### **CSE440: Introduction to HCI**

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 14: Patterns

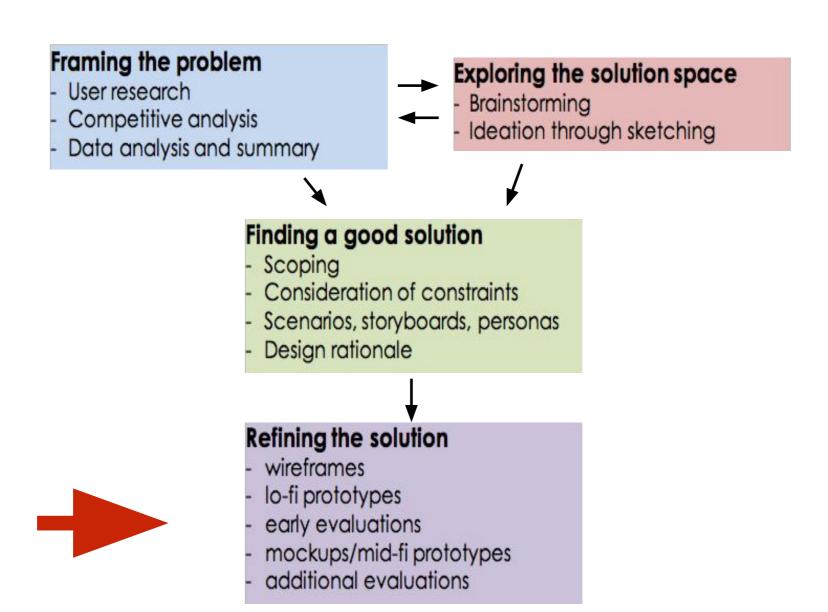
Nigini Oliveira Manaswi Saha Liang He Jian Li Zheng Jeremy Viny





Nov 12	Nov 13	Nov 14	Nov 15	Nov 16
Veterans Day	Patterns	Nigini's office hours	Interface Implementation	Section
3d - Usability Testing Review	11:30 - 12:50   OUG 141	10:00 - 12:00	11:30 - 12:50   OUG 141	10:30 - 11:20   PAR 112
		CSE 218		11:30 - 12:20   OUG 136
				1:30 - 2:20   MGH 295
				2:30 - 3:20   MGH 295
				3e - Digital Mockup
Nov 19	Nov 20	Nov 21	Nov 22	Nov 23
	Recap and Exam Q&A Session	Nigini's office hours	Thanksgiving	Thanksgiving
	11:30 - 12:50   OUG 141	10:00 - 12:00		-
		CSE 218		
Nov 26	Nov 27	Nov 28	Nov 29	Nov 30
Nov 26	Nov 27 NO CLASS	Nov 28  Nigini's office hours	Nov 29 Exam	Nov 30 Section
Nov 26		-		2010 D. C.
Nov 26		Nigini's office hours	Exam	Section
Nov 26		Nigini's office hours 10:00 - 12:00	Exam	Section 10:30 - 11:20   PAR 112
Nov 26		Nigini's office hours 10:00 - 12:00	Exam	Section 10:30 - 11:20   PAR 112 11:30 - 12:20   OUG 136
Nov 26		Nigini's office hours 10:00 - 12:00	Exam	Section 10:30 - 11:20   PAR 112 11:30 - 12:20   OUG 136 1:30 - 2:20   MGH 295
Nov 26		Nigini's office hours 10:00 - 12:00	Exam	Section 10:30 - 11:20   PAR 112 11:30 - 12:20   OUG 136 1:30 - 2:20   MGH 295 2:30 - 3:20   MGH 295

# Course Progress



"... a general repeatable solution to a commonly-occurring usability problem in interface design..."



The Smartest Place to Buy and Sell Books, Music, Computers, Electronics, DVDs & more...

#### Welcome

Learn about Buying Learn about Selling Register Now!

Announcement Board Updated Jun 13, 2002

DESKTOP as low as S249! CENTER

#### Categories

#### Books

Textbooks, Fiction, Biography, Cooking, Business, & more...

#### Music

Rock, Hip Hop/Rap, Country, Pop, eBay items, & more...

#### Movies/DVDs

Action, Comedy, Children's, Romance, Animation, & more...

#### Games

PS2, Xbox, GameCube, Dreamcast, N64, & more...



More Hot New Releases!

#### Music



In-Stock Now!	Our Price	List Price
Weezer, Weezer	\$6.99	\$18.97
Gutterflower, Goo Goo Dolls	\$9.00	\$18.98
The Slim Shady LP, Eminem	\$2.98	\$18.97
Echoes, Pink Floyd	\$11.54	\$24.97
<u>18</u> , Moby	\$10.99	\$18.98





### Just Released: The Royal Tenenbaums for \$18.45 Wes Anderson (Rushmore) directs a motley crew of talented actors in this hysterical comedy about the rise and fall of an eccentric family.

In-Stock Now!	Our Price	List Price
Monster's Ball (DVD)	\$11.25	\$24.99

#### Advance Orders



The Simpsons: Complete 2nd Season (DVD) \$34.97 Save 30%!

The Sopranos: Complete 3rd Season (DVD) \$67.99 Save 32%!

Tom Clancy: Red Rabbit (Hardcover)

\$19.40 Save 33%!

#### In Computers

#### Gateway Desktop Under \$400!

Includes an 800MHz Intel Celeron processor, 256MB RAM, 20GB hard drive, DVD-ROM drive, and more!

Save Over \$100 on Dell Latitude
CPx!
\$639.00

Get the best quality at the best price with the Dell Latitude CPx featuring an Intel Pentium III® 500 MHz processor, 256 MB RAM and 12 GB hard

#### Gateway Desktop Under \$500 \$499.00

Includes a 1GHz Intel Pentium III processor, 256MB RAM, 20GB hard drive, CD-RW drive, 250MB ZIP Drive, and more!



More great deals...

# Site-branding



The Smartest Place to Buy and Sell Books, Music, Computers, Electronics, DVDs & more...

#### Welcome

Learn about Buying Learn about Selling Register Now!

Announcement Board Updated Jun 13, 2002



#### Categories

#### Books

Textbooks, Fiction, Biography, Cooking, Business, & more...

#### Music

Rock, Hip Hop/Rap, Country, Pop, eBay items, & more....

#### Movies/DVDs

Action, Comedy, Children's, Romance, Animation, & more...

#### Games

PS2, Xbox, GameCube, Dreamcast, N64, & more...



#### Red Hot Price for the Chili Peppers' New CD: \$11.88! Evolving after the popularity of Californication, the Chili Peppers release a new album featuring the hit song "By the Way".

In-Stock Now!	Our Price	List Price
Weezer, Weezer	\$6.99	\$18.97
Gutterflower, Goo Goo Dolls	\$9.00	\$18.98
The Slim Shady LP, Eminem	\$2.98	\$18.97
Echoes, Pink Floyd	\$11.54	\$24.97
<u>18</u> , Moby	\$10.99	\$18.98





#### Just Released: The Royal Tenenbaums for \$18.45 Wes Anderson (Rushmore) directs a motley crew of talented actors in

this hysterical comedy about the rise and fall of an eccentric family.

In-Stock Now!	Our Price	List Price
Monster's Ball (DVD)	\$11.25	\$24.99

#### Advance Orders



The Simpsons: Complete 2nd Season (DVD) \$34.97 Save 30%!

The Sopranos: Complete 3rd Season (DVD) \$67.99 Save 32%!

Tom Clancy: Red Rabbit (Hardcover)

\$19.40 Save 33%!

