaomi's expansion to Africa comes with concessions 7:22 AM EST

Why Activision Spent \$5.9 Billion on "Candy Crush" Creator King Digital 6:30 AM EST

Standard Chartered is the latest big bank to slash and burn 6:29 AM EST

Activision's candy crush and Tesla 3Q ~ 5 things to know today 6:14 AM EST

Here's why the company behind Keystone just asked for a delay 6:06 AM EST

Protestors occupy Airbnb HQ on eve of San Francisco vote 6:29 AM EST

How Google Co-founder Larry Page Decides On His Next Big Bet 2:40 AM EST

California Gov. Jerry Brown: Time Is Running Out For Cleaner Energy 1:45 AM EST

Use Your AmEx Points to Book on Airbnb — Just Like With Hilton NOVEMBER 2, 2015

Theranos' Elizabeth Holmes Says The Company Will "absolutely" Get FDA Approval NOVEMBER 2, 2015

Activision Acquires Candy Crush Maker King Digital For \$5.9 Billion

by Mathew Ingram @mathewi NOVEMBER 3, 2015, 12:34 AM EST

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Use Your AmEx Points to Book on Airbnb — Just Like With Hilton NOVEMBER 2, 2015

Theranos' Elizabeth Holmes Says The Company Will "absolutely" Get FDA Approval NOVEMBER 2, 2015

Activision's purchase price for the game maker is a premium to its current price but a discount to its recent IPO price.

King Digital Entertainment, the company behind popular Facebook games such as Candy Crush, seems to have decided that being a publicly-traded entity isn't all it's cracked up to be. King announced late Monday that it is being acquired by Activision Blizzard, the maker of popular console and PC games such as Call of Duty, for \$5.9 billion.

The purchase price of \$18 a share amounts to a premium of about 16% over the recent closing price for King's stock (**KING** + 19.32%) — but it's about 20% lower than the price at which the company went public 18 months ago. At that

Is Candy Crush over? Photo: Andrew Harrer — Bloomberg/Getty Images

MORE

Why Activision Spent \$5.9 Billion on "Candy Crush" Creator King Digital

Why Activision-Blizzard just launched a new eSports division

7 signs America has gone crazy for 'The Walking Dead'

Checkout Page

Conversion rate is percentage of visits that include purchase

A

Doctor FootCare™

Home | Products | Learn More | Tips | Testimonials | FAQ | About Us | Contact Us 1-866-211-9733

Shop With Confidence

Satisfaction Guaranteed 30-day, hassle-free Returns

100% Safe, **Secured** shopping We assure your Privacy

100% Secured Checkout

Continue Shopping > Proceed To Checkout

Item Name	Item Number	Quantity	Remove	Unit Price	Subtotal
Trial Kit	FFCS	1		\$0.00	\$0.00

Total: \$0.00

Select Shipping Method Standard (\$5.95)

Continue Shopping > Proceed To Checkout

B

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> Proceed To Checkout

Item Name	Item Number	Quantity	Remove	Unit Price	Subtotal
Trial Kit	FFCS	1		\$0.00	\$0.00

Discount: \$0.00

Total: \$0.00

Enter Coupon Code

Select Shipping Method Standard (\$5.95)

Recalculate Continue Shopping > Proceed To Checkout

Which version has a higher conversion rate?

Example from Bryan Eisenberg's article on clickz.com

Checkout Page

Conversion rate is percentage of visits that include purchase

A

This screenshot shows the Doctor FootCare website's checkout process. At the top, there's a navigation bar with links to Home, Products, Learn More, Tips, Testimonials, FAQ, About Us, Contact Us, and a phone number 1-866-211-9733. Below the navigation is a section titled "Shop With Confidence" containing four checked checkboxes: Satisfaction Guaranteed, 30-day, hassle-free Returns, 100% Safe, Secured shopping, and We assure your Privacy. A yellow "100% Secured Checkout" button is visible. In the center, there's a table for a "Trial Kit" with columns for Item Name, Item Number, Quantity, Remove, Unit Price, and Subtotal. The quantity is set to 1, unit price is \$0.00, and subtotal is \$0.00. An "Update" button is below the table. To the right of the table are two buttons: "Continue Shopping" and a yellow "Proceed To Checkout" button. At the bottom of the page, there's another "100% Secured Checkout" button, followed by a "Recalculate" button, a "Continue Shopping" button, and a yellow "Proceed To Checkout" button. The bottom navigation bar includes links for Home, Products, Learn More, Tips, Testimonials, FAQ, About Us, Contact Us, and Shopping Cart. A copyright notice at the very bottom states: "Copyright © 2002 Doctor Foot Care Inc. All Rights Reserved. [Privacy Policy](#)".

B

This screenshot shows the Doctor FootCare website's checkout process, similar to Version A but with several changes highlighted by red circles. At the top, the navigation bar and "Shop With Confidence" section are identical. The "100% Secured Checkout" button is present. In the center, the table for the "Trial Kit" shows the same data as Version A. The "Update" button is circled. To the right, the "Proceed To Checkout" button is circled. At the bottom, the "Recalculate" button is circled. The bottom navigation bar and copyright notice are also identical to Version A.

Which version has a higher conversion rate?

Example from Bryan Eisenberg's article on clickz.com

Checkout Page

Conversion rate is percentage of visits that include purchase

A

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Shop With Confidence

Satisfaction Guaranteed 30-day, hassle-free Returns

100% Safe, **Secured** shopping We assure your Privacy

100% Secured Checkout

Continue Shopping > Proceed To Checkout

Item Name	Item Number	Quantity	Remove	Unit Price	Subtotal
Trial Kit	FFCS	1		\$0.00	\$0.00

Total: \$0.00

Select Shipping Method Standard (\$5.95)

100% Secured Checkout

Continue Shopping > Proceed To Checkout

Home | Products | Learn More | Tips | Testimonials | FAQ | About Us | Contact Us | Shopping Cart

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Shop With Confidence

Satisfaction Guaranteed 30-day, hassle-free Returns

100% Safe, **Secured** shopping We assure your Privacy

100% Secured Checkout

> Proceed To Checkout

Item Name	Item Number	Quantity	Remove	Unit Price	Subtotal
Trial Kit	FFCS	1		\$0.00	\$0.00

Discount: \$0.00

Enter Coupon Code:

Select Shipping Method Standard (\$5.95)

100% Secured Checkout

Recalculate Continue Shopping > Proceed To Checkout

Home | Products | Learn More | Tips | Testimonials | FAQ | About Us | Contact Us | Shopping Cart

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Coupon Code decreases by factor of 10

Office Online Feedback

A

Please let us know if this content was helpful.

Rate this content:



Tell us why you rated the content this way (optional):

Remaining characters: 650

Submit

B

How helpful was this information?

Click a star.

Not
helpful



Very
helpful

Click to rate: 3 out of 5 stars

How helpful was this information?

Click a star.

Not
helpful



Very
helpful

Why did you rate the information this way?

Remaining characters: 650

Submit

Feedback A puts everything together, whereas feedback B is two-stage: question follows rating.

Feedback A just has 5 stars, whereas B annotates the stars with “Not helpful” to “Very helpful” and makes them brighter.

Which one has a higher response rate? By how much?

Office Online Feedback

A

Please let us know if this content was helpful.

Rate this content:



Tell us why you rated the content this way (optional):

Remaining characters: 650

B

How helpful was this information?

Click a star.

Not
helpful



Very
helpful

How helpful was this information?

Click a star.

Not
helpful



Very
helpful

Why did you rate the information this way?

Remaining characters: 650

Feedback A puts everything together, whereas feedback B is two-stage: question follows rating.

Feedback A just has 5 stars, whereas B annotates the stars with “Not helpful” to “Very helpful” and makes them brighter.

Which one has a higher response rate? By how much?

B gets more than double response rate.

Another Feedback Variant

Call this variant C. Like B, also two-stage.

Which one has a higher response rate, B or C?

C

Was this information helpful?

Yes No I don't know

How was this information helpful?

What are you trying to do?

How can we make this information more helpful?

```
graph TD; A[Was this information helpful?] --> B[How was this information helpful?]; A --> C[What are you trying to do?]; A --> D[How can we make this information more helpful?]; B --> E[Back]; C --> F[Submit]; D --> G[Back]; D --> H[Submit];
```

Another Feedback Variant

Call this variant C. Like B, also two-stage.

Which one has a higher response rate, B or C?

C

Was this information helpful?

Yes No I don't know

How was this information helpful?

What are you trying to do?

How can we make this information more helpful?

Back Submit

Back Submit

Back Submit

C outperforms B by a factor of 3.5

Office Online

Clicks on revenue generating links (red links)

A

Online Build Ver: 12.0.5572.1000

Welcome to Office Online

Products Help and How-to Downloads Clip Art Templates Microsoft Office Live

Search

Read the Inside Office Online blog

Make your own help video

Check for updates

Community Clips

Office Updates

Today on Office Online

Get out of town! Find out how Office makes travel easy

Check out our tips and templates for planning a smooth business trip, or perfect holiday.

Free travel templates

Business trip itinerary with meeting details

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MICROSOFT

B

Office Online

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Office Online

Clicks on revenue generating links (red links)

A

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Read the Inside Office Online blog Make your own help video Check for updates

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Check out our tips and templates for planning a smooth business trip, or perfect holiday.

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MICROSOFT

B

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MICROSOFT

A gets many more clicks

Office Online

Clicks on revenue generating links (red below)

A

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Read the Inside Office Online blog Make your own help video Check for updates

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Home and school At home At work At school

Work At work Small business

Community Share your templates Get help from others

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TOP SEARCHES

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Word Excel PowerPoint OneNote

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MICROSOFT

B gets more revenue

Examples Where Data Is Wrong

If something is “amazing,” find the flaw!

If you have a mandatory birth date field,
and people think it’s unnecessary,
you will find lots of 11/11/11 or 01/01/01

If you have an optional drop down,
do not default to the first alphabetical entry,
or you will have lots of: jobs = Astronaut

Traffic to doubled between 1-2am Nov 6, 2011 for
many web sites, relative to same hour week prior

MSN US Home Page

Proposal: New Offers module below Shopping

Shopping

- Lancôme: Free deluxe compact w/ purchase
- Special promotions at your favorite stores
- Warm fall fashion styles are here
- Save on top brand digital cameras
- Free shipping on furniture for every room

Advertisements

**A smart way to buy a diamond**

- Wal-Mart: Back-to-school
- Our editor picks budget electronics
- Get fit & save money: Sports sale

Control

Shopping

- Lancôme: Free deluxe compact w/ purchase
- Special promotions at your favorite stores
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- Save on top brand digital cameras
- Free shipping on furniture for every room

Advertisements

**A smart way to buy a diamond**

- Wal-Mart: Back-to-school
- Our editor picks budget electronics
- Get fit & save money: Sports sale

Offers

**Search GM Certified**

With our 117-Point Inspection
GM Certified means no worries

**Online University**

Earn degree from a top school
100% Online. Get Free Info!

**\$200k Loan, Get Low Rates**

Secure Financing and Increase
Cash Flow. Click Here Now!

