

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 10:
Testing

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Alex Fiannaca
Lauren Milne
Saba Kawas
Kelsey Munsell

Tuesday/Thursday
12:00 to 1:20



Today

Presentations on Thursday

Balance

Ecotopia

FoodPic

MiPhone

Social Reconnection

TagLine

Presentations on Friday Afternoon

Neat

Poliscope

SchoolView

Sitless

SmartClothing

Timeout

No Section Friday Morning



Today

For Presentations

PowerPoint or PDF

Mind Your Time Limits

Peer Feedback Forms

Project 3a Due for Tuesday

In-Class Design, Prototype, Test

Testing and Patterns



In-Class Design, Prototype, Test

Design and prototype a new touchscreen alarm clock to be deployed in a very high end hotel brand. Your alarm clock should be immediately usable for tired, busy, or just-don't-want-to-be-bothered travelers who will spend zero time learning your interface.

In addition to displaying the current time, your alarm clock should include basic functionality for:

- turning the alarm on/off

- setting the wake-up time

- anything else you think is appropriate

Guests will interact with your alarm using a touch panel.



Task Design is Important

The goal of a test is to figure out how a person interacts with an interface in the wild...

There are two possible explanations for why a test does not find significant problems:

- The interface does not have significant problems

- The test itself has significant problems



Task Design is Important

Testing is not entirely in the wild

As a part of focusing the test, you often need to give a person a somewhat artificial task

The artificiality of the task may influence how people interact with an interface...

...and thus may influence the outcomes and insights gained through user testing



Bad: Artificial Subgoals

People using the design “in the wild” may not necessarily form these same subgoals

The task should give one top-level goal, a people should form their subgoals while pursuing this

Now you want to choose the type of paper you want to print your document on. Lets imagine that Bin “B” has the paper you want to print your paper on, please complete this task.

Now set the darkness of your copies to about 50% dark. After setting the darkness, you decide you want to print 2 sides of copies on two sides of paper. Please complete this task.



Bad: Artificial Ordering

With an artificial ordering of information or subgoals, people might not proceed in this order

The ordering might also be biased towards the layout of the interface, which would conceal any problems with finding the appropriate control

- Enter in 10 copies, with lightness set to 10%.
- Choose 1 sided to 2 sided, use paper source bin A.
- Cover sheet needed, using paper bin B for cover sheet.
- Set stapling feature on and collating on.
- Start printing.



Bad: Changing the Task

The task is to make copies, and this happens to involve entering information in the copier interface

But this task description is an data entry task,
“Here is some information. Put it in the interface.”

- Make 23 copies
- With collate
- Cover sheets
- Default darkness
- 1 Sided-> 1 Sided



Bad: Giving the Answers

Tells the person what terminology the interface uses, which they might not otherwise know

lighten = contrast, sorted = collated?

You are a teacher and are trying to make 40 copies of a one-sided magazine article that is 10 pages long for your class tomorrow. Due to the large number of copies, you print the article double-sided, in other words 10 page article would be printed on 5 sheets of paper. Due to the high contrast of the article, you must lighten the copy, in other words change the contrast. You then want the copies to be collated and stapled.



Good: Giving Context

Giving realistic context through scenarios can reduce the artificiality of the task

It's your first day in the office, starting a new job. You would like to make some copies of several documents that your boss gave you to browse through. Your colleague in the next cubicle tells you that you need an access code to make copies. The code is 5150. You walk over to the copy machine at the end of the hall and realize that it is not the Xerox copier that you are accustomed to... Make 2 copies of the "Company Annual Report".



Consider: Under-Specified Tasks

Many realistic goals are under-specified, as people have only a general idea what they want

By under-specifying the task, you can elicit realistic confusion and decision-making

You just finished fixing up the old hot rod in the garage and now its time to sell her. Make a couple copies of the pictures you took to **send into the used car sales magazines. It's ok that they're in black and white** but maybe you should lighten them up a bit. Your account billing code is 5150.



Task Design Summary

Task design is difficult and important

Poorly designed tasks mask interface failures

If you are not confident in your task descriptions,
have others help you “debug” them before testing



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

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 more closely with traditional methods



Semi-Automated Remote Usability

The screenshot shows a Netscape browser window titled "NetRaker Intelligence Center Tour - Netscape". The address bar contains "http://www.netraker.com". The browser's menu bar includes "File", "Edit", "View", "Go", "Communicator", "Help", and "Send". The toolbar contains icons for Back, Forward, Reload, Home, Search, Netscape, Print, Security, Shop, and Stop.