#### In Computers

#### Gateway Desktop Under \$400! \$399.00





Get the best quality at the best price with the Dell Latitude CPx featuring an Intel Pentium III® 500 MHz

processor, 256 MB RAM and 12 GB hard

#### Gateway Desktop Under \$500 \$499.00



Includes a 1GHz Intel Pentium III processor, 256MB RAM, 20GB hard drive, CD-RW drive, 250MB ZIP Drive, and more!

More great deals...

# Value Proposition



### What can I do here?



### Information above the fold







#### Categories

#### Books

Textbooks, Fiction, Biography, Cooking, Business, & more...

#### Music

Rock, Hip Hop/Rap, Country, Pop, eBay items, & more....

#### Movies/DVDs

Action, Comedy, Children's, Romance, Animation, & more...

#### Games

PS2, Xbox, GameCube, Dreamcast, N64, & more...



#### Red Hot Price for the Chili Peppers' New CD: \$11.88! Evolving after the popularity of Californication, the Chili Peppers release a new album featuring the hit song "By the Way".

In-Stock Now!	Our Price	List Price
Weezer, Weezer	\$6.99	\$18.97
Gutternower, Goo Goo Dolls	\$9.00	\$18.98
The Slim Shady LP, Eminem	\$2.98	\$18.97
Echoes, Pink Floyd	\$11.54	\$24.97
<u>18</u> , Moby	\$10.99	\$18.98

More Hot New Releases!





#### Just Released: The Royal Tenenbaums for \$18.45 Wes Anderson (Rushmore) directs a motley crew of talented actors in

this hysterical comedy about the rise and fall of an eccentric family.

In-Stock Now!	Our Price	List Price
Monster's Ball (DVD)	\$11.25	\$24.99

(DVD) \$67.99 Save 32%!

Tom Clancy: Red Rabbit (Hardcover) \$19.40 Save 33%!

#### In Computers

#### Gateway Desktop Under \$400! \$399.00

Includes an 800MHz Intel Celeron processor, 256MB RAM, 20GB hard drive, DVD-ROM drive, and more!



#### Save Over \$100 on Dell Latitude \$639.00

Get the best quality at the best price with the Dell Latitude CPx featuring an Intel Pentium III® 500 MHz

processor, 256 MB RAM and 12 GB hard

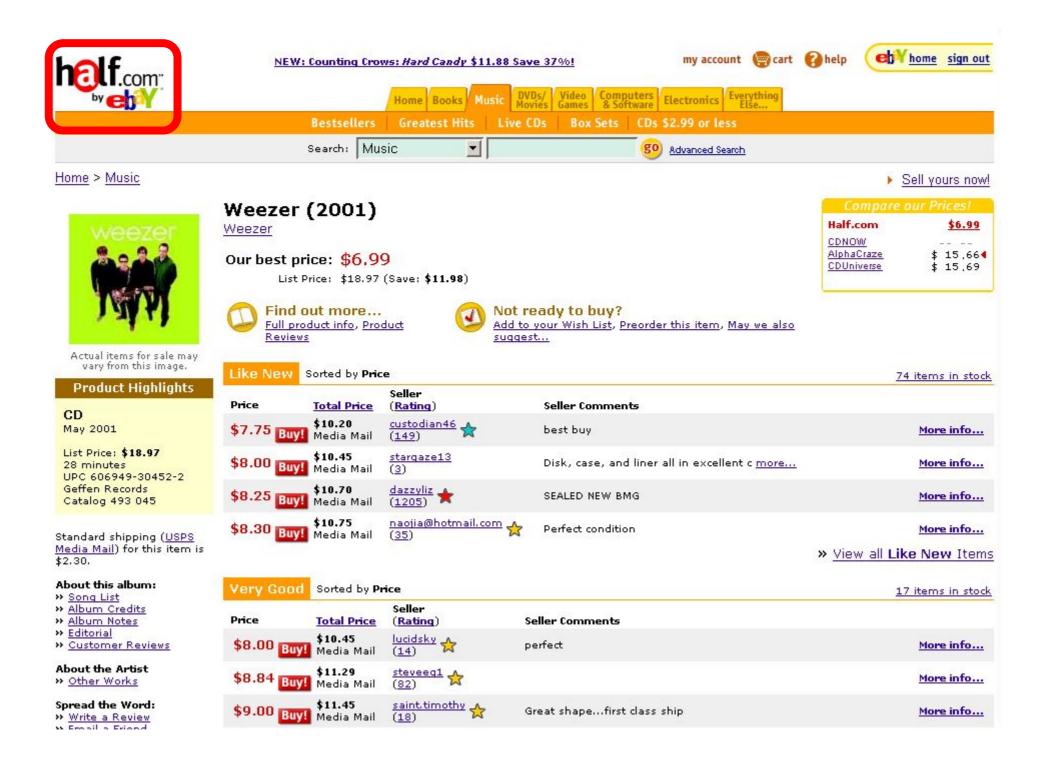
#### Gateway Desktop Under \$500 \$499.00



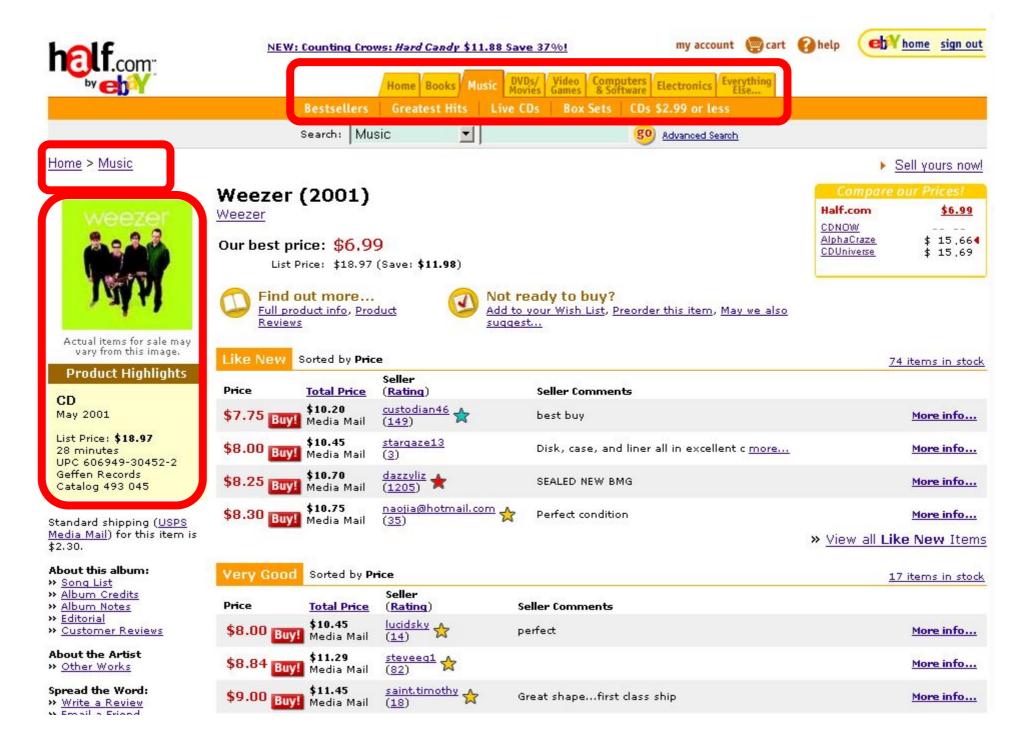
Includes a 1GHz Intel Pentium III processor, 256MB RAM, 20GB hard drive, CD-RW drive, 250MB ZIP Drive, and more!

More great deals...