Treatment

Experiment Results

Ran A/B test for 12 days on 5% of MSN US visitors

Experiment Results

Ran A/B test for 12 days on 5% of MSN US visitors

Clickthrough:

Page views per person-day:

Experiment Results

Ran A/B test for 12 days on 5% of MSN US visitors

Clickthrough: decreased 0.49%

Page views per person-day: decreased 0.35%

Experiment Results

Ran A/B test for 12 days on 5% of MSN US visitors

Clickthrough: decreased 0.49%

Page views per person-day: decreased 0.35%

Value of click from home page: X cents

Net = Expected Revenue –

Value Per Click * Direct lost clicks –

Value Per Click * Lost Due to Decreased Views

Experiment Results

Ran A/B test for 12 days on 5% of MSN US visitors

Clickthrough: decreased 0.49%

Page views per person-day: decreased 0.35%

Value of click from home page: X cents

Net = Expected Revenue –

Value Per Click * Direct lost clicks –

Value Per Click * Lost Due to Decreased Views

Net was negative (in millions of dollars),
offers module did not launch

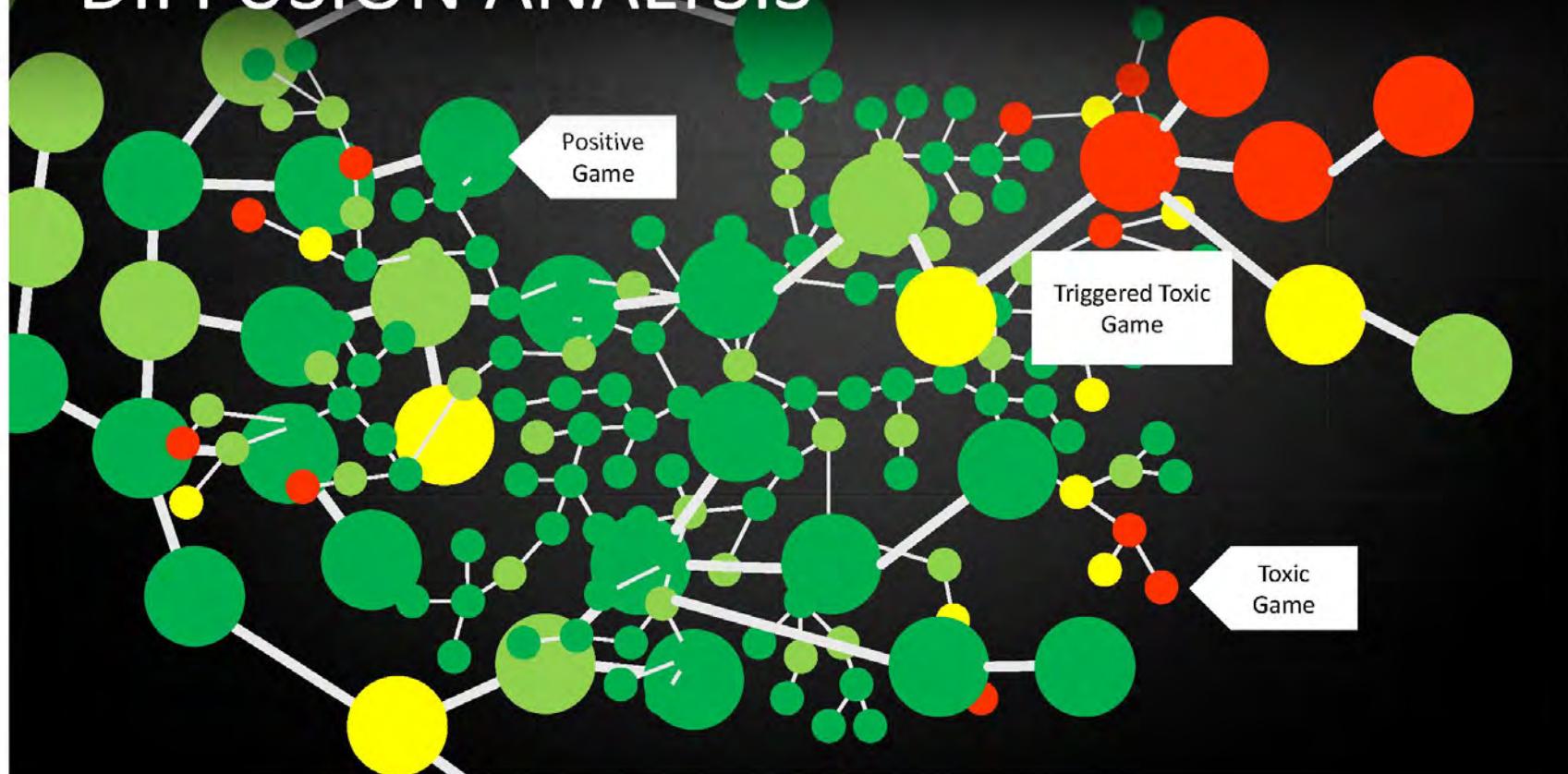
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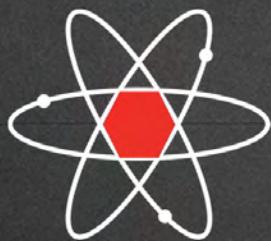
AS THE FUTURE OF RESEARCH



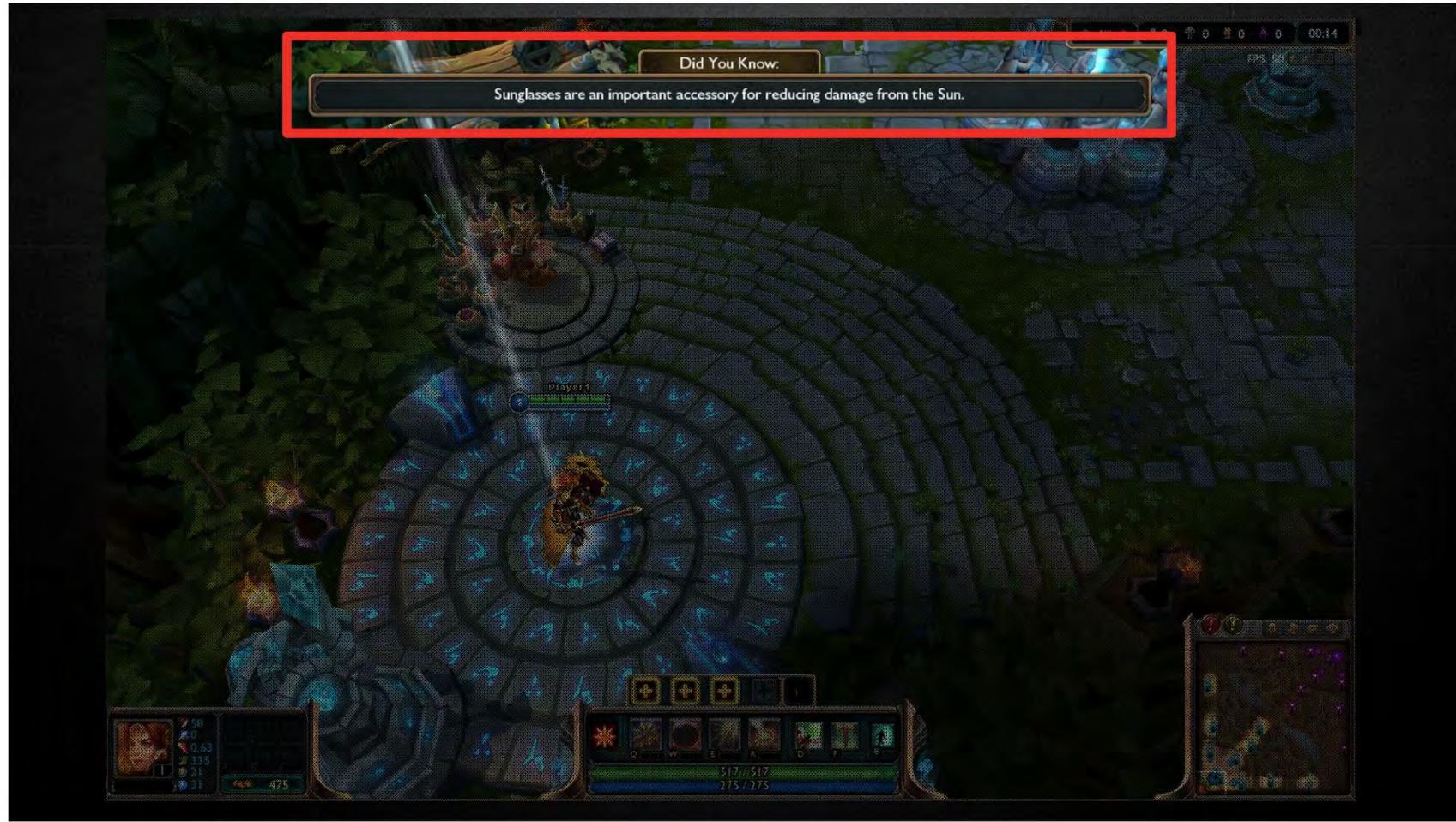
JEFFREY “LYTE” LIN
jlin@riotgames.com | @RiotLyte

DIFFUSION ANALYSIS





OPTIMUS PRIME EXPERIMENT



OPTIMUS PRIME

EXPERIMENTAL DESIGN

C1

CATEGORY 1: FUN FACTS

“Nautilus’ /joke makes him swim through air. He’s weird like that.”

OPTIMUS PRIME

EXPERIMENTAL DESIGN

C1

C2

CATEGORY 2:

POSITIVE BEHAVIOR

“Players perform better if you give them constructive feedback after a mistake.”

OPTIMUS PRIME

EXPERIMENTAL DESIGN

C1

C2

C3

CATEGORY 3:

NEGATIVE BEHAVIOR

“Players who verbally abuse their teammates lose 16% more games.”

OPTIMUS PRIME

EXPERIMENTAL DESIGN



CATEGORY 4:

SELF-REFLECTION

“Who will be the most sportsmanlike player in this game?”

OPTIMUS PRIME

EXPERIMENTAL DESIGN

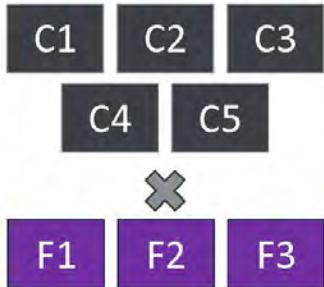


CATEGORY 5: GAMEPLAY TIPS

“Hold down the ALT key while casting an ability to cast it on yourself.”