The main content area displays a task instruction: "Please refer to the web site below for the following...". Below this, a task is listed: "(1) Find a flat panel monitor that costs less than \$1200. Please try to accomplish this task without using the search function." Three radio buttons are provided for feedback: "I was able to complete the task", "I was not able to complete the task", and "I think that I was able to complete the task, but I'm not sure". A "Next" button is visible to the right of the task.

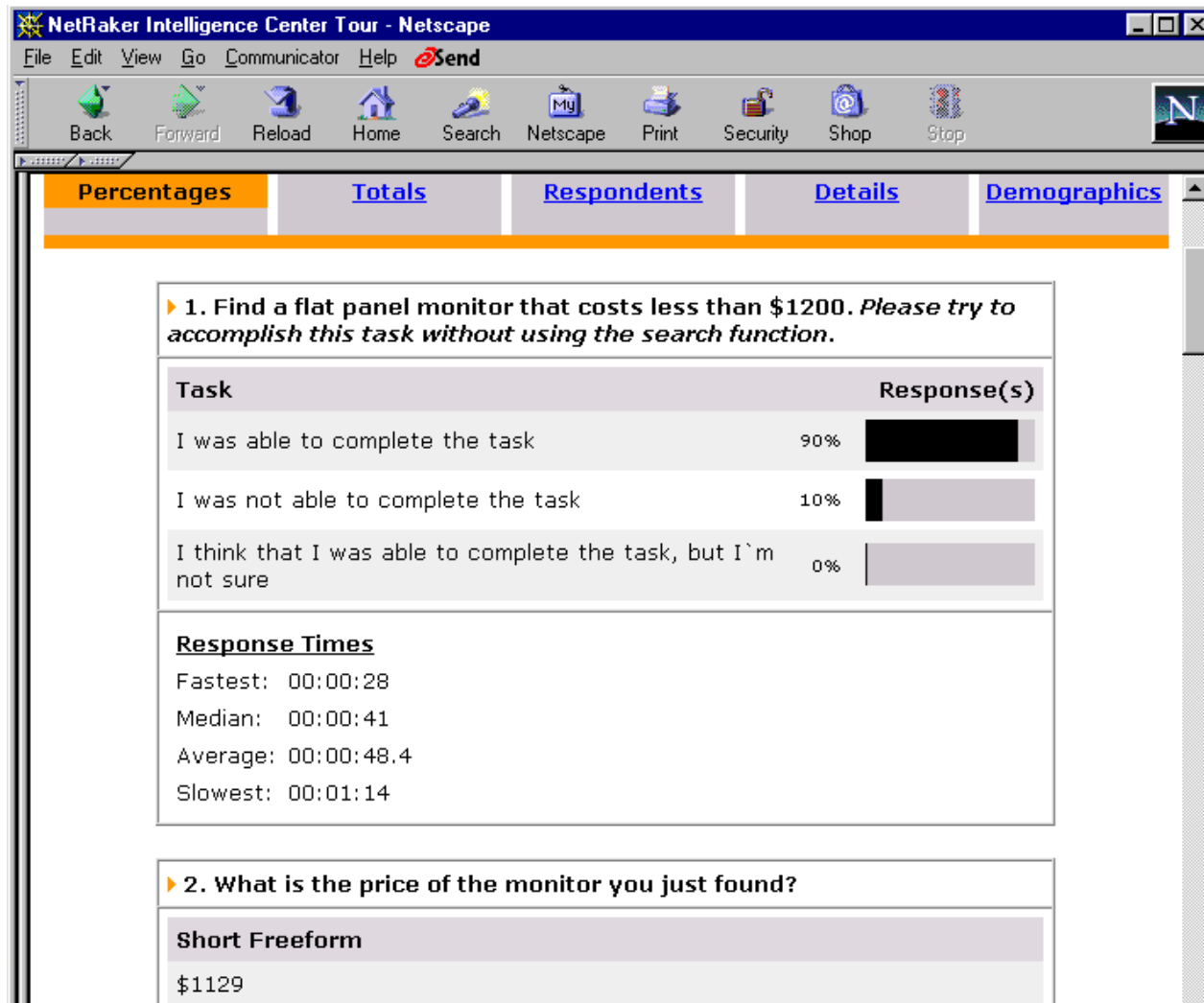
The website being visited is "ACME Computers". The page features a navigation menu on the left with items: Home, Laptops & Notebooks, Desktop Computers, Printers, Monitors, LCD Flat Panel Displays, Video Cards, Scanners, Digital Cameras, Palmtops, Show Order, and Info. The main content area is titled "ACME Computers" and "LCD Flat Panel Displays". It lists three products:

Product	Price
Mitsubishi 18IN LCD PANEL	\$3,460.00
Compaq 18IN TFT 28MM 1280X1024	\$3,839.00
IBM 18IN/18.0V ANALOG TFT	\$4,099.00

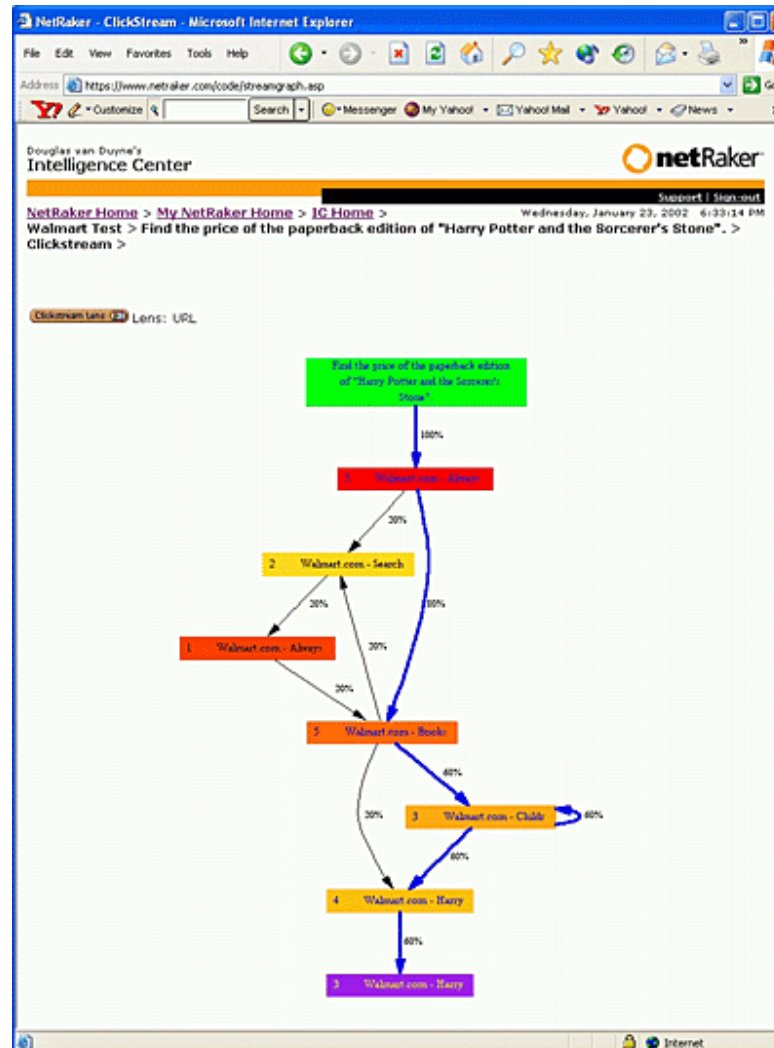
The browser's status bar at the bottom shows "Document: Done" and various system icons.