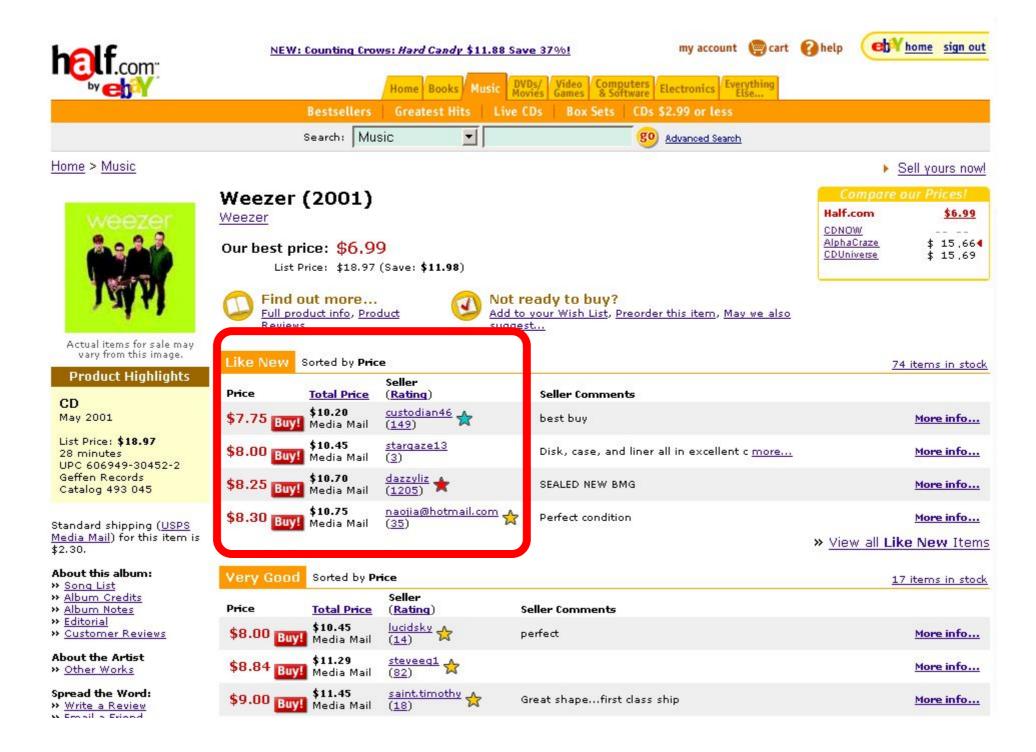
# Consistency to reinforce branding



### User location within a site



# Convey trust



### Personalized recommendations



#### About this album

#### Song List

- Don't Let Go
- 2. Photograph
- 3. Hashpipe
- 4. Island In The Sun
- 5. Crab
- 6. Knock-Down Drag-Out
- 7. Smile
- Simple Pages
- 9. Glorious Days
- 10. O Girlfriend

#### **Album Credits**

Ken Allerdyce, Engineer Ric Ocasek, Producer

### Secondary information

#### **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 - ... They are the new Cars... Alternative Press (2/02, p.65) - Ranked #13 in AP's 25 Best Albums of 2001 - ... This will either touch your heart or make you air-guitar like a beast... Rolling Stone (6/7/01, p.110) - 4 stars out of 5 - ... A totally crunk geek-punk record, buzzing through 10 excellent tunes in less than half an hour with zero filler and enough psychosexual contortions to buy leader Rivers Cuomo's shrink another hot tub... Q Magazine (8/01, p.142) - 4 stars out of 5 - ... Harks back to the keenly observed power pop of their '94 debut, and there isn't a bad apple in the bunch...

#### Customer Reviews

Rated 4.3 out of 5.0 by 29 raters.

- » Read Customer Reviews
- » Rate this item

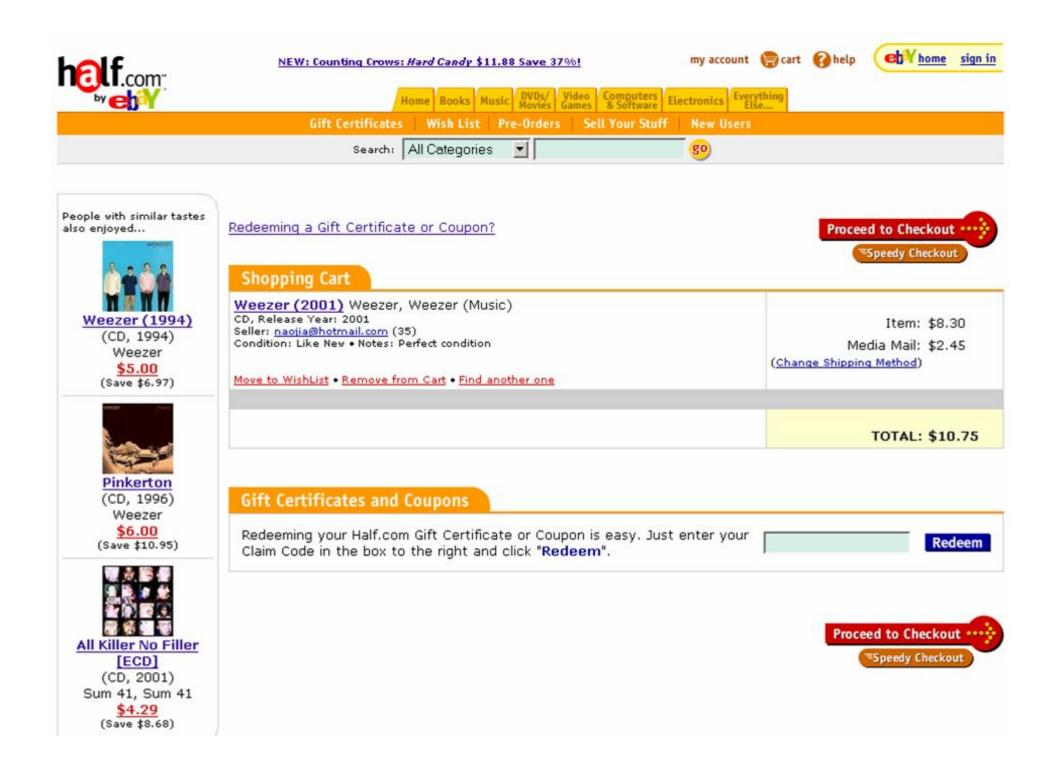
Portions of this page Copyright 1948-2001 Muze Inc. WUZE For personal non-commercial use only. All rights reserved. Provider 1

Gift Certificates | Affiliate Program | Take Five- Get \$5 for each friend you refer!