OPTIMUS PRIME

EXPERIMENTAL DESIGN



FONT COLORS

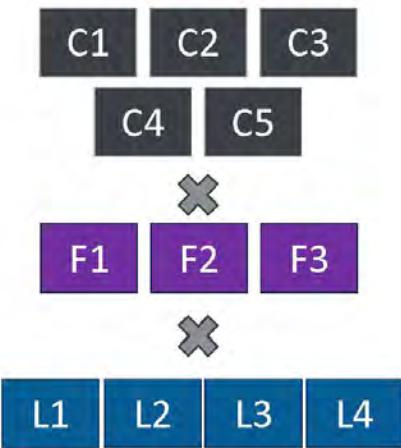
Font Color 1 | Red

Font Color 2 | Blue

Font Color 3 | White (Control)

OPTIMUS PRIME

EXPERIMENTAL DESIGN

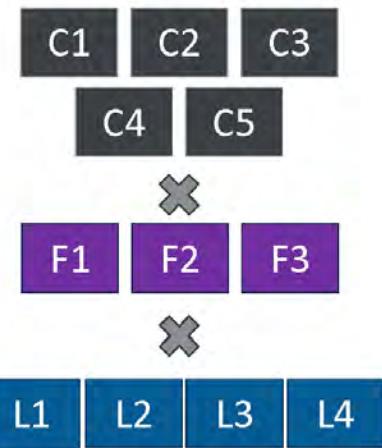


LOCATIONS

- LOCATION 1: Loading Screen
- LOCATION 2: In-Game
- LOCATION 3: Both
- LOCATION 4: None (Control)

OPTIMUS PRIME

EXPERIMENTAL DESIGN



COMPLETE EXPERIMENTAL DESIGN:

24 TIPS ACROSS 5 CATEGORIES



3 FONT COLORS



3 LOCATIONS + 1 OVERALL CONTROL



217 UNIQUE CONDITIONS

**EVERY GAME OF *LEAGUE OF LEGENDS* GOT A
RANDOM TIP, LOCATION & FONT COLOR**
(10% OF GAMES GOT NOTHING TO ACT AS CONTROLS)

OPTIMUS PRIME RESULTS

TIP: “X% of players punished by the Tribunal improve their behavior and are never punished again”

FONT: White

LOCATION: Loading Screen



*Optimus data from 11/2012

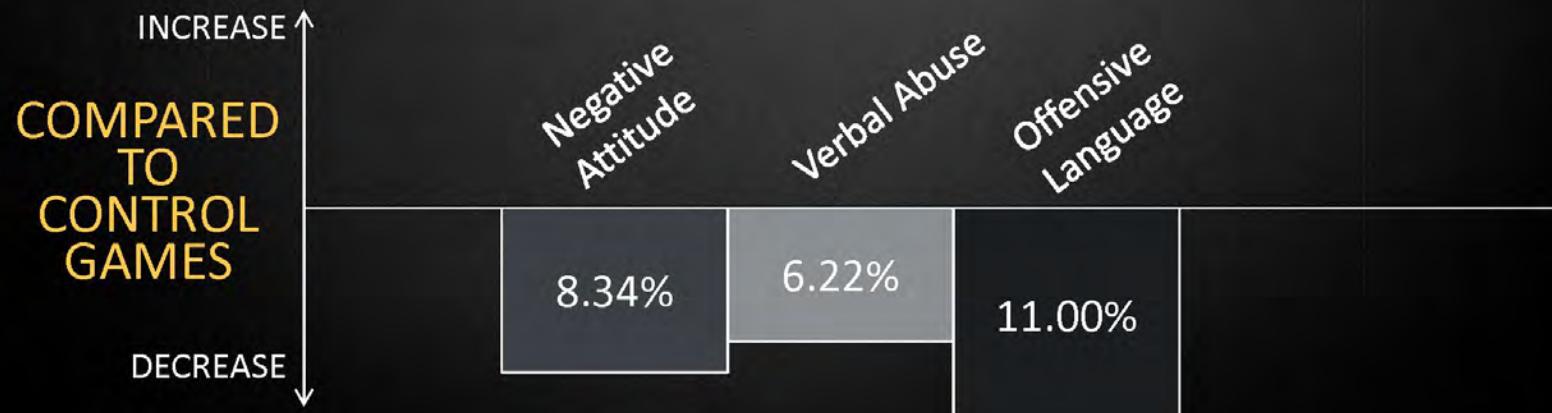
HOW DO **FONT COLORS** INTERACT
WITH TIP CATEGORIES?

OPTIMUS PRIME RESULTS

TIP: “Teammates perform worse if you harass them after a mistake.”

FONT: Red

LOCATION: Loading Screen



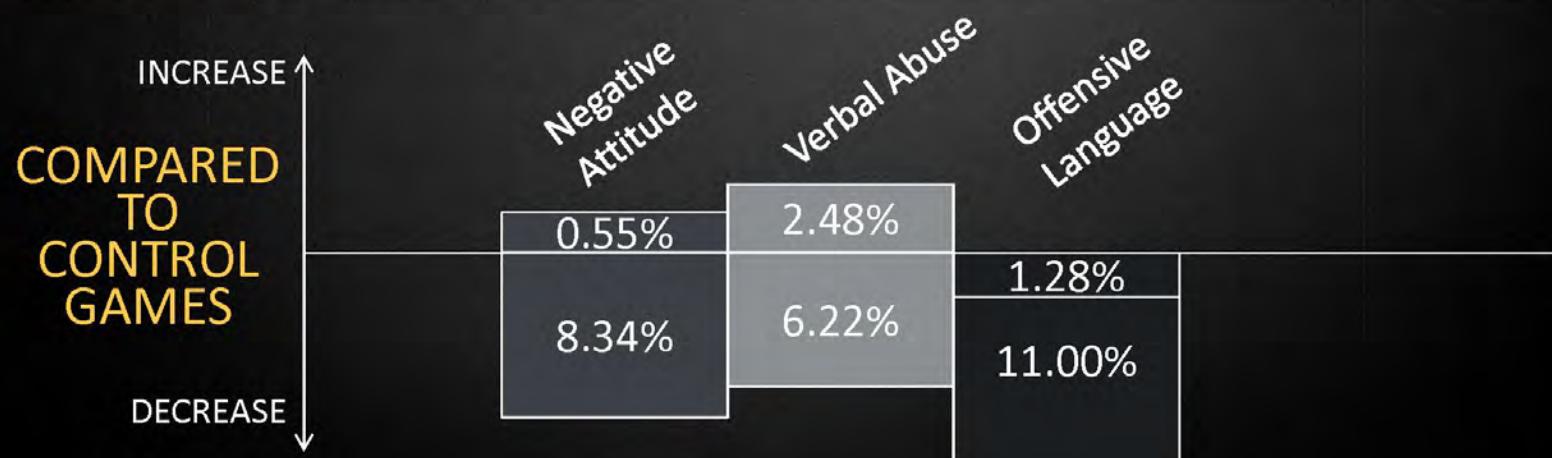
*Optimus data from 11/2012

OPTIMUS PRIME RESULTS

TIP: “Teammates perform worse if you harass them after a mistake.”

FONT: White

LOCATION: Loading Screen



*Optimus data from 11/2012

OPTIMUS PRIME RESULTS

TIP: “Players who cooperate with their teammates win X% more games.”

FONT: Blue

LOCATION: Loading Screen



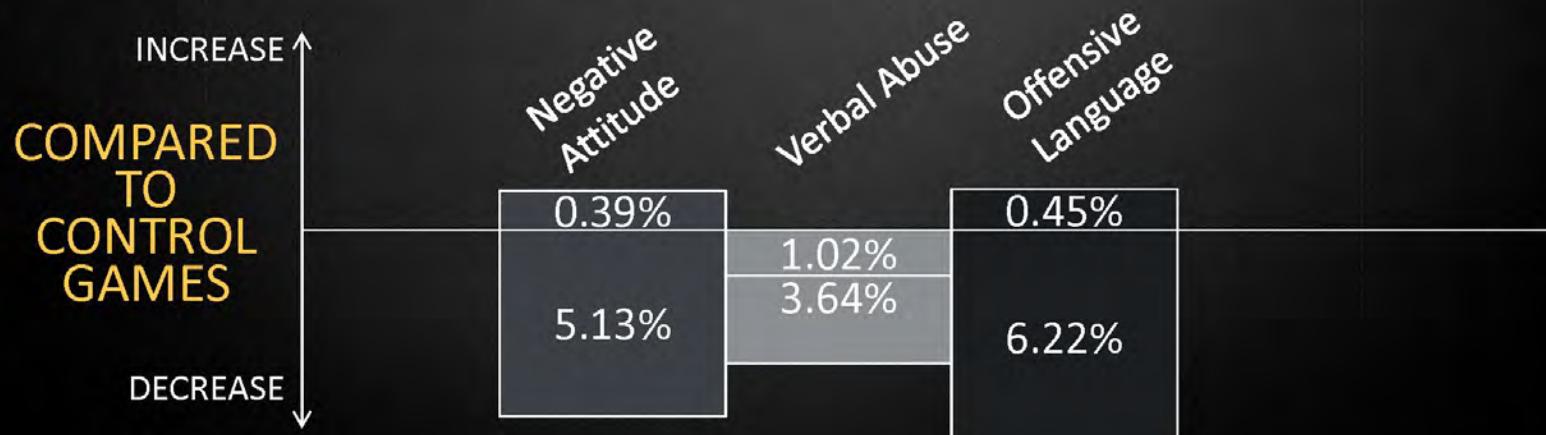
*Optimus data from 11/2012

OPTIMUS PRIME RESULTS

TIP: “Players who cooperate with their teammates win X% more games.”

FONT: Red

LOCATION: Loading Screen



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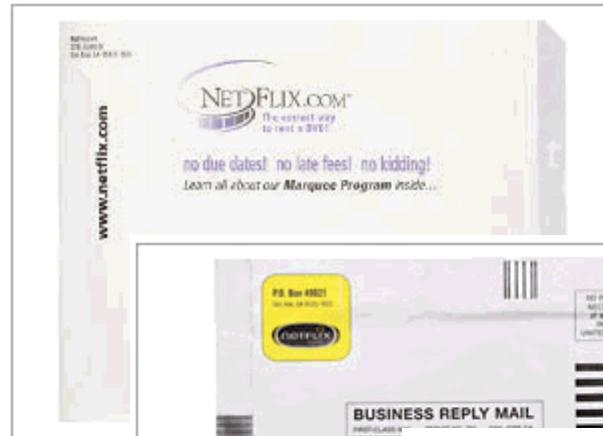
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Data Driven Methods Not Just Online

[◀ PREVIOUS](#)[NEXT ▶](#)[Back to story](#)**1999**

Made from cardboard, the first Netflix mailer weighs more than an ounce. But with only 100,000 customers, reducing material and shipping costs is not yet a priority for the company.

[◀ PREVIOUS](#)[NEXT ▶](#)[Back to story](#)**2000**

Thick paper replaces cardboard. DVDs are inserted and removed from the top rather than the side.

[◀ PREVIOUS](#)[NEXT ▶](#)[Back to story](#)**2000**

Full-color printing is introduced. Top-loading is abandoned in favor of side-loading, which is judged more convenient.

[NEXT ▶▶](#)

Data Driven Methods Not Just Online



[PREVIOUS](#)

[NEXT](#)

[Back to story](#)

2000

Customers are asked to peel off a sticker to reveal Netflix's return address. The design is eventually deemed too complex.



[PREVIOUS](#)

[NEXT](#)

[Back to story](#)

2000

Made from plastic instead of paper, this mailer is cheaper, but it sometimes inflates when transported on airplanes.



[PREVIOUS](#)

[NEXT](#)

[Back to story](#)

2001

An airhole (the black dot on the left side of the mailer) is added to prevent the package from inflating.



[PREVIOUS](#)

[NEXT](#)

[Back to story](#)

2001

Netflix returns to paper because it's easier to recycle. Foam padding is added to reduce breakage.