Semi-Automated Remote Usability



Semi-Automated Remote Usability



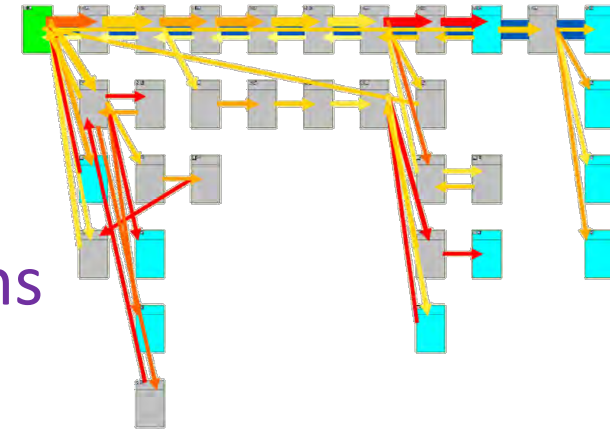
WebQuilt: Visual Analysis

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

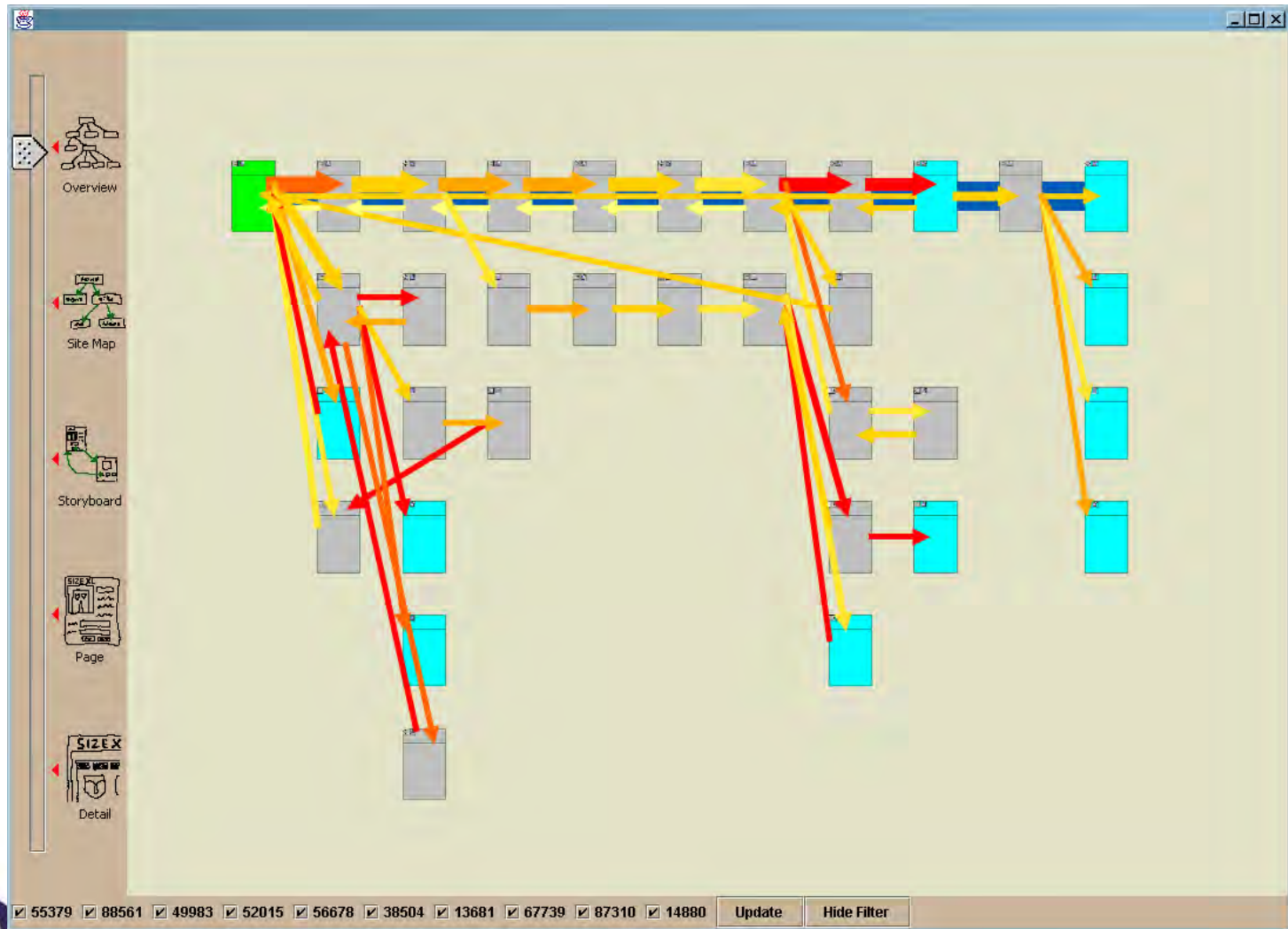
color code common usability interests

filtering to show only target participants

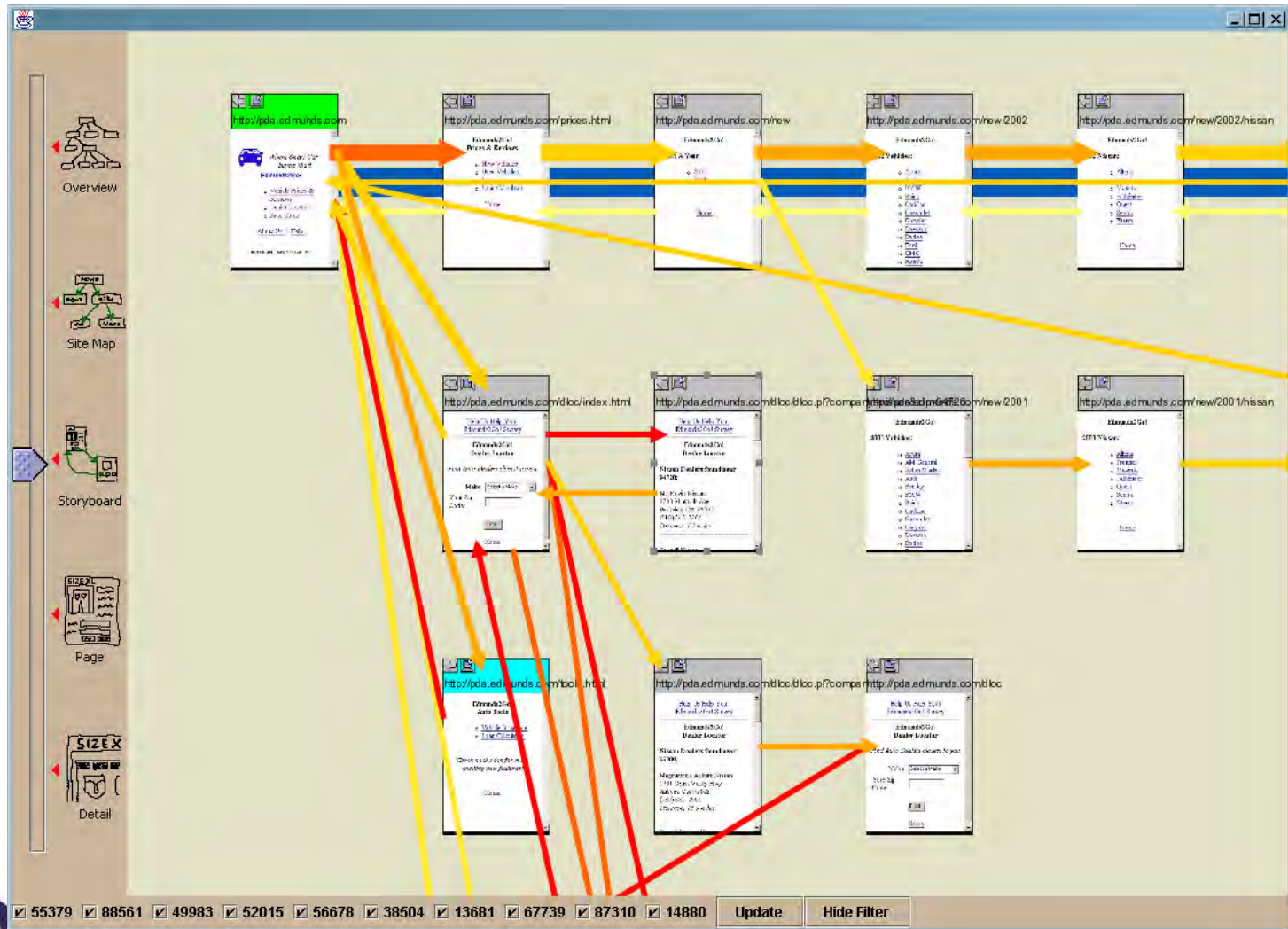
use zooming for analyzing data at varying granularity



WebQuilt: Visual Analysis



WebQuilt: Visual Analysis



WebQuilt: Visual Analysis

The screenshot displays the WebQuilt interface, which is used for visual analysis of web content. On the left side, there is a vertical navigation pane with several icons and labels: "Overview", "Site Map", "Storyboard", "Page", and "Detail". The main area shows a preview of a mobile website for "Edmunds2Go". The URL "http://pda.edmunds.com" is displayed at the top of the preview. The website content includes a blue car icon, the text "Where Smart Car Buyers Start", the "Edmunds2Go!" logo, and a list of links: "Vehicle Prices & Reviews", "Dealer Locator", and "Auto Tools". Below these links are "About Us" and "Help" links, and a copyright notice "© 2000-2001 Edmunds.Com Inc.". The interface also features a bottom status bar with a list of numbers (55379, 88561, 49983, 52015, 56678, 38504, 13681, 67739, 87310, 14880) and buttons for "Update" and "Hide Filter". Overlaid on the right side of the preview are several colored lines (orange, blue, yellow, red) that represent navigation paths or user interactions.