Register | Sell | My Account | Wish List / Pre-Orders | Shopping Cart | Help

Announcements | About Us | Careers | Half.com, OR

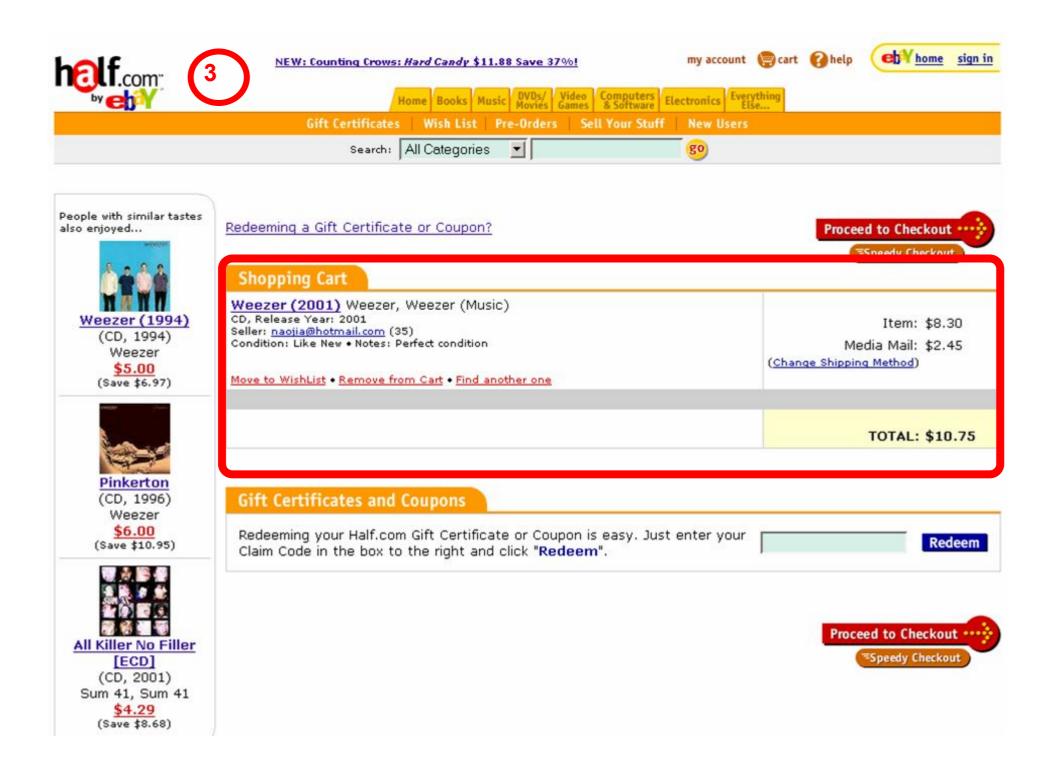
### Do we still know where we are?



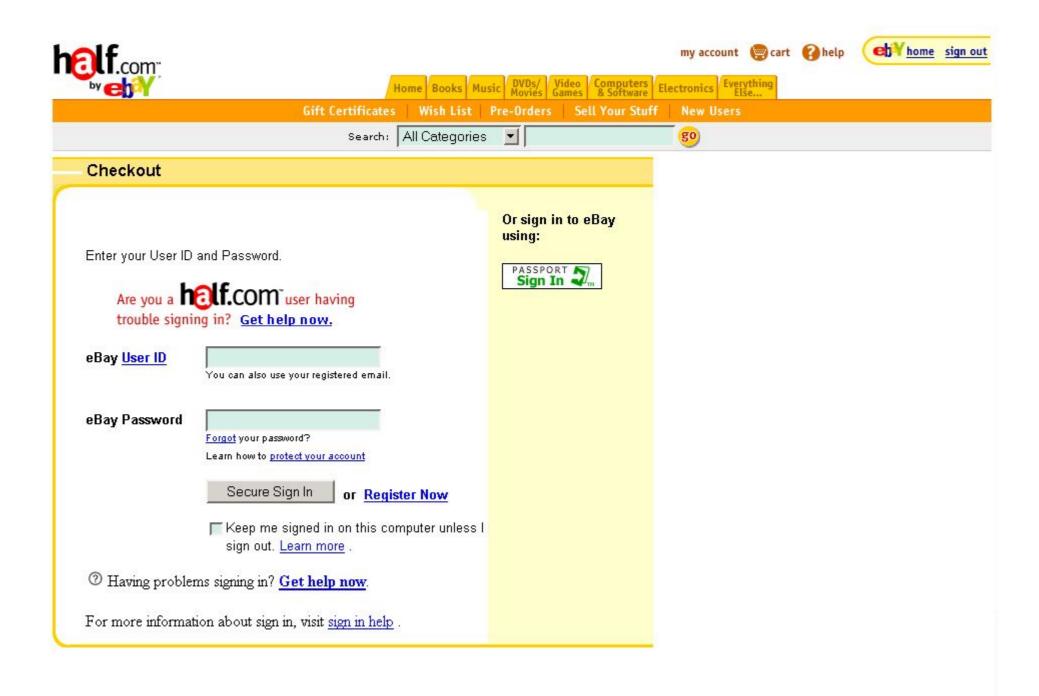
### Do we still know where we are?



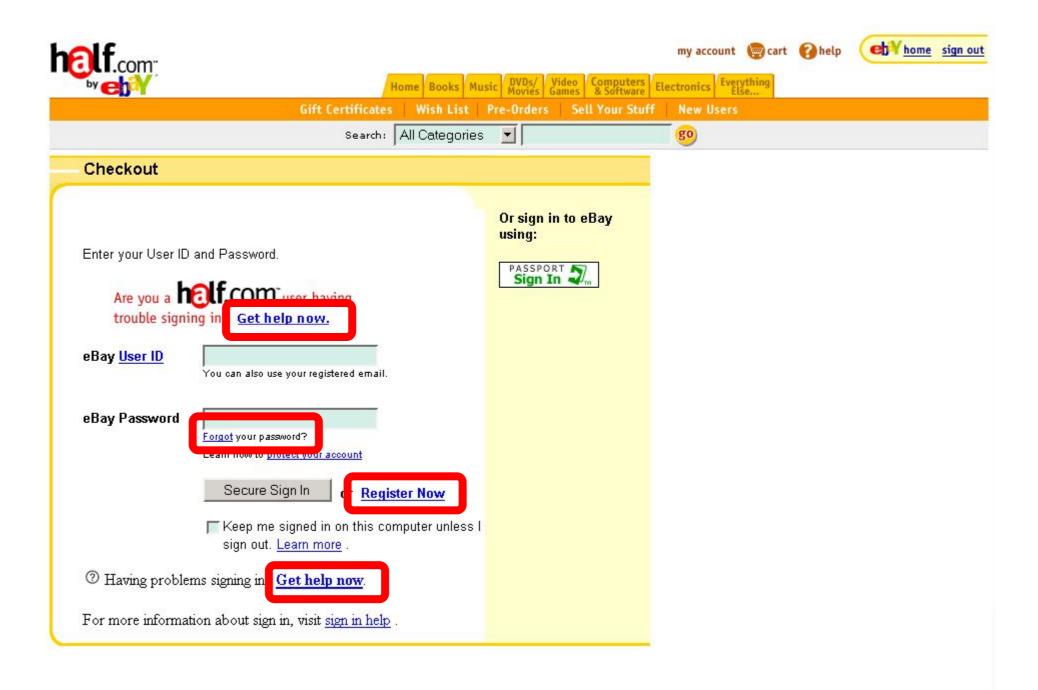
# Avoid surprises!