[NEXT»](#)

NUCCI STUDIO

Data Driven Methods Not Just Online

The image displays four sequential prototypes of Netflix mailers, each with a red background and the word "NETFLIX" printed on it. The prototypes illustrate a progression in design:

- 2001:** Shows a top-loading slot with a red flap. The text "Foam padding is dropped because the benefits don't justify the cost. The company gives top-loading another try." is present.
- 2001:** Shows a side-loading slot with a red flap. The text "Marking a return to side-loading, this mailer is a direct ancestor of the one the company uses today." is present.
- 2003:** Shows a circular white seal at the top edge. The text "Instead of sealing the entire top and bottom, Netflix introduces a circular sticker, affixed only on the top." is present.
- 2004:** Shows a rectangular window at the top edge. The text "A window shows the disc bar code. Speculation is that this enables storing discs in mailers prior to shipping." is present.

Each prototype includes navigation buttons ("PREVIOUS", "NEXT", "Back to story") and a credit line "NUCCI STUDIO" at the bottom right of the fourth prototype.

Limitations of Data Driven Testing

Drives hill-climbing, but not overall design

A design may be better, but is it good?

Impossible for new designs to compete

Can be difficult to scale to many features

Now we step through a larger example

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Weezer (2001)

[Weezer](#)**Our best price: \$6.99**

List Price: \$18.97 (Save: \$11.98)

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Actual items for sale may vary from this image.

Product Highlights

CD

May 2001

List Price: **\$18.97**28 minutes
UPC 606949-30452-2
Geffen Records
Catalog 493 045Standard shipping ([USPS Media Mail](#)) for this item is \$2.30.[Like New](#)Sorted by **Price**

74 items in stock

Price	Total Price	Seller (Rating)	Seller Comments	
\$7.75 	\$10.20 Media Mail	custodian46 (149) 	best buy	More info...
\$8.00 	\$10.45 Media Mail	stargaze13 (3) 	Disk, case, and liner all in excellent c more...	More info...
\$8.25 	\$10.70 Media Mail	dazzyliz (1205) 	SEALED NEW BMG	More info...
\$8.30 	\$10.75 Media Mail	naojia@hotmail.com (35) 	Perfect condition	More info...

» [View all Like New Items](#)[Very Good](#)Sorted by **Price**

17 items in stock

Price	Total Price	Seller (Rating)	Seller Comments	
\$8.00 	\$10.45 Media Mail	lucidsky (14) 	perfect	More info...
\$8.84 	\$11.29 Media Mail	steveeq1 (82) 		More info...
\$9.00 	\$11.45 Media Mail	saint.timothy (18) 	Great shape...first class ship	More info...

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3 Place Order

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Media Mail: \$2.45

Subtotal: \$10.75

Total Merchandise: \$8.30

Total Shipping: \$2.45

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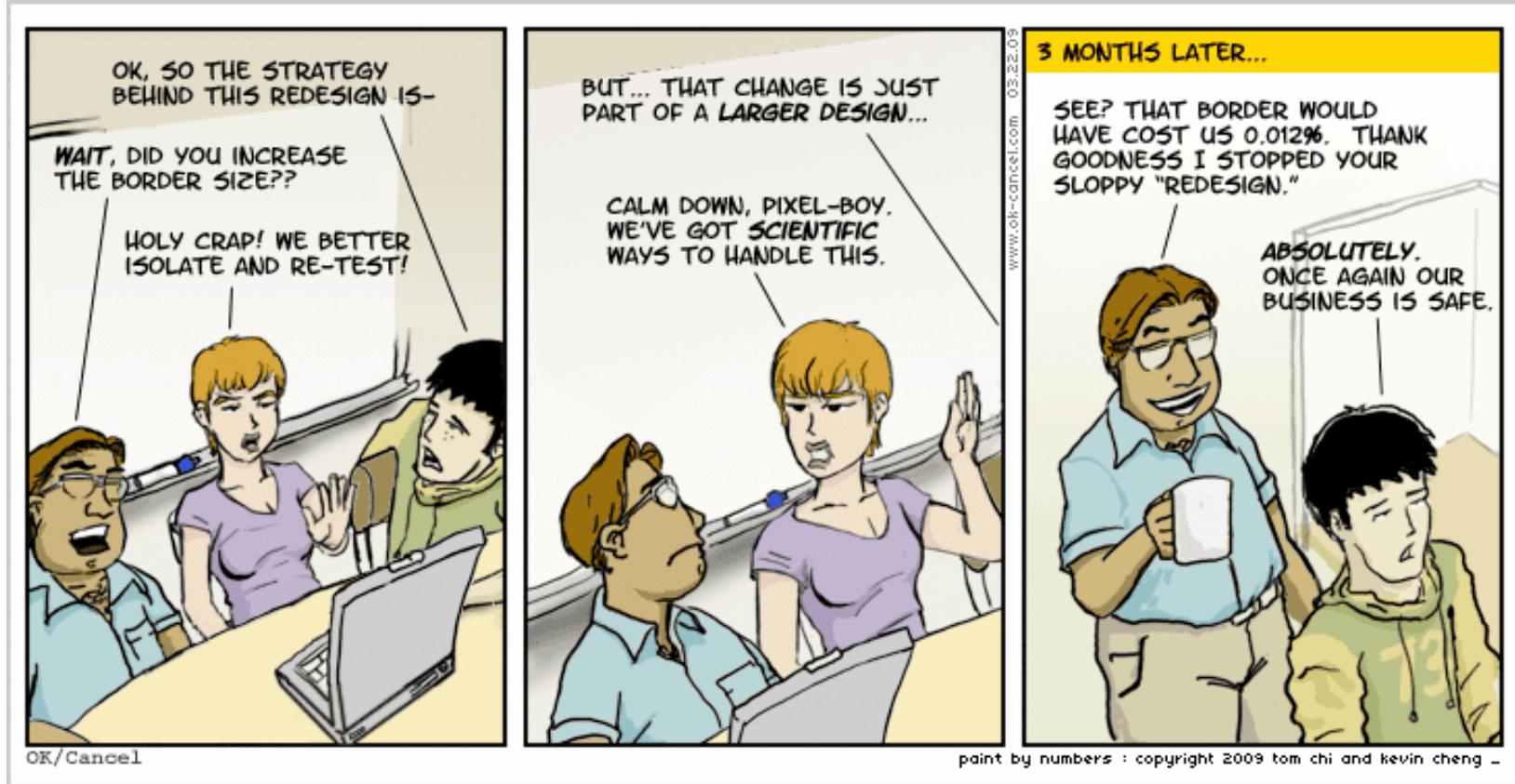
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Testing in a Larger Design



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Goodbye, Google

20 March 2009 design google

Part 1 of 2 (here's Part 2)

Today is my last day at Google.

I started working in-house at Google almost three years ago. I built a team from scratch. I was fortunate to hire a team of a very talented designers. We introduced Visual Design as a discipline to Google. And we produced amazing work together. I'm very proud of my team, and I wish them well. They have a lot of challenging work ahead. But for me, it's time to move on.

Do I have something else lined up? Yes. That will be covered in Part 2. So I'm not leaving just to leave. But I'm not going to sugarcoat the reasons for my departure either. The scale at which Google operates was an early attractor for me. Potential to impact millions of people? Where do I sign? Unfortunately for me, there was one small problem I didn't see back then.

When I joined Google as its first visual designer, the company was already seven years old. Seven years is a long time to run a company without a classically trained designer. Google had plenty of designers on staff then, but most of them had backgrounds in CS or HCI. And none of them were in high-up, respected leadership positions. Without a person at (or near) the helm who thoroughly understands the principles and elements of Design, a company eventually runs out of reasons for design decisions. With every new design decision, critics cry foul. Without conviction, doubt creeps in. Instincts fail. "Is this the right move?" When a company is filled with engineers, it turns to engineering to solve problems. Reduce each decision to a simple logic problem. Remove all subjectivity and just look at the data. Data in your favor? Ok, launch it. Data shows negative effects? Back to the drawing board. And that data eventually becomes a crutch for every decision, paralyzing the company and preventing it from making any daring design decisions.

Yes, it's true that a team at Google couldn't decide between two blues, so they're testing 41 shades between each blue to see which one performs better. I had a recent debate over whether a border should be 3, 4 or 5 pixels wide, and was asked to prove my case. I can't operate in an environment like that. I've grown tired of debating such minuscule design decisions. There are more exciting design problems in this world to tackle.

I can't fault Google for this reliance on data. And I can't exactly point to financial failure or a shrinking number of users to prove it has done anything

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Wizard of Oz and Low Fidelity Testing

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8. Simple Pages
9. Glorious Days
10. O Girlfriend

Album Credits

Ken Allerdyce, Engineer
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Album Notes

Weezer: Rivers Cuomo (vocals, guitar); Brian Bell (guitar); Matt Sharp (bass); Patrick Wilson (drums). Recorded at Cello Studios, Los Angeles, California in December 2000. In 1994 Weezer burst onto the music scene, reaching platinum status with their debut, and in the process proving that there was still room in an airbrushed MTV world for unrepentant power pop played by decidedly non-airbrushed guys. Following a brief sojourn into semi-deconstructionism, 1997's PINKERTON, the four men who make up Weezer serve up a third offering, WEEZER 2001, returning to the sound and producer of their successful debut. Nowhere does producer Ric Ocasek define his trademark refined power pop style more than with Weezer. Unlike the immediate, obvious pop hooks of the string of singles on the first album, though, the songs on WEEZER 2001 may take a few listens to settle in. However, once the subtle-yet-undeniable refrains of such tracks as "Crab," "Don't Let Go," and first single "Hash Pipe" make their way into your skull, they're there to stay, as furious, fuzzy, layered guitars compliment Rivers Cuomo's raw, vulnerable vocals. While this disc clocks in at less than a half-hour long, it packs more hooky wallop than many double live albums.

Product Reviews**Editorial Reviews****Spin (01/01/2002)**

Ranked #9 in Spin's Albums of the Year 2001
 Ranked #13 in AP's 25 Best Albums of 2001
 beast...Rolling Stone (6/7/01, p.110) - 4 excellent tunes in less than half an hour
 Rivers Cuomo's shrink another hot tub...On the observed power pop of their '94 debut, a

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City

State

ZIP code

Country

If U.S. Military, enter APO/FPO for City.

Select State

If U.S. Military, select AE, AP or AA from bottom

Save Changes

- **Note what's different**
 - No tab rows
 - No impulse buys
 - Only navigation on page takes you to next step

- **This is a PROCESS FUNNEL**
 - Extraneous info and links removed to focus customers

 Place my order!

Order Summary

Weezer (2001) Weezer, Weezer (Music)
Seller: naojia@hotmail.com (35)
Condition: Like New • Notes: Perfect condition

Item: \$8.30

Media Mail: \$2.45

Subtotal: \$10.75

Total Merchandise: \$8.30

Total Shipping: \$2.45

TOTAL: \$10.75

Ship to

Jason Hong
387 Soda Hall Computer Science UC Berkeley
Berkeley, CA 94720

[Edit / Change Shipping Address](#)

Bill to

MasterCard ending with 0155
Expires 11/2003
Zipcode: 94709

[Edit / Change Billing](#)

Use this shipping and billing information as my Speedy Checkout settings.

 Place my order!