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



Controlled A/B Experiments

Many names for concept

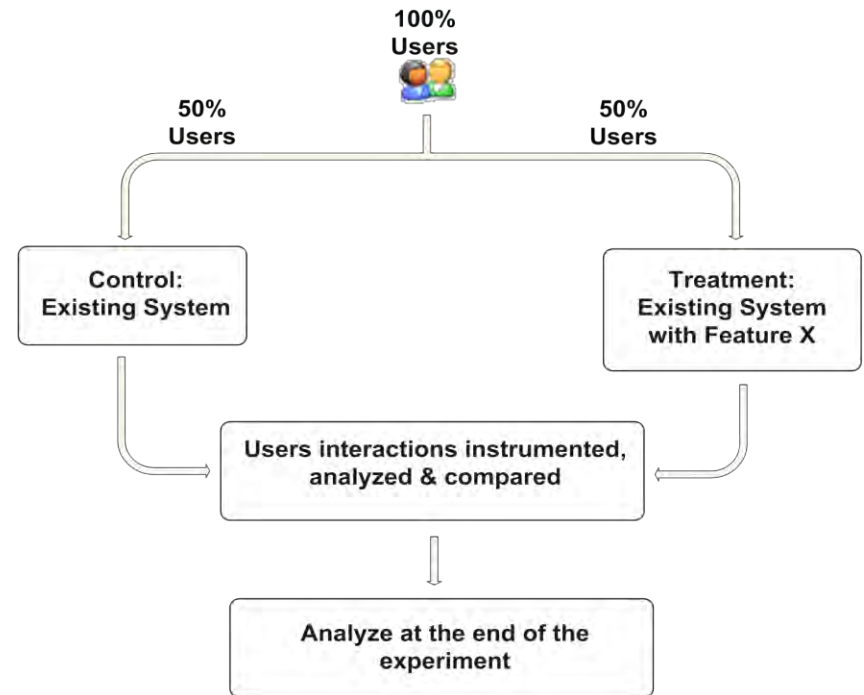
A/B tests or
Control/Treatment

Randomized
Experimental Design

Controlled experiments

Split testing

Parallel flights



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:

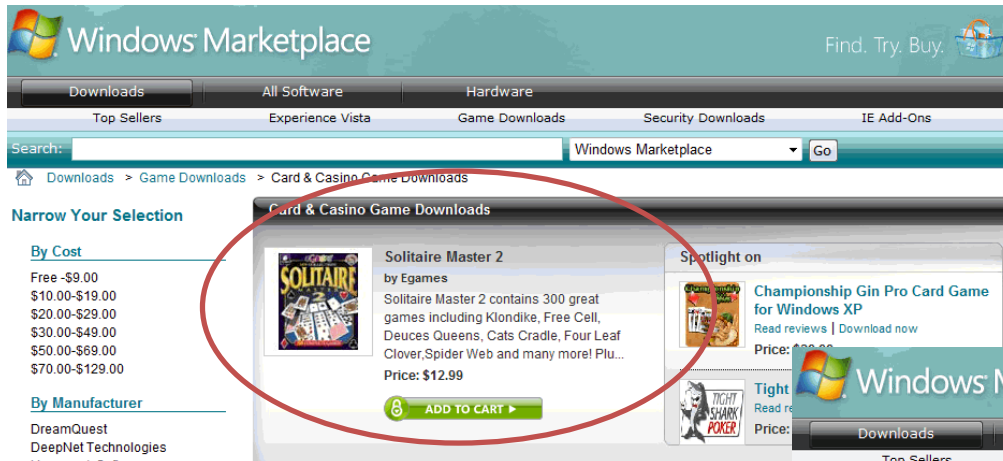
Wildly successful



Marketplace: Solitaire vs Poker

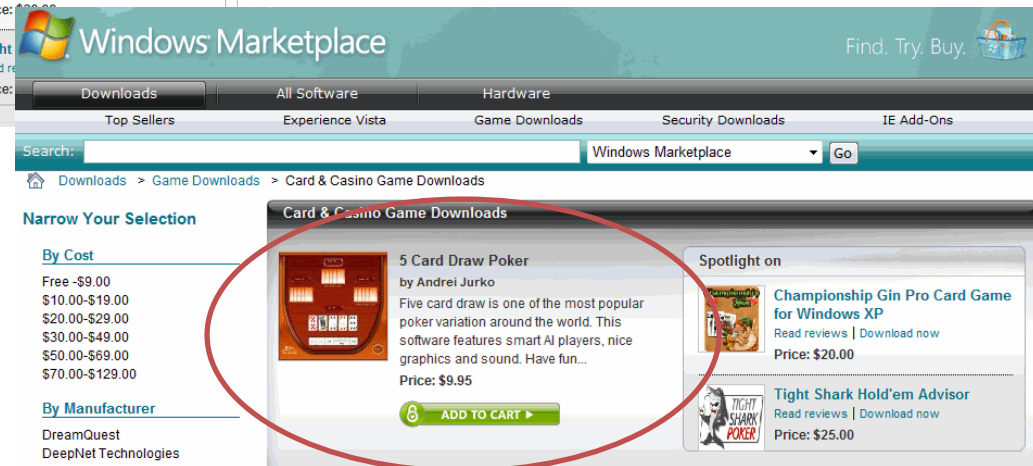
Experiment run in Windows Marketplace / Game Downloads

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?

Windows Marketplace Find. Try. Buy.

Downloads All Software Hardware

Top Sellers Experience Vista Game Downloads Security Downloads IE Add-Ons

Search: Windows Marketplace Go

Downloads > Game Downloads > Card & Casino Game Downloads

Narrow Your Selection

By Cost

- Free -\$9.00
- \$10.00-\$19.00
- \$20.00-\$29.00
- \$30.00-\$49.00
- \$50.00-\$69.00
- \$70.00-\$129.00

By Manufacturer

- DreamQuest
- DeepNet Technologies
- Haveaack Software

Card & Casino Game Downloads

Solitaire Master 2
by Egames
Solitaire Master 2 contains 300 great games including Klondike, Free Cell, Deuces Queens, Cats Cradle, Four Leaf Clover, Spider Web and many more! Plus...
Price: \$12.99

Spotlight on

Championship Gin Pro Card Game for Windows XP
Read reviews | Download now
Price: \$20.00

Tight Shark Hold'em Advisor
Read reviews | Download now
Price: \$25.00

ADD TO CART

A: Solitaire game

A is 61% better

B: Poker game

Windows Marketplace Find. Try. Buy.

Downloads All Software Hardware

Top Sellers Experience Vista Game Downloads Security Downloads IE Add-Ons

Search: Windows Marketplace Go

Downloads > Game Downloads > Card & Casino Game Downloads

Narrow Your Selection

By Cost

- Free -\$9.00
- \$10.00-\$19.00
- \$20.00-\$29.00
- \$30.00-\$49.00
- \$50.00-\$69.00
- \$70.00-\$129.00

By Manufacturer

- DreamQuest
- DeepNet Technologies
- Haveaack Software

Card & Casino Game Downloads

5 Card Draw Poker
by Andrei Jurko
Five card draw is one of the most popular poker variation around the world. This software features smart AI players, nice graphics and sound. Have fun...
Price: \$9.95

Spotlight on

Championship Gin Pro Card Game for Windows XP
Read reviews | Download now
Price: \$20.00

Tight Shark Hold'em Advisor
Read reviews | Download now
Price: \$25.00

ADD TO CART



Never Underestimate Solitaire

SIX CHIX

BY RINA PICCOLO



Never Underestimate Solitaire

The screenshot shows a web browser displaying a Fortune magazine article. The article title is "Activision Acquires Candy Crush Maker King Digital For \$5.9 Billion". The author is Mathew Ingram, and the date is November 3, 2015. The article features a large image of a tablet displaying the Candy Crush game interface. The text discusses the acquisition price, the company's current price, and a discount to its recent IPO price. It also mentions that 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 is about 20% lower than the price at which the company went public 18 months ago. A sidebar on the left lists various news items, and a "MORE" section on the right provides additional context.

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

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

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?
Photograph by Andrew Hurrell — 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

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- ✓ 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

Update Total: \$0.00

Select Shipping Method Standard (\$5.95)

100% Secured Checkout

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- ✓ 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

Discount \$0.00
Total \$0.00

Enter Coupon Code

Select Shipping Method Standard (\$5.95)

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Recalculate Continue Shopping > Proceed To Checkout

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Which version has a higher conversion rate?

Checkout Page

Conversion rate is percentage of visits that include purchase

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

Update Total: \$0.00

Select Shipping Method Standard (\$5.95)

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- ✓ 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)

Recalculate Continue Shopping > Proceed To Checkout

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Which version has a higher conversion rate?