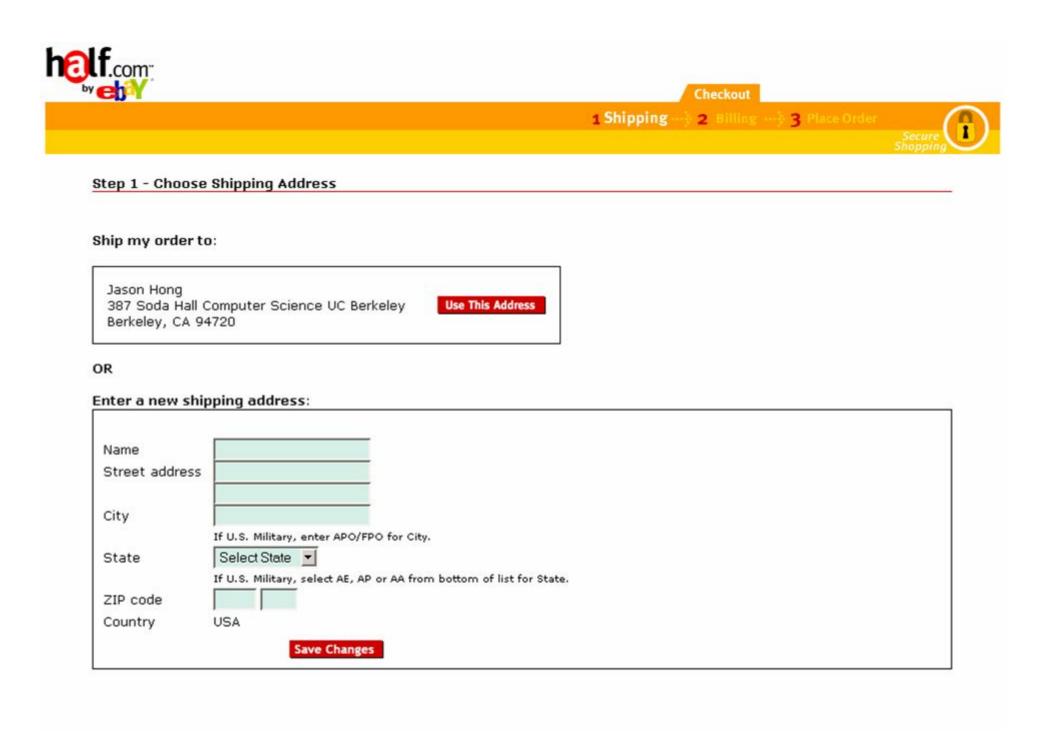
# Provide support



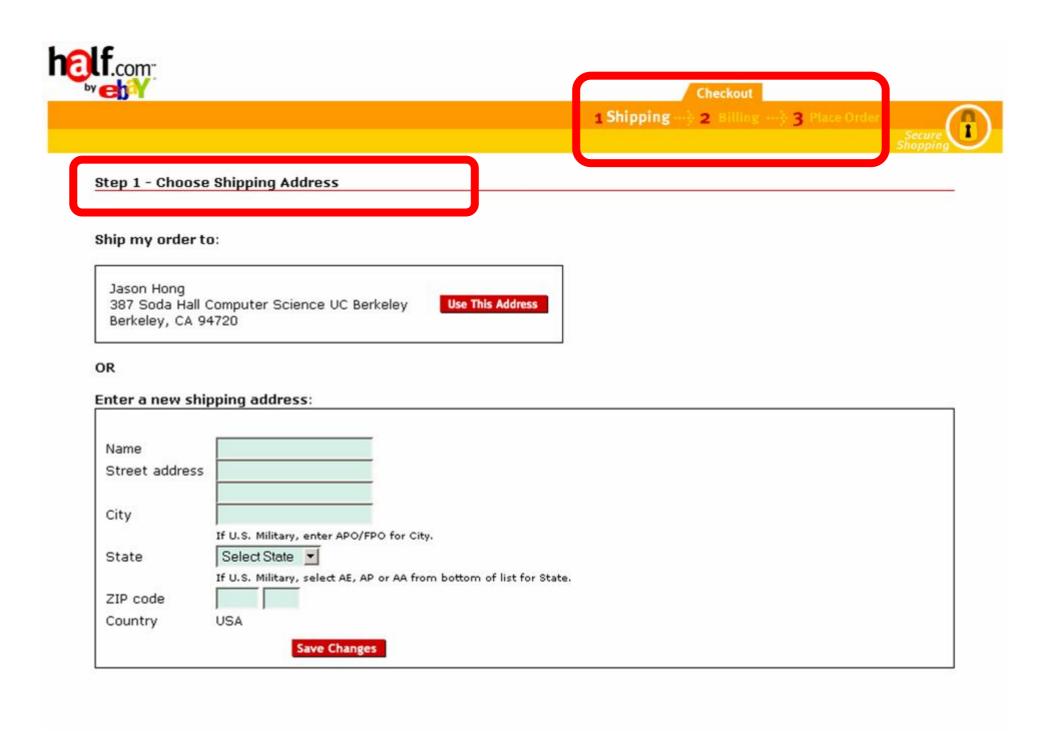
# Provide support



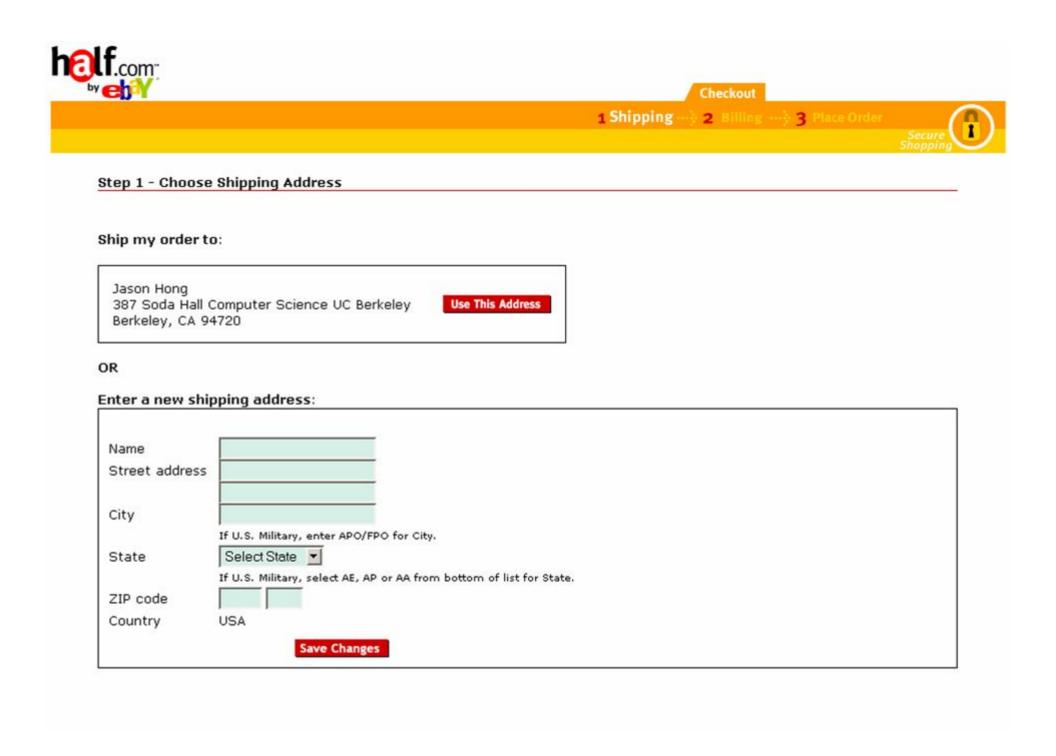
# Where am I in the process?