6

Checkout

1 Shipping

2

3 Place Order

Secure
Shipping**Place my order!****Order Summary**

Weezer (2001) Weezer, Weezer (Music)
Seller: naojia@hotmail.com (35)
Condition: Like New • Notes: Perfect condition

Ship to

Jason Hong
387 Soda Hall Computer Science UC Berkeley
Berkeley, CA 94720

[Edit / Change Shipping Address](#)**Last step of process**

- Step 3, “Place Order”
- “Place my order” button

**Two HIGH-VISIBILITY ACTION
BUTTONS for fold**[Edit / Change Billing](#) Use this shipping and billing information for my future Check out settings.**Place my order!**



- **No nasty surprises**

- Can see order
- Total price is same as shopping cart
- **ORDER SUMMARY**

order!

Item: \$8.30
Media Mail: \$2.45
Subtotal: \$10.75
Total Merchandise: \$8.30
Total Shipping: \$2.45
TOTAL: \$10.75

Ship to

Jason Hong
387 Soda Hall Computer Science UC Berkeley
Berkeley, CA 94720

[Edit / Change Shipping Address](#)**Bill to**

MasterCard ending with 0155
Expires 11/2003
Zipcode: 94709

[Edit / Change Billing](#)

Use this shipping and billing information as my Speedy Checkout settings.

Place my order!



- **Easy to change shipping and billing**
- **Easy to save this info**
 - Easier to setup info in context of specific task

order!

Item: \$8.30

Media Mail: \$2.45

Subtotal: \$10.75

Total Merchandise: \$8.30

Total Shipping: \$2.45

TOTAL: \$10.75**Ship to**

Jason Hong
387 Soda Hall Computer Science UC Berkeley
Berkeley, CA 94720

[Edit / Change Shipping Address](#)**Bill to**

MasterCard ending with 0155
Expires 11/2003
Zipcode: 94720

[Edit / Change Billing](#) Use this shipping and billing information as my Speedy Checkout settings.**Place my order!**

Design Equals Solutions

Design is about finding solutions

Designers often reinvent

Hard to know how things were done before

Why things were done a certain way

How to reuse solutions

One option is patterns

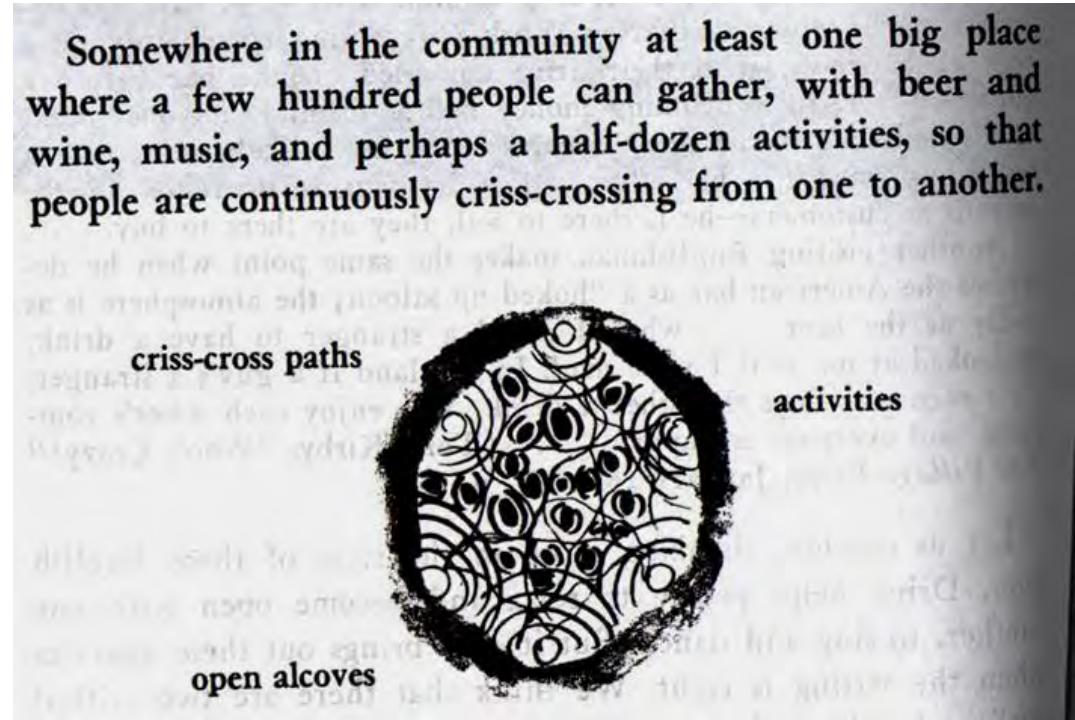
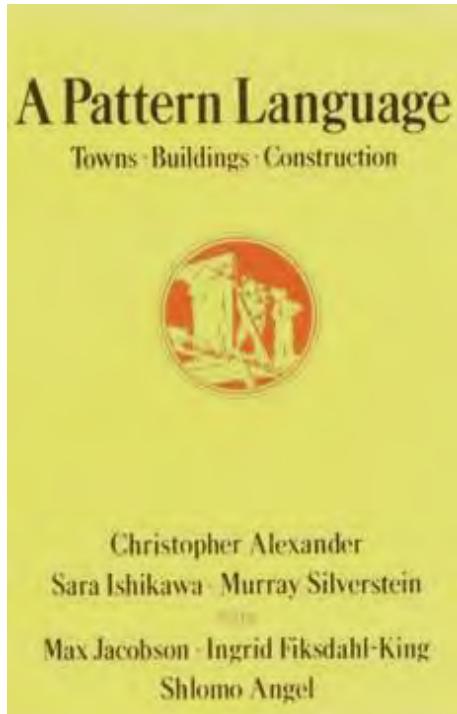
But this is also why we point you at research

Design Patterns

Design patterns communicate common design problems and solutions

First used in architecture [Alexander]

How to create a beer hall where people socialize?



Design Patterns

Somewhere in the community at least one big place where a few hundred people can gather, with beer and wine, music, and perhaps a half-dozen activities, so that people are continuously criss-crossing from one to another.

criss-cross paths



activities

open alcoves

Using Design Patterns

Not too general and not too specific

use a solution “a million times over,
without ever doing it the same way twice”

Design patterns are a shared language

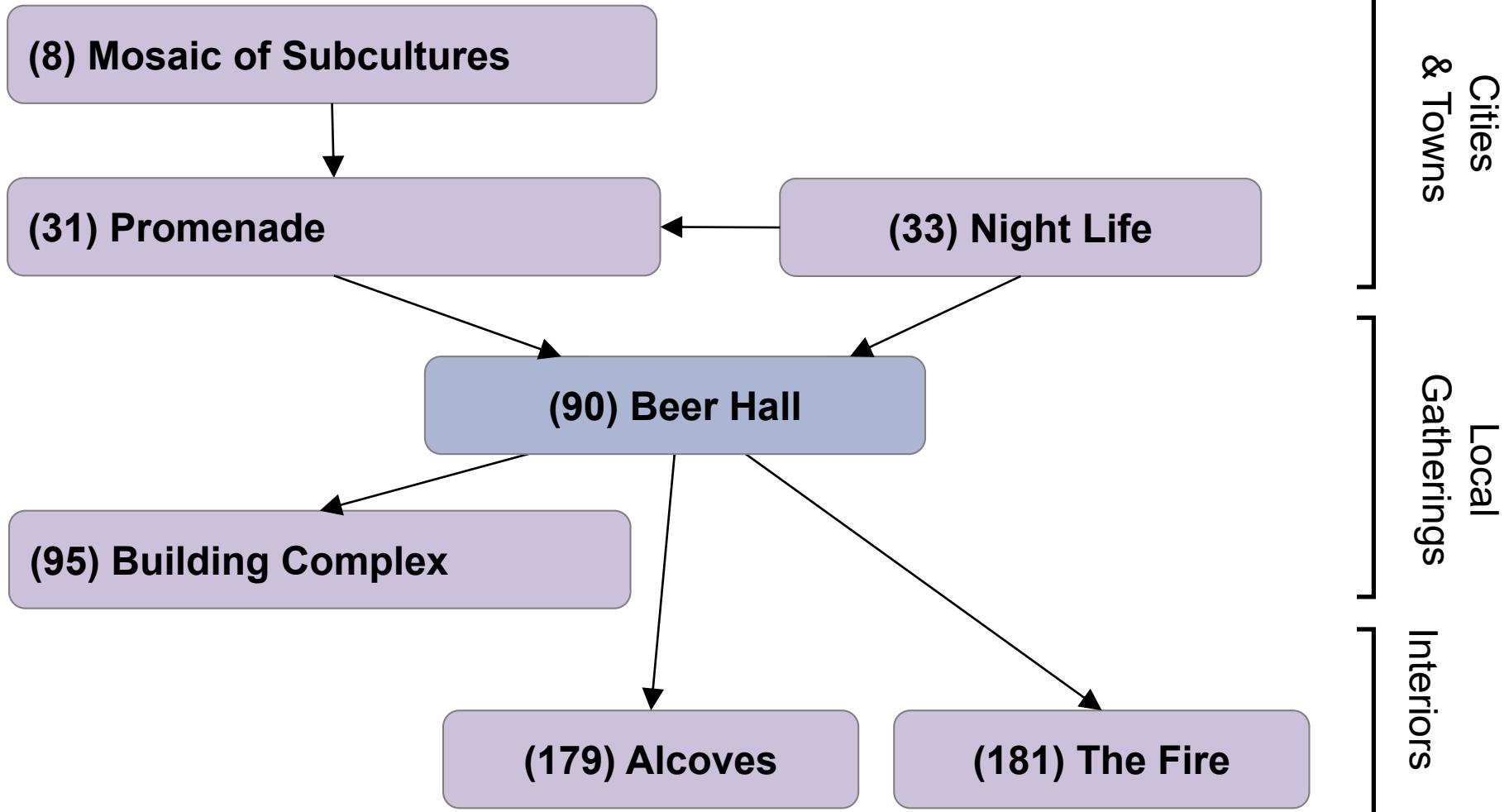
for “building and planning towns,
neighborhoods, houses, gardens, and rooms”

Beer hall is part of a center for public life

Beer hall needs spaces for groups to be alone

ALCOVES

A Web of Design Patterns



Web Design Patterns

Communicate design
problems & solutions

how to create navigation bars
for finding relevant content

how to create a shopping cart
that supports check out

how to make e-commerce sites
where people return & buy



NAVIGATION BAR (K2)

Problem: Customers need a structured, organized way of finding the most important parts of your Web site

The image displays three examples of navigation bars from different websites, each enclosed in a red rectangular border:

- Group for User Interface Research:** A dark brown header bar with the organization's name on the left and five menu items on the right: Home, Projects, People, Publications, and Links.
- DENIM and SILK:** A light gray sidebar on the left containing links for DENIM and SILK, Download, Documentation, Support, Research, Publications, and More Projects. The main content area features the text "DENIM and SILK" and a cartoon illustration of a notepad labeled "SILK".
- IBM:** A blue header bar with the IBM logo and the text "United States". Below it is a navigation menu with links: Home, Products & services, Support & downloads, and My account. A dropdown menu titled "Select a country" is open, showing options like Industries, Home / home office, Small business, Medium business, Government, and Education. The main content area features a laptop image and the slogan "Buy today, ship today".