Checkout Page

Conversion rate is percentage of visits that include purchase

A

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Continue Shopping > Proceed To Checkout

Item Name	Item Number	Quantity	Remove	Unit Price	Subtotal
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Update Total: \$0.00

Select Shipping Method Standard (\$5.95)

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B

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- ✓ 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	\$0.00

Enter Coupon Code

Select Shipping Method Standard (\$5.95)

Recalculate Continue Shopping > Proceed To Checkout

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

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Which version has a higher conversion rate?

Coupon Code decreases by factor of 10

Example from Bryan Eisenberg's article on clickz.com

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

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

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

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?

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?

How was this information helpful?

What are you trying to do?

How can we make this information more helpful?



Another Feedback Variant

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

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

C

The flowchart for variant C starts with the question "Was this information helpful?". It has three response options: "Yes", "No", and "I don't know".

- If the user selects "Yes", the flow goes to a form titled "How was this information helpful?". This form has a text input field and "Back" and "Submit" buttons.
- If the user selects "No", the flow goes to a form titled "How can we make this information more helpful?". This form has a text input field and "Back" and "Submit" buttons.
- If the user selects "I don't know", the flow goes to a form titled "What are you trying to do?". This form has a text input field and "Back" and "Submit" buttons.

C outperforms B by a factor of 3.5



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
- 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

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



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.



NUCCI STUDIO

[◀ PREVIOUS](#)
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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

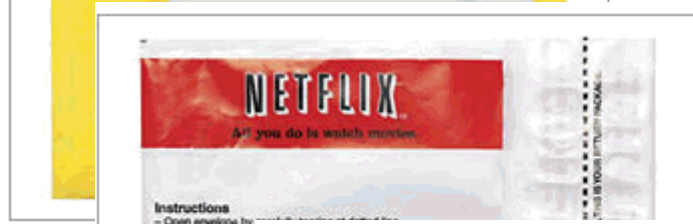


[PREVIOUS](#) [NEXT](#)

[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](#)

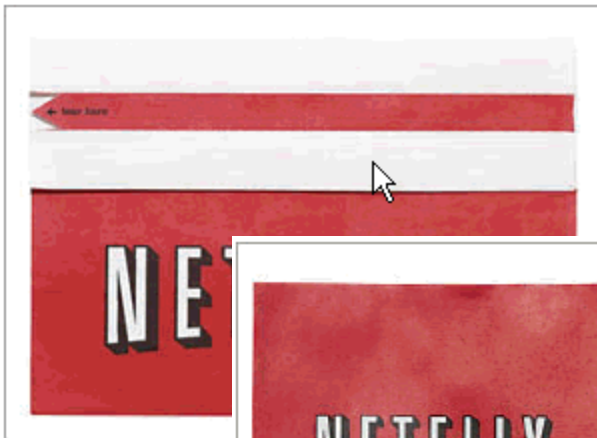
[Back to story](#)

2001

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

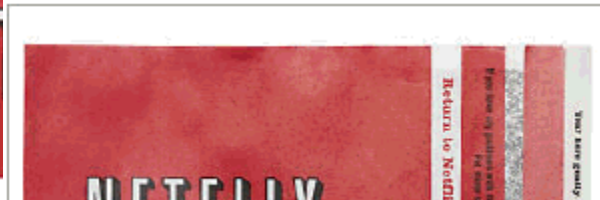


Data Driven Methods Not Just Online


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[NEXT >](#)
[Back to story](#)

2001

Foam padding is dropped because the benefits don't justify the cost. The company gives top-loading another try.


[< PREVIOUS](#)
[NEXT >](#)
[Back to story](#)

2001

Marking a return to side-loading, this mailer is a direct ancestor of the one the company uses today.


[< PREVIOUS](#)
[NEXT >](#)
[Back to story](#)

2003

Instead of sealing the entire top and bottom, Netflix introduces a circular sticker, affixed only on the top.


[< PREVIOUS](#)
[NEXT >](#)
[Back to story](#)

2004

A window shows the disc bar code. Speculation is that this enables storing discs in mailers prior to shipping.

[NEXT >>](#)


Limitations

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

How about we step through a larger example



CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 10:
Testing

James Fogarty
Alex Fiannaca
Lauren Milne
Saba Kawas
Kelsey Munsell

Tuesday/Thursday
12:00 to 1:20