# Where am I in the process?

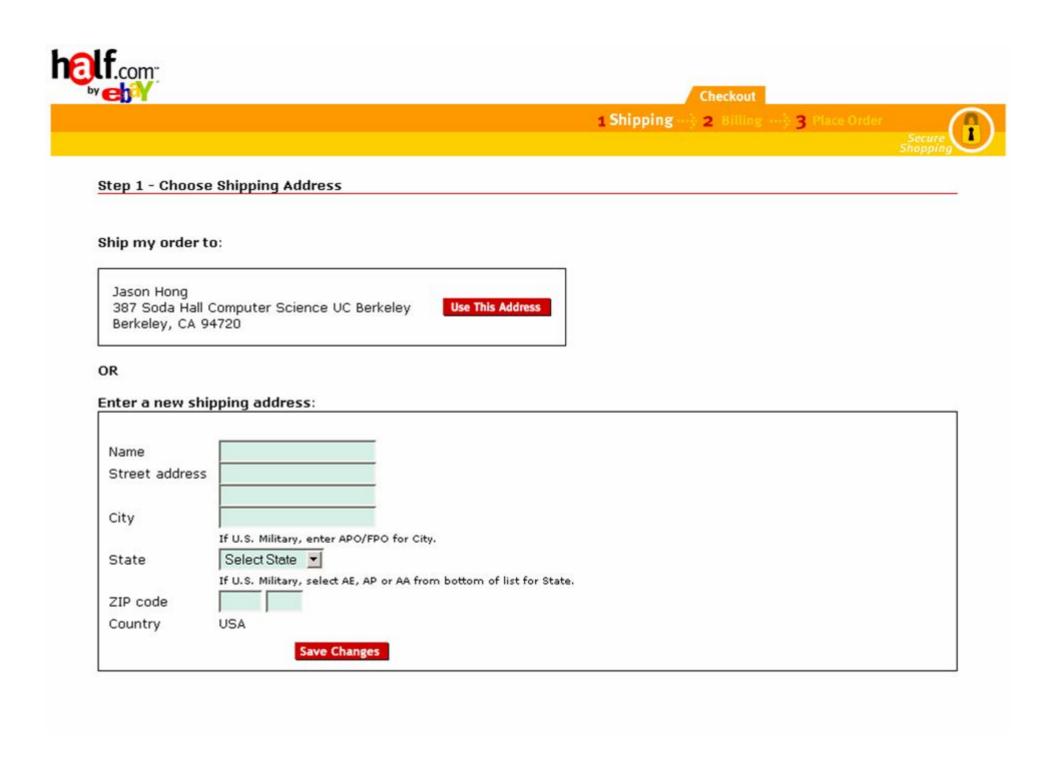


# Where am I in the process?

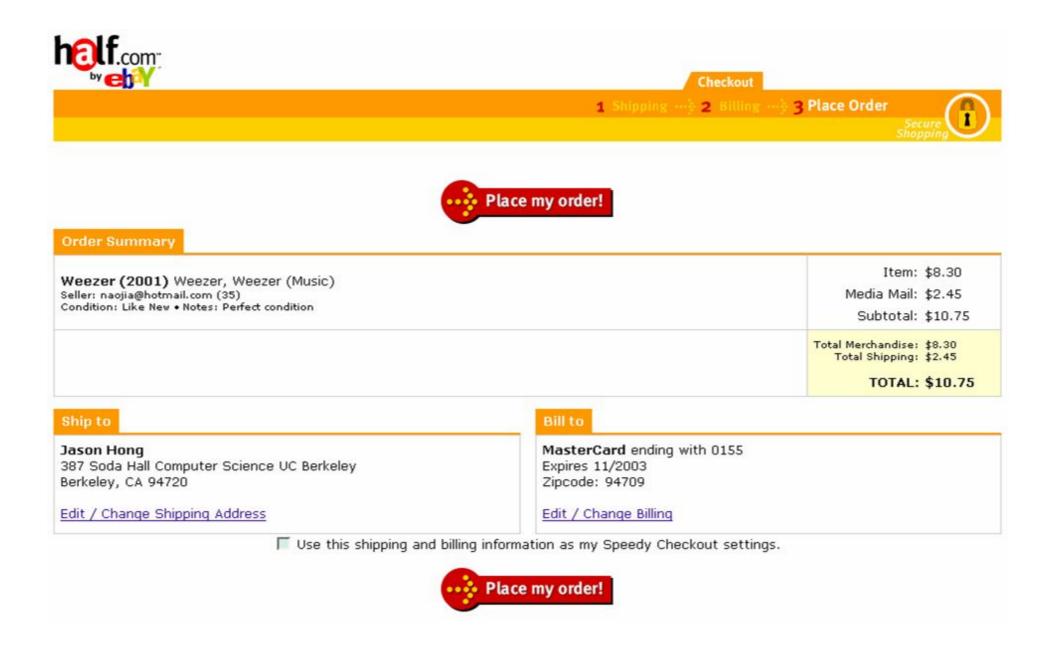


### Process funnel

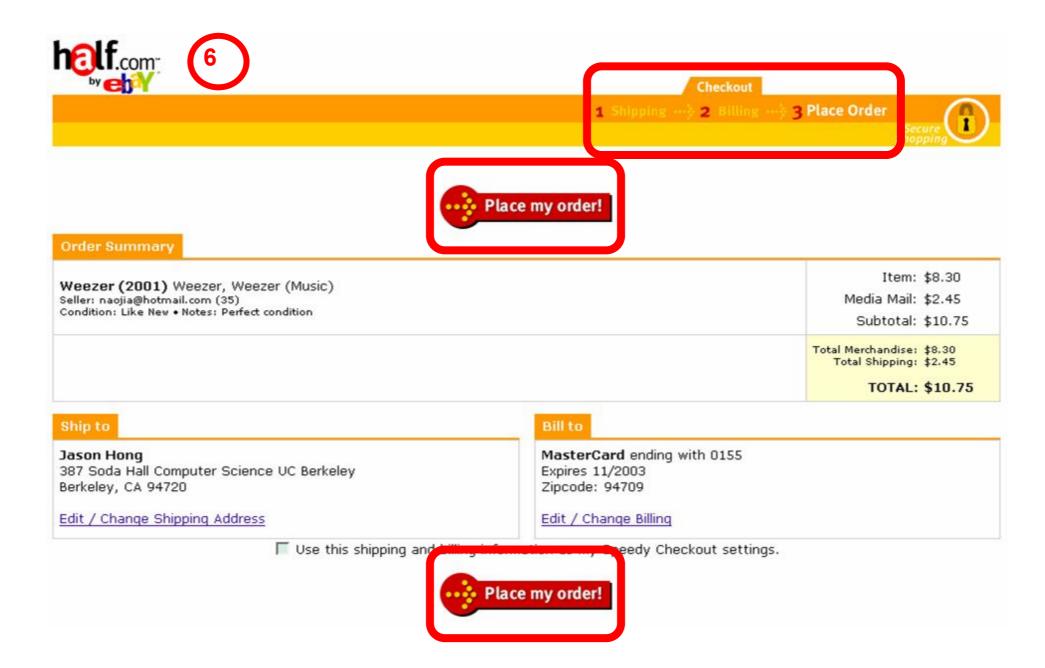
Extraneous info and links are removed to focus customers



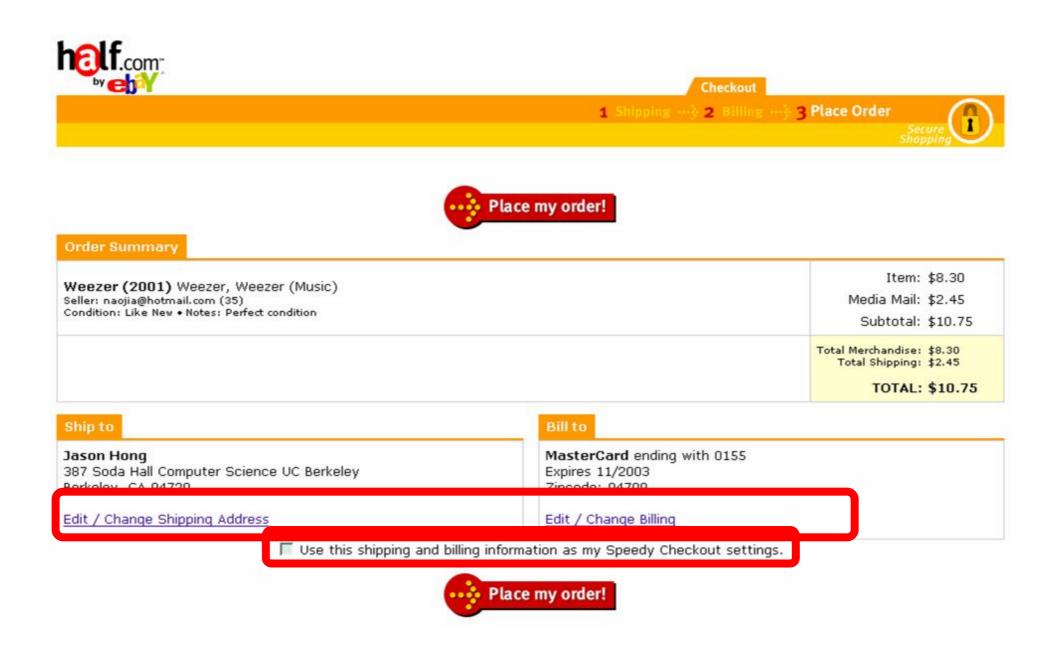
### How much more to do?