NAVIGATION BAR (K2)

Solution diagram

Captures essence on how to solve problem



Pattern Groups

Patterns organized by group

- | | | | |
|---|------------------------|---|-----------------------|
| A | Site genres | G | Advanced ecommerce |
| B | Navigational framework | H | Completing tasks |
| C | Home page | I | Page layouts |
| D | Content management | J | Search |
| E | Trust and credibility | K | Page-level navigation |
| F | Basic ecommerce | L | Speed |
| | | M | The mobile web |

PROCESS FUNNEL (H1)

Problem:

Need a way to help people complete highly specific stepwise tasks

Ex. Create a new account

Ex. Fill out survey forms

Ex. Check out

PROCESS FUNNEL (H1)

NEW: Counting Crows: Hard Candy \$11.88 Save 37%!

my account  help  sign in

Home Books Music DVDs/Movies Video Games Computers & Software Electronics Everything Else...

Gift Certificates Wish List Pre-Orders Sell Your Stuff New Users

Search: All Categories

People with similar tastes also enjoyed...


[Weezer \(1994\)](#)
(CD, 1994)
Weezer
\$5.00
(Save \$6.97)


[Pinkerton](#)
(CD, 1996)
Weezer
\$6.00
(Save \$10.95)


[All Killer No Filler \(ECD\)](#)
(CD, 2001)

[Redeeming a Gift Certificate or Coupon?](#)

[Proceed to Checkout](#) 
[Speedy Checkout](#)

Shopping Cart

Weezer (2001) Weezer, Weezer (Music)
CD, Release Year: 2001
Seller: [naolisa@hotmail.com](#) (35)
Condition: Like New • Notes: Perfect condition

Move to WishList • Remove from Cart • Find another one

Item: \$8.30
Media Mail: \$2.45
([Change Shipping Method](#))

TOTAL: \$10.75

Gift Certificates and Coupons

Redeeming your Half.com Gift Certificate or Coupon is easy. Just enter your Claim Code in the box to the right and click "Redeem".

[Redeem](#)

[Proceed to Checkout](#) 
[Speedy Checkout](#)

PROCES

- What's different?

- No tab rows
- No impulse buys
- Only navigation on page takes you to next step

The screenshot shows a web browser displaying the half.com website's checkout process. The URL in the address bar is <http://www.half.com/checkout/step1>. The page title is "Checkout". The navigation bar at the top includes "Step 1 Shipping", "Step 2", "Step 3", and "Secure Shopping".
Step 1 - Choose Shipping Address
Ship my order to:
Jason Hong
387 Soda Hall Computer Science UC Berkeley
Berkeley, CA 94720 Use This Address
OR
Enter a new shipping address:
Name
Street address
City
State If U.S. Military, enter APO/FPO for City.
ZIP code
Country USA

- What's the same?

- Logo, layout, color, fonts

PROCESS FUNNEL (H1)

Problem:

What if users need extra help?

PROCESS FUNNEL (H1)

Dell.com | About Dell | Contact | Search | Support | Order Status | My Cart | HOME & HOME OFFICE

DELL | Computers | Software & Accessories | Service & Support | Learning Center

Buy Online or Call
1-800-915-3355

Purchase Assistance

- Payment Solutions
- Tax & Shipping Info
- Secure Shopping Guarantee
- Privacy Policy

Recommended Systems

Click here for more Dimension 4100 recommended systems.

FEATURED SYSTEM

Featured Dimension 4100



The Dimension 4100 desktop offers you amazing power and flexibility at a price that won't break your budget.

- Intel® Pentium® III processor at 933Mhz
- 40GB⁵ Hard Drive
- 128MB SDRAM
- 32MB Nvidia GeForce2 MX 4X AGP Graphics Card

Free Ground (3-5 day) Shipping with purchase of any new Dell Home System. Offer ends 4/23/01.
[Click Here for Details.](#)

Dimension 4100 | [View - Add One Item in This System](#) | [Price](#)

Intel® Pentium® III processor at 933Mhz

\$1,199

As low as \$36⁴ /46 pmts
No payment for 90 days
(Click or scroll for details)⁴

Check any item(s) you wish to add to this system, then click Customize It.

3 Year On-Site Service | [Add](#)
With on-site service, you don't have to leave your home or ship your computer to us should you have a problem.

[More Details](#)

Customize It | E-Value Code 8W71-4100po1

Processor | [? Intel® Pentium® III processor at 933MHz](#)

Keyboard | [? QuietKey® Keyboard](#)

Keyboard | [? QuietKey® Keyboard](#)

Hard Drive | [? 40GB⁵ Ultra ATA/100 Hard Drive \(7200 RPM\)](#)

Epson Stylus Color 880 Ink Jet Printer | [Add \\$149](#)
A creative and versatile printer that features super fast print speeds.

[More Details](#)

Epson 640U Scanner | [Add](#)

CONTEXT-SENSITIVE HELP (H8)

Dell.com | About Dell | Contact | Search | Support | Order Status | My Cart

DELL HOME & HOME OFFICE

Computers Software & Accessories Service & Support Learning Center

Buy Online or Call 1-800-915-3355

Purchase Assistance

- Payment Solutions
- Tax & Shipping Info
- Secure Shopping Guarantee
- Privacy Policy

Recommended Systems

Click here for more Dimension 4100 recommended systems.

FEATURED

Featured Dimension 4100

Dimension 4100

Intel® Pentium® III processor 933Mhz

\$1,199

As low as \$36⁴/mo. pmts
No payment for 90 days
(Click or scroll for details)⁴

Customize It

E-Value Code 8V771-45p01

Processor ?

Keyboard ? QuietKey® Keyboard

User Drive ? 40GB⁵ Ultra ATA-100 Hard Drive (7200 RPM)

Keyboards - Netscape

?

LEARN MORE

Close

Keyboards Great Keyboard Choices to Suit Your Needs:

- Choose from standard-size and "space-saver" designs
- Ergonomic design for added comfort
- Hot Keys provide quick, one-touch access to frequently used programs and Web sites
- USB ports allow for quick and easy access to USB peripherals, such as digital cameras, scanners and joysticks

Dell™ Enhanced Performance Keyboard

DELL GLOSSARY

Need a definition?
Click on a term.

Keyboard Type	Dell™ QuietKey	Microsoft® Internet Keyboard, Dell Edition	Dell™ Enhanced QuietKey	Dell™ Enhanced Performance
ZOOM!	For a closer look.			
Benefits	<ul style="list-style-type: none">Quiet key responseSoft "rubberdome" touch	<ul style="list-style-type: none">10 Hot Keys for easy access to your internet and e-mailE-mail Hotkey	<ul style="list-style-type: none">3 programmable keysSoft "rubberdome"	<ul style="list-style-type: none">7 programmable keysBuilt-in 2 port USB HUB

More Details

Epson 640U Scanner Add



FLOATING WINDOWS (H6)

The screenshot shows the Netflix interface with a floating window overlay. The main menu includes 'Browse', 'Recommendations' (which is selected), 'Friends', 'Queue', and 'Buy DVDs'. Below the menu, there are links for 'Get Recommendations (636)', 'Rate Movies', and 'Movies You've Rated (210)'. The main content area is titled 'Recommendations' with the subtitle 'Movie suggestions based on your ratings'. A section for 'NEW RECOMMENDATIONS' lists two movies: 'Gladiator: Extended Edition' and 'Samurai Champloo'. The 'Gladiator: Extended Edition' entry is highlighted with a red border and a yellow starburst icon. It features a thumbnail image of Russell Crowe, five red stars, and a 'Not Interested' button. A detailed description of the movie follows, along with its cast, director, genre, and rating information. The 'Samurai Champloo' entry also includes a thumbnail, five red stars, and a 'Not Interested' button. A note at the bottom of the浮窗 states 'Recommended based on 1 rating'.

Arthine van Duyne | Your Account

Browse Recommendations Friends Queue Buy DVDs

Get Recommendations (636) Rate Movies Movies You've Rated (210)

Recommendations

Movie suggestions based on your ratings

NEW RECOMMENDATIONS

Gladiator: Extended Edition

Gladiator: Extended Edition (2000)

Fans of Gladiator's original theatrical release will appreciate this extended version of the epic Ridley Scott film, packed with 17 extra minutes of action footage and gripping dialogue. Featuring a strong supporting cast and an Oscar-winning performance from actor Russell Crowe as the dauntless Roman general Maximus, this big-budget Best Picture winner became an instant classic -- and helped elevate its leading man to icon status.

Starring: Russell Crowe, Joaquin Phoenix
Director: Ridley Scott
Genre: Action & Adventure
MPAA: R

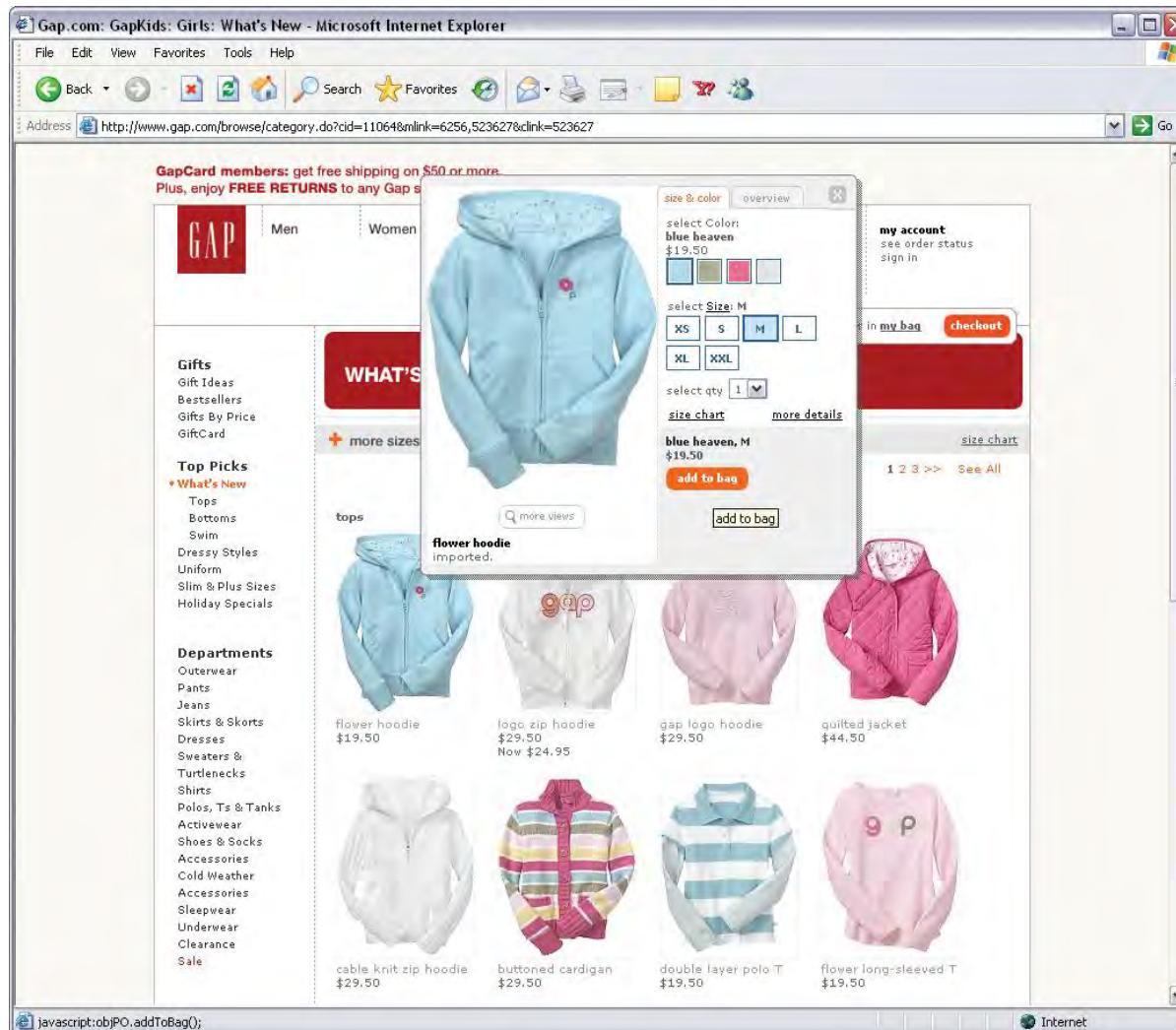
Recommended based on 1 rating

Samurai Champloo

Samurai Champloo (7 seasons)

