

CS 321: Introduction to HCI

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 21:
Patterns

Eren Gultepe

Patterns

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

Patterns

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\$7.75 Buy!	\$10.20 Media Mail	custodian46 (149) ★
\$8.00 Buy!	\$10.45 Media Mail	starqaze13 (3)
\$8.25 Buy!	\$10.70 Media Mail	dazzyliz (1205) ★
\$8.30 Buy!	\$10.75 Media Mail	naojia@hotmail.co (35)

Very Good

Sorted by Price

Price	Total Price	Seller (Rating)
\$8.00 Buy!	\$10.45 Media Mail	lucidsky (14) ★
\$8.84 Buy!	\$11.29 Media Mail	steveeq1 (82) ★
\$9.00 Buy!	\$11.45 Media Mail	saint.timothy (18) ★

half.com by **ebay**

Checkout

1 Shipping → 2 Billing → 3 Place Order 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

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

State

If U.S. Military, select AE, AP or AA from bottom of list for State.

ZIP code

Country

Save Changes

Process funnel

Extraneous info and links are removed to focus customers

half.com™ by ebay

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

my account cart help

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

Bestsellers Greatest Hits Live CDs Box Sets CDs \$2.99 or less

Search: Music GO Advanced Search

Home > Music Sell yours now!

Compare our Prices!

Half.com	\$6.99
----------	--------

half.com™ by ebay

Checkout

1 Shipping → 2 Billing → 3 Place Order

Secure Shopping

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State

If U.S. Military, select AE, AP or AA from bottom of list for State.

ZIP code

Country USA

Save Changes

Why this completed outdated example?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 Equals Solutions

Designers often reinvent

Hard to know how things were done before

Why things were done a certain way

How to reuse solutions

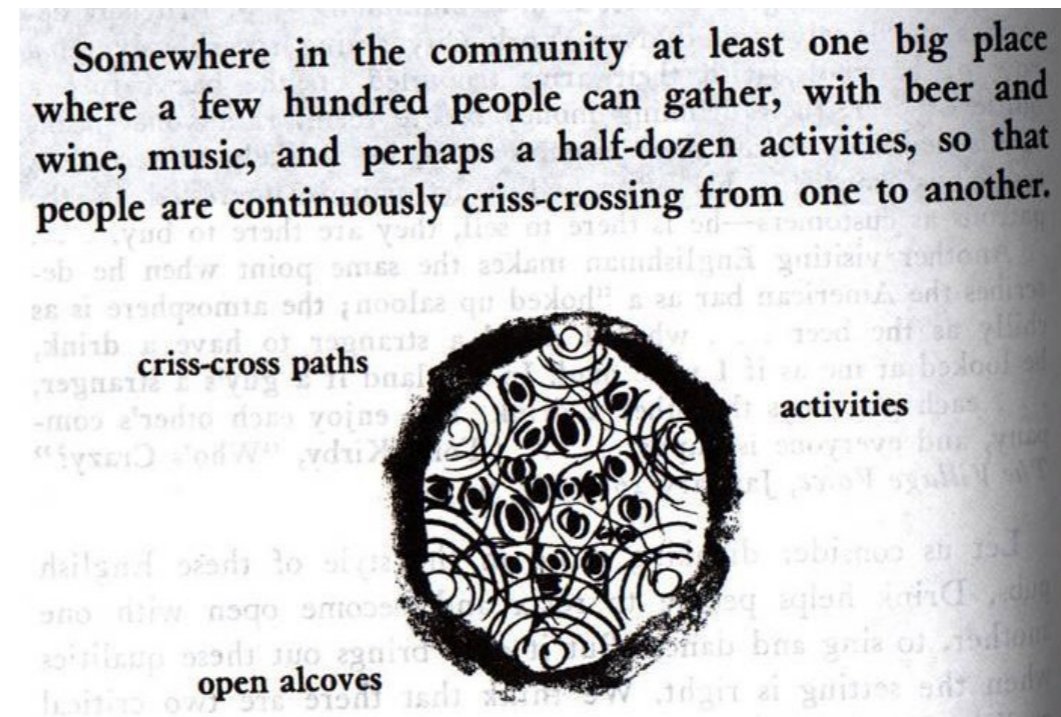
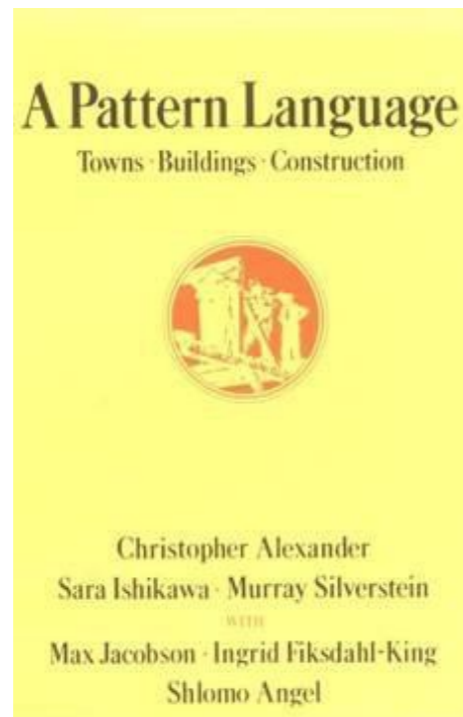
Design Patterns