### How much more to do?



# Make it easy to sign up



Why this completed outdated example?

# Why this completed outdated example?

It's still the same today:)

# Activity

### 5min

Go to your favorite shopping site and find the differences!

# Design Equals Solutions

Design is about finding solutions

### 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

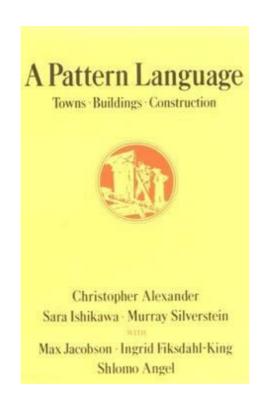
# Design Patterns

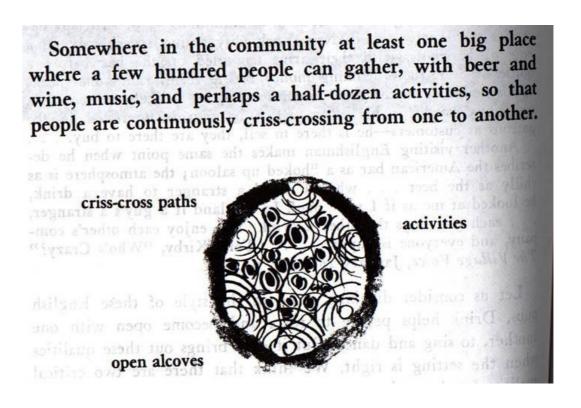
Design patterns communicate common design problems and solutions

A tool for knowledge sharing

### Design Patterns in Architecture

Design patterns communicate common design problems and solutions

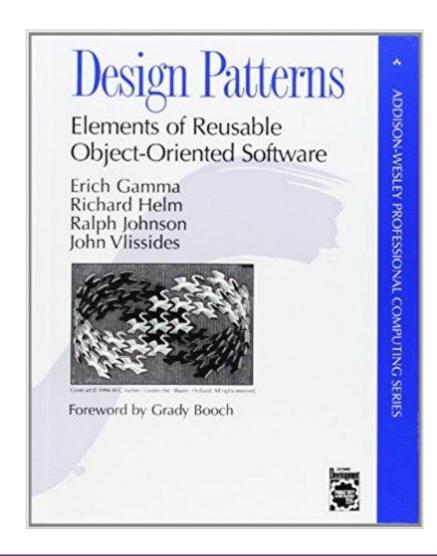




# Design Patterns in OOP and software engineering

Nice patterns for designing window-based user interfaces in Smalltalk

The Gang of Four Book!



## 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"

## 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

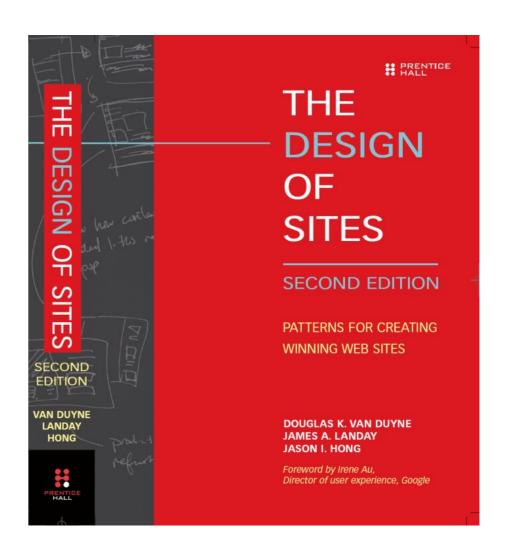
# Web Design Patterns

Communicate design problems & solutions

how to create navigation bars for finding relevant content

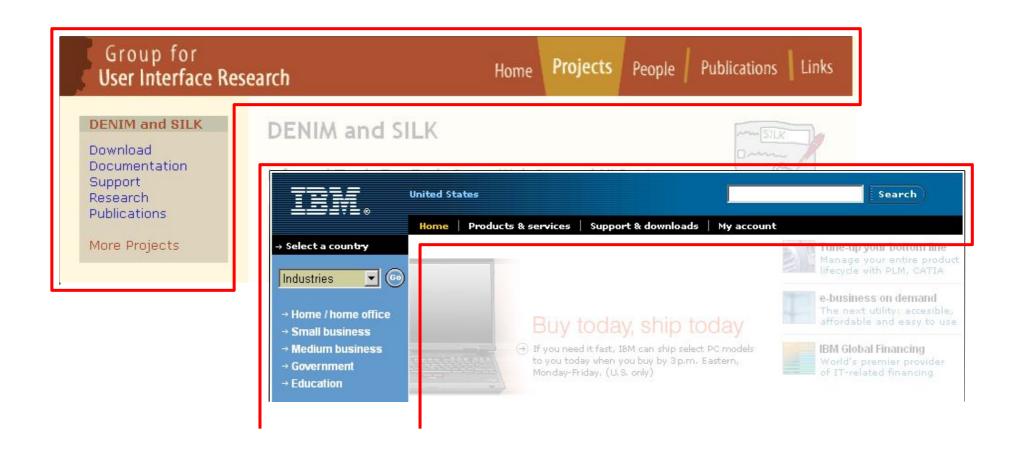
how to create a shopping cart that supports check out

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



# Navigation Bar (K2)

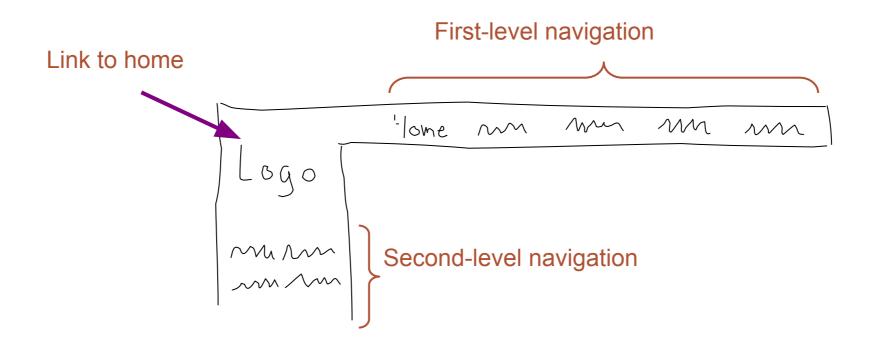
Problem: Customers need a structured, organized way of finding the most important parts of your Web site



# Navigation Bar (K2)

### Solution diagram

Captures essence on how to solve problem



## Patterns Support Creativity

### Patterns come from successful examples

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

```
Principles?
   patterns are not that general
Guidelines?
   patterns discuss trade-offs,
  show good examples, and tie to other patterns
Style guides?
   patterns are not too specific,
   can be specialized to a design
Templates?
   patterns illustrate flows and relationships among pages
```

Patterns help design without over-constraining

### **UI Pattern Form**

**Problem**: Problems are related to the usage of the system and are relevant to the user or any other stakeholder that is interested in usability.