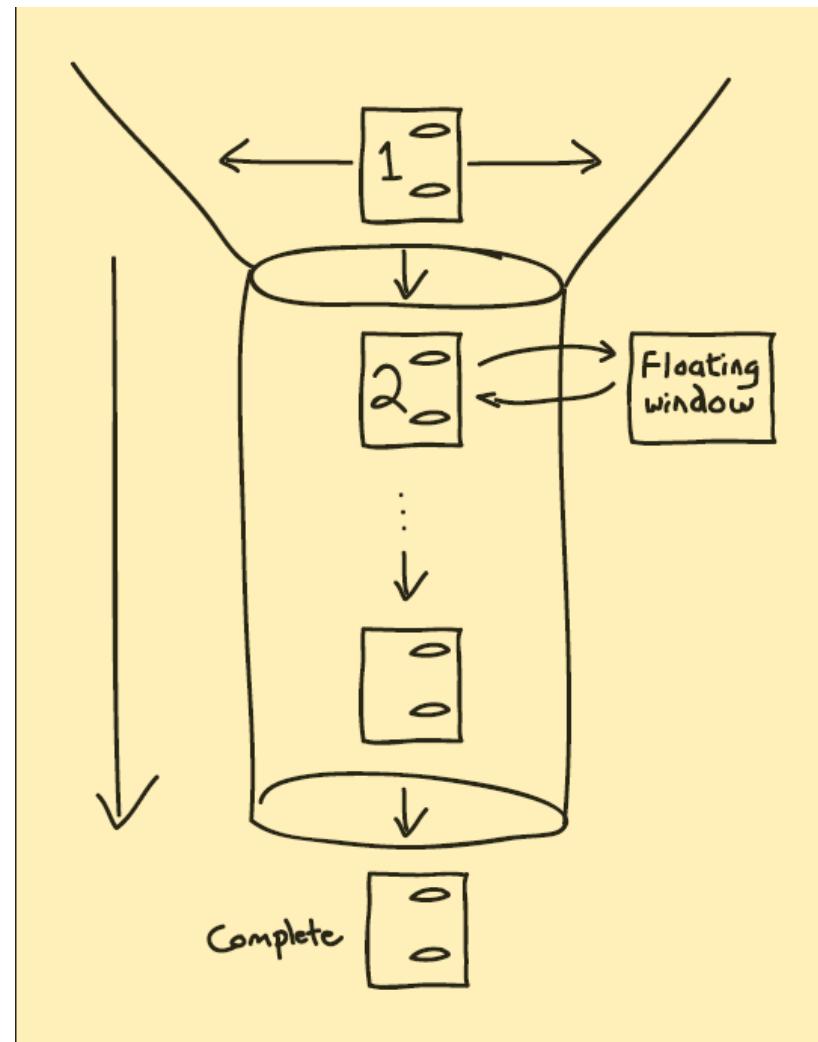
Director Shinichiro Watanabe mixes a maturity rarely found in anime with a historical Japanese setting and a funky hip-hop soundtrack. Fuu is a spacey waitress at a teahouse where a sword fight breaks out between Mugen, a wild warrior, and Jin, a ... [Read More](#)

FLOATING WINDOWS (H6)

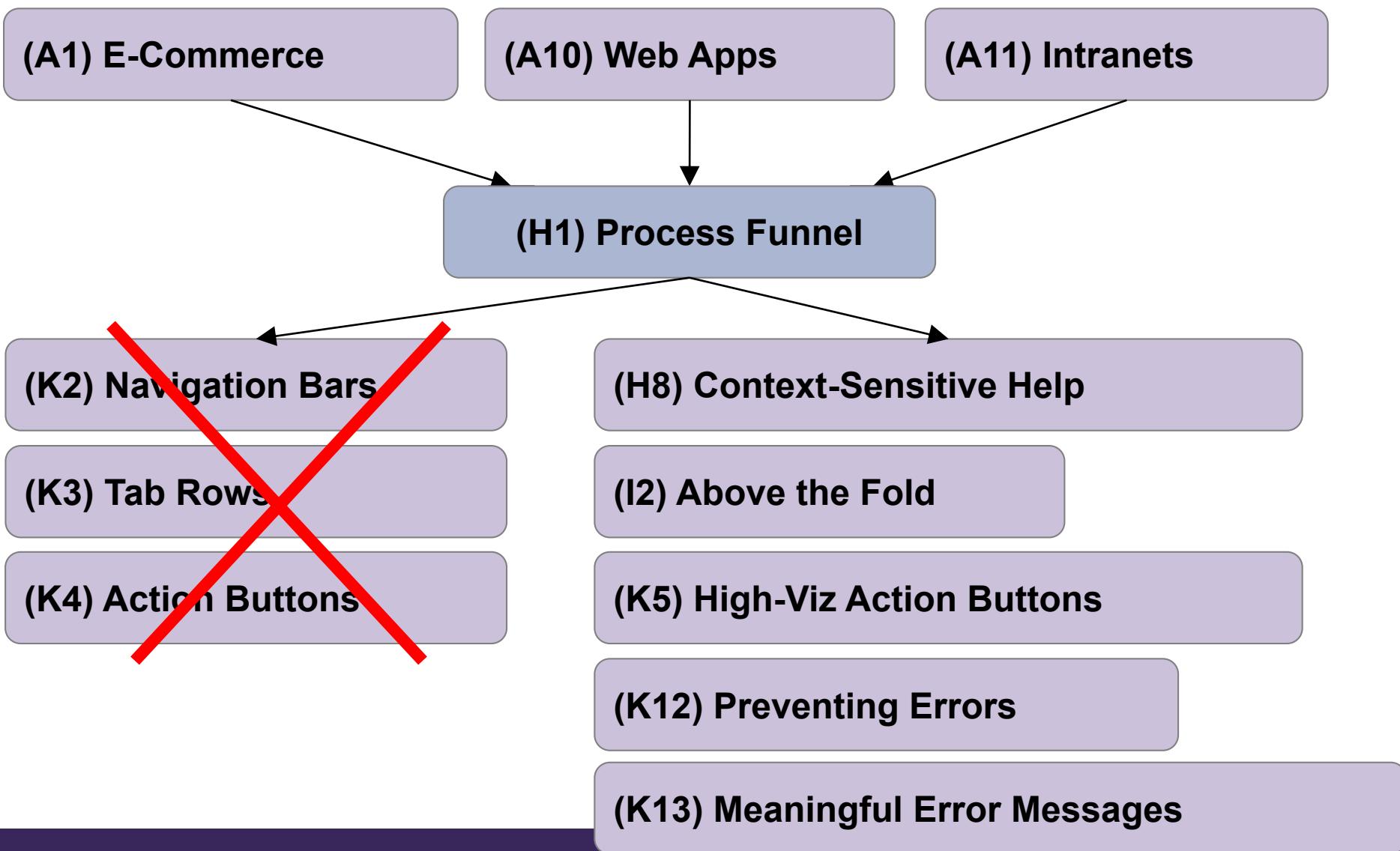


PROCESS FUNNEL (H1)

Solution Diagram



Related Patterns



Patterns Support Creativity

Patterns come from successful examples

sites that are so successful that lots of people
are familiar with their paradigms

interaction techniques/metaphors that work well
across many sites (e.g., shopping carts)

Not too general and not too specific

you need to specialize to your needs

Patterns let you focus on the hard,
unique problems of your design situation

Principles, Guidelines, Templates

Patterns help design without over-constraining
unlike principles, patterns are not too general

unlike guidelines, patterns discuss tradeoffs,
show good examples, and tie to other patterns

unlike style guides, patterns not too specific, can
be specialized to a design

unlike templates, patterns illustrate flows and
relationships among different pages

Web Design Patterns

H1 PROCESS FUNNEL



Pattern Name and Number

H1 PROCESS FUNNEL

Exemplar

Forces & Solution

Background

Problem Statement

*** BACKGROUND**
All Web applications that lead visitors through stepped tasks—PERSONAL E-COMMERCE (A1), SELF-SERVICE GOVERNMENT (A4), WEB APPS THAT WORK (A10), and ENABLING INTRANETS (A11)—need ways to help people succeed at completing the tasks.

*** PROBLEM**
Customers often need to complete highly specific tasks on Web sites, but pages with tangential links and many questions can prevent them from carrying out these tasks successfully.

People enjoy completing the tasks they start. Yet all kinds of distractions—including links that lead off the critical path, extra steps, and extra

PROCESS FUNNEL **H1**

Dell uses a process funnel consisting of several logical steps that guide customers to quickly configure and purchase a personal computer. Information in a pop-up window shows additional details but keeps customers in the funnel so that they can continue to completion.

Required to Complete a Task • Customers need to go through many steps. A process funnel should have two or three steps. Anything less than two steps is not a process, and a process of more than eight steps is unmanageable. If there are more than eight steps, try to split the process into two or more separate process funnels, or try combining multiple steps into one page. However, this is not always a viable solution because one choice may precede another, and not every page can hold all the information that customers might need at certain points.

Provide a Progress Bar to Let Customers Know How Far They've Come • Showing a progress bar at each step in a process funnel helps customers know how much farther they have to go to complete the task. It is often not worth your time to make a progress bar clickable because doing so is not a benefit for customers.

Remove Unnecessary Links and Content While Reinforcing the Brand • Removing links and content unrelated to the task at hand will reduce the number of choices available to customers, making it more likely that your customers will choose the right links to complete their tasks. Remove all NAVIGATION BARS (K2), TAB AD CRUMBS (K6), and EMBEDDED LINKS (K7), leaving only ACTION BUTTONS (K4) that help visitors reach their goal. Take out any content that is superfluous to the task.

Reinforce the Web site brand to minimize any disorientation customers might feel from sudden changes in navigation options. Use the same logo, font, and color scheme throughout the Web site so that no customer knows they're still on the same site.

where they are in the process funnel and how much farther they have to go.

(www.dell.com, May 18, 2002)

(www.half.com, October 24, 2001)

462 Patterns: Helping Customers Complete Tasks

463 Patterns: Helping Customers Complete Tasks

Web Design Patterns

H1 PROCESS FUNNEL

Use Pop-Up Windows to Provide Extra Information, without Leading Visitors Out of the Process Funnel • Sometimes customers need additional information that you have not provided on a page, such as extra help or product details. Provide a link to a pop-up window (H6) containing CLEAN PRODUCT DETAILS (F2) (see Figure H1.1), CONTEXT-SENSITIVE HELP (H8), or information from the FREQUENTLY ASKED QUESTIONS (H7) page, to make the extra information less intrusive. Your challenge is to implement this extra content without detracting from the main purpose.

Make Sure the Back Button Always Works • Customers often use the **Back** button on browsers to modify answers they have typed in on previous pages. However, if the Web site is not implemented correctly, the information they have already entered may be lost when they hit the **Back** button, forcing them to type everything again. In the worst case, people get a cryptic error message saying that the posted information was lost. You can address this annoying problem by temporarily storing the information they type in on each page, redisplaying this information if customers hit the **Back** button, and then overriding the temporarily stored information on the page if it is changed.

Always Make It Clear How to Proceed to the Next Step • Some Web pages are longer than can be displayed on a customer's Web browser. The problem is that people sometimes get lost if the critical ACTION BUTTON (K4), the one that takes them to the next step, is hidden below the fold. Place HIGH-VISIBILITY ACTION BUTTONS (K5) both high *and* low on the page, ensuring that at least one of the critical action buttons is visible without scrolling.

Prevent Errors Where Possible, and Provide Meaningful Error Messages If They Do Occur • People will always make mistakes. You can provide good customer support by providing clear error messages and sample input to help prevent errors. You can also provide MEANINGFUL ERROR MESSAGES (K13) to help customers correct their mistakes.

SOLUTION

Minimize the number of steps required to complete a task, keeping them between two and eight. Remove unnecessary and potentially confusing links and content from each page, while reinforcing the brand to maintain a sense of place. Use pop-up windows to provide extra information, without leading people out of the process funnel. Make sure the Back button always works so that customers can correct errors. Make it clear how to proceed to the next step.

H1 PROCESS FUNNEL

Bus Stops

Figure H1.3
A process funnel lets people complete their goals by breaking down complicated tasks into a small number of steps, using pop-up windows for detailed information, and reducing the number of links to only the critical ones, so that people are never distracted.

CONSIDER THESE OTHER PATTERNS

Many kinds of Web sites use process funnels, including sites for PERSONAL E-COMMERCE (A1), SELF-SERVICE GOVERNMENT (A4), WEB APPS THAT WORK (A10), and ENABLING INTRANETS (A11). Customers use process funnels when they finalize purchases through QUICK-FLOW CHECKOUT (F1), when they create new accounts through SIGN-IN/NEW ACCOUNT (H2), and when they post new messages to a RECOMMENDATION COMMUNITY (G4), to name some examples.

- REMOVE NAVIGATION BARS (K2), TAB ROWS (K3), IRRELEVANT ACTION BUTTONS (K4), LOCATION BREAD CRUMBS (K6), and EMBEDDED LINKS (K7) to ensure that customers stay on their paths. However, keep strong SITE BRANDING (E1) so that customers still know where they are.
- Design process funnels to PREVENT ERRORS (K12), and provide MEANINGFUL ERROR MESSAGES (K13) when errors do occur.
- Track your customers through PERSISTENT CUSTOMER SESSIONS (H5) to avoid problems with the **Back** button, and to save customer-entered information.
- MOVE EXTRA CONTENT, such as CONTEXT-SENSITIVE HELP (H8) and FREQUENTLY ASKED QUESTIONS (H7), to POP-UP WINDOWS (H6) to keep the main task page on the screen. Make the next action visible by keeping it ABOVE THE FOLD (I2) and by using HIGH-VISIBILITY ACTION BUTTONS (K5).

Pre-Patterns

Patterns require broad adoption and examples

Many versions of the same basic idea

Shown successful in many contexts

That is what makes them patterns

This is challenging in novel domains

Pre-patterns are based in weaker evidence

Can help speed diffusion of techniques and results

Can help see relationships among ideas

UbiComp Pre-Patterns

Literature review

Button-up card sorting of lessons from literature
Cut down based on critique by other researchers

E13 - Notification on Access of Personal Data



Forces

A key design decision here is whether the person is simply notified or has choice over whether information is disclosed. There are plausible cases for each. For example, "always let my family know where I am", but "let me choose whether to reveal my current location if a co-worker asks". This is primarily an issue of trust and boundaries with other individuals.

[Privacy Mirrors](#) also act as a form of notification. Notification can also be combined with unobtrusive displays to provide constant feedback.

Figure 1. AT&T Wireless Find Friends service notifies your friend if you ask for his or her location.

Synopsis

Systems can provide feedback about what is being monitored and recorded.

Background

This pattern is one part of providing [Appropriate Privacy Feedback](#) to individuals.

Problem

How can systems provide feedback about what is being monitored, as well as the current state of the system?

Solution

There at least two different times that notification can be used, during an access and afterwards.

UbiComp Pre-Patterns

B6 • FIND A FRIEND

NOKIA

Find Friends

- 1 Find Friends**
- 2 Be visible / Invisible**
- 3 Meet friend**
- 4 Find nearest**
- 5 Add/edit friends**
- 6 Tell a friend**
- 7 Help**

Figure 1. AT&T Wireless' mMode service allows customers to add friends to a friend list, find out who is nearby, and call or send messages to them. Users can make themselves invisible whenever they want.

• **BACKGROUND**

This pattern discusses services that allow people to find where their friends are while allowing those friends some level of privacy. This pattern is useful for GUIDES FOR EXPLORATION AND NAVIGATION (A5).

• **PROBLEM**

People would like to know where their friends are, for impromptu communication and gatherings. At the same time, those people may not always want to be tracked.

Displaying people's location • There are several different ways of displaying a person's location. A straightforward approach is to simply show the location in text, for example "near corner of Euclid Ave and Hearst Ave" or "in Soda Hall". Another approach is to show the data on a map, or possibly even an ACTIVE MAP (B1) that is constantly updated.



Figure 2. UC San Diego's ActiveCampus project shows your friends' location in real time. While useful, this visualization raises many privacy concerns.

Managing privacy concerns • There are many privacy concerns about find-a-friend applications due to the potential for abuse. This is not just the fear of "Big Brother," but also so-called "Little Brothers," including teachers,

UbiComp Pre-Patterns

A – Ubiquitous Computing Genres	B – Physical-Virtual Spaces	C – Developing Successful Privacy	D – Designing Fluid Interactions
Describes broad classes of emerging applications, providing many examples and ideas	Associating physical objects and spaces with information and meaning; location-based services; helping users navigate such spaces	Policy, systems, and interaction issues in designing privacy-sensitive systems	How to design for interactions involving dozens or even hundreds of sensors and devices while making users feel like they are in control
Upfront Value Proposition (A1) Personal Ubiquitous Computing (A2) Ubiquitous Computing for Groups (A3) Ubiquitous Computing for Places (A4) Guides for Exploration and Navigation (A5) Enhanced Emergency Response (A6) Personal Memory Aids (A7) Smart Homes (A8) Enhanced Educational Experiences (A9) Augmented Reality Games (A10) Streamlining Business Operations (A11) Enabling Mobile Commerce (A12)	Active Map (B1) Topical Information (B2) Successful Experience Capture (B3) User-Created Content (B4) Find a Place (B5) Find a Friend (B6) Notifier (B7)	Fair Information Practices (C1) Respecting Social Organizations (C2) Building Trust and Credibility (C3) Reasonable Level of Control (C4) Appropriate Privacy Feedback (C5) Privacy-Sensitive Architectures (C6) Partial Identification (C7) Physical Privacy Zones (C8) Blurred Personal Data (C9) Limited Access to Personal Data (C10) Invisible Mode (C11) Limited Data Retention (C12) Notification on Access of Personal Data (C13) Privacy Mirrors (C14) Keeping Personal Data on Personal Devices (C15)	Scale of Interaction (D1) Sensemaking of Services and Devices (D2) Streamlining Repetitive Tasks (D3) Keeping Users in Control (D4) Serendipity in Exploration (D5) Context-Sensitive I/O (D6) Active Teaching (D7) Resolving Ambiguity (D8) Ambient Displays (D9) Follow-me Displays (D10) Pick and Drop (D11)

Patterns

When you see advice, consider its depth

Result of an individual study / rant

Pre-pattern based on some meta-analysis

Established pattern

Be aware of misapplying patterns

And be aware of anti-patterns

Touch and Microsoft Windows



2004



2012

Consistency vs. Specialization

Beware of simply copying a design language

Consistency is your friend
until is it not your friend

Not limited to platform-level decisions

One “look” for your app
Or targeted at each device

Dark Patterns

A Dark Pattern is an interface that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

Disguised Ads

Ads that are disguised as other kinds of content or navigation, in order to get users to click on them

Dark Patterns

A Dark Pattern is an interface that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

Friend Spam

A site or game asks for your credentials, then goes on to publish content or send out bulk messages

Dark Patterns

The screenshot shows a web browser window with the URL https://www.fastcodesign.com/3051906/fast-feed/after-lawsuit-settlement-linkedin-s-dishonest-design-is-now-a-13-million-problem?utm_source=facebook. The page is titled "After Lawsuit Settlement, LinkedIn's Dishonest Design Is Now A \$13 Million Problem". It features a sidebar with the word "EVIDENCE" and a list of five trending articles. Below the main title, there is a section with social sharing icons and a photograph of a smartphone displaying the LinkedIn login screen.

EVIDENCE

After Lawsuit Settlement, LinkedIn's Dishonest Design Is Now A \$13 Million Problem

HOPEFULLY, THIS WILL BE A LESSON TO OTHER COMPANIES WHO USE DARK UX PATTERNS TO TRICK THEIR USERS.

10 NOTES | 5 PIN | 108 PLUS | 853 SHARE | 1.2K TWEET | 1.5K LIKE

Anyone who has ever signed up, or even known anyone who has signed up, for LinkedIn has probably found themselves on the receiving end of dozens of follow-up emails, inviting you to "expand your professional network." Even worse, they're virtually impossible to opt-out of. It's a scummy use of **dark UX patterns** by a company that should know better. Now, LinkedIn is going to be paying for it as part of a class-action lawsuit, to the tune of \$13 million.

Photo: Bloomua via Shutterstock

Presented in San Jose's U.S. District Court, the key issue in *Perkins v. LinkedIn* is spam. Namely, during the user sign-up process, LinkedIn claims that it "will not store your password or email anyone without your permission." Despite this, LinkedIn sends automated follow-up email reminders on a new user's behalf to any contacts harvested from their webmail accounts, which are presented in such a way as to appear as if they came directly from the user.

Under California law, the sitting judge says has deemed this illegal. Consequently, if you were a member of LinkedIn's "add connection" program between September 2011 and October 2014, you can submit a claim to get a payout.

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Lecture 14:
Testing and Patterns

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Tuesday / Thursday
10:30 to 11:50