**Use when**: a situation (in terms of the tasks, the users and the context of use) giving rise to a usability problem.

**Principle**: a pattern is usually based on one or more ergonomic principles such as user guidance, or consistency, or error management.

**Solution**: a proven solution to the problem.

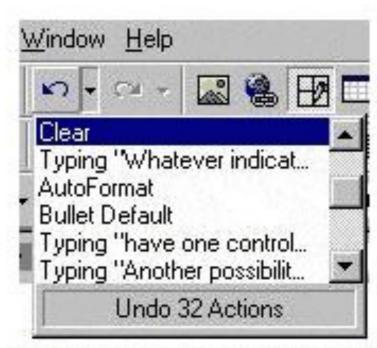
**Why**: How and why the pattern actually works, including an analysis of how it may affect certain attributes of usability.

**Examples**: Each example shows how the pattern has been successfully applied in a real life system. This is often accompanied by a screenshot and a short description.

Implementation: Some patterns provide implementation details.

Kruschitz, Christian, and Martin Hitz. "Human-Computer Interaction Design Patterns: Structure, Methods, and Tools." *International Journal on Advances in Software Volume 3, Number 1 & 2, 2010* (2010).

https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/interac



Undo in Microsoft Word using a visualization of the command queue



Author Martijn van Welie http://www.welie.com/patterns/gui/undo.html

Problem

Users do actions they later want reverse because they realized they made a mistake or because they changed their mind.



#### Use when

You are designing a desktop or web-based application where users can manage information or create new artifacts. Typically, such systems include editors, financial systems, graphical drawing packages, or development environments. Such systems deal mostly with their own data and produce only few non-reversible side-effects, like sending of an email within an email application. Undo is not suitable for systems where the majority of actions is not reversible, for example, workflow management systems or transaction systems in general.

Both novice and expert users may want to reverse their actions, either because of mistakes or changes in intention. Expert users may want to use the history of their actions for more specific manipulation of the data in the application. For example, in a graphical modeling application, users may want to undo work on some specific object while keeping later work done on other objects.



#### Solution

Maintain a list of user actions and allow users to reverse selected actions.

Each 'action' the user does is recorded and added to a list. This list then becomes the 'history of user actions' and users can reverse actions from the last done action to the first one recorded. This is also called a Linear Multi-level Undo.



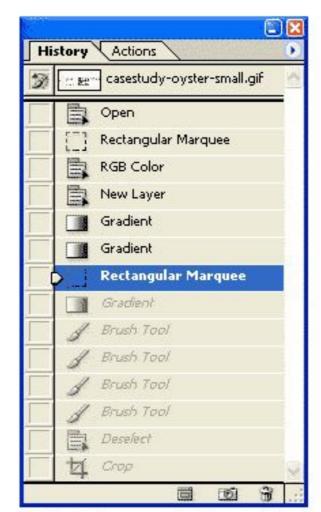
Why

Offering the possibility to always undo actions gives users a comforting feeling. It helps the users feel that *they* are in control of the interaction rather than the other way around. They can explore, make mistakes and easily go some steps back, which facilitates learning the application's functionality. It also often eliminates the need for annoying warning messages since most actions will not be permanent

#### Examples



As in all MS Office applications, in Word 2000 the users can see the history of their actions and undo one or more of them. The actions are briefly described and the users can select a range of actions to be undone. After selecting undo, users can even redo the actions.



In Photoshop a selective undo is also possible. By moving the slider, users can do the normal multi-level undo but they can also drag an action into the trashcan and thereby do a selective undo.

Operations that depended on that action are automatically deleted as well of they are not relevant anymore.



Undo in Microsoft Word using a visualization of the command queue

#### Implementation

Most implementations of multi-level undo are based on the Command (Gamma et al 1995) pattern. When using the Command pattern, most functionality is encapsulated in Command objects rather than in other controlling classes. The idea is to have a base class that defines a method to "do" a command, and another method to "undo" a command. Then, for each command, you derive from the command base class and fill in the code for the do and undo methods. The "do" method is expected to store any information needed to "undo" the command. For example, the command to delete an item would remember the content of the item being deleted.

### More examples

### Captcha

#### Problem

The application needs confirmation that the action that is about to happen is done by a human rather than an automated machine

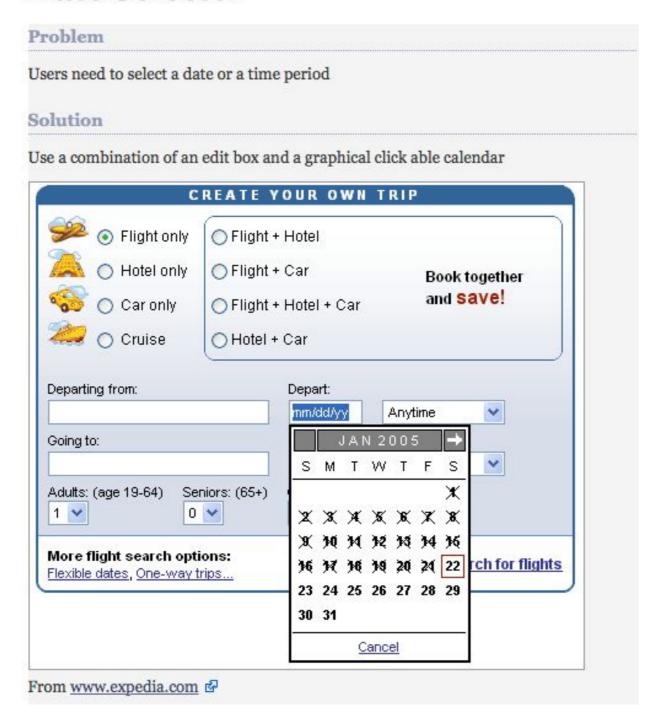
#### Solution

Present users with a mangled image containing numbers and letters that humans can still 'decipher' but is hard for machines to read.



## More examples

#### **Date Selector**



### Pre-patterns

### Patterns require broad adoption and examples

Many version 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

### Pre-patterns and Anti-patterns

When you see advice, consider its depth

Result of an individual study

Pre-pattern based on some meta-analysis

Established pattern

Be aware of misapplying patterns

And be aware of anti-patterns

### Dark Patterns

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

Example: 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 design that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

Example: 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 design that has been carefully crafted to trick people into doing things, such as buying insurance with their purchase or signing up for recurring bills.

#### Example: Disguised Ads

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

#### Example: Friend Spam

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

### Dark Pattern s

nonc

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

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

5 108 853 12K 15K

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 dopens of follow-up emails, inviting you to "expand your professional network." Even worse, they're sintually impossible to optout of it's a scurreny use of dark UK patterns by a company that should know better. Now, Linkedin is going to be paying for it as part of a class-action lawout, to the turse of \$13 million.



Presented in San Jose's U.S. District Court, the key issue in Perkins a: Linkeolin is spam. Namely, during the user sign-up process, Linkeolin claims that it "will not store your password or email anyone without your permission." Despite this, Linkeolin sends automated follow-up amail 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 his deemed this illegal.

Consequently, if you were a member of Linkedin's 'add connection' program between September 2011 and October 2004, you can submit a claim to get a payout.

### EVID3NCE

WHAT THE SCIEDCE HAS TO SAY ABOUT DESIGN, CREATHFITY, INNOVATION, AND VISUAL COLTURE.

MIND MORE -

O Google Goes Analog With its New Note-Taking Tools

Will Plat Design Sizer Die?

This Note-Taking System Turns You Into An Efficiency Expert

S Sedical Ideas To Totally Disnypl Air Travel

 Ut. Ut: Who Does What? A Designar's Guide To The Tech Industry

### Pattern exercise

In groups of two, read and answer the handout.

(Submit a PDF with your answers to CANVAS.)

# Ask me something!