Design patterns communicate common design problems and solutions

A tool for knowledge sharing

Design Patterns in Architecture

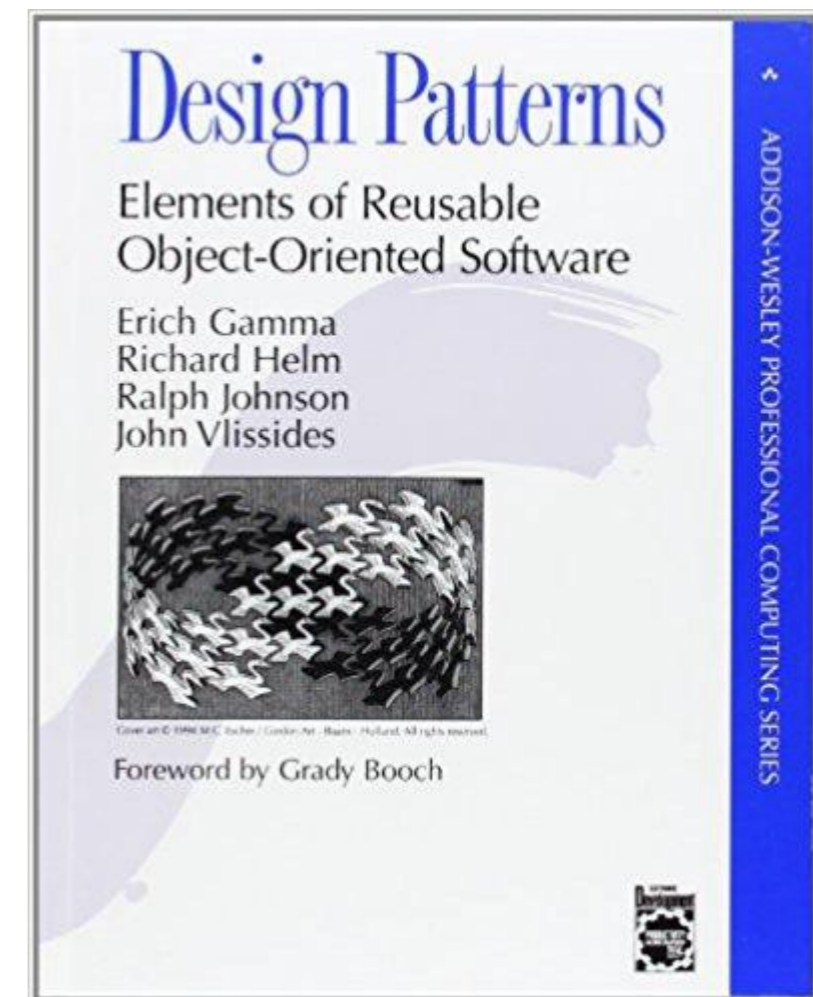
Design patterns communicate common design problems and solutions



Design Patterns in OOP and software engineering

Nice patterns for creating reusable OO software.

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”

Design patterns are a language

For sharing the key elements of a solution

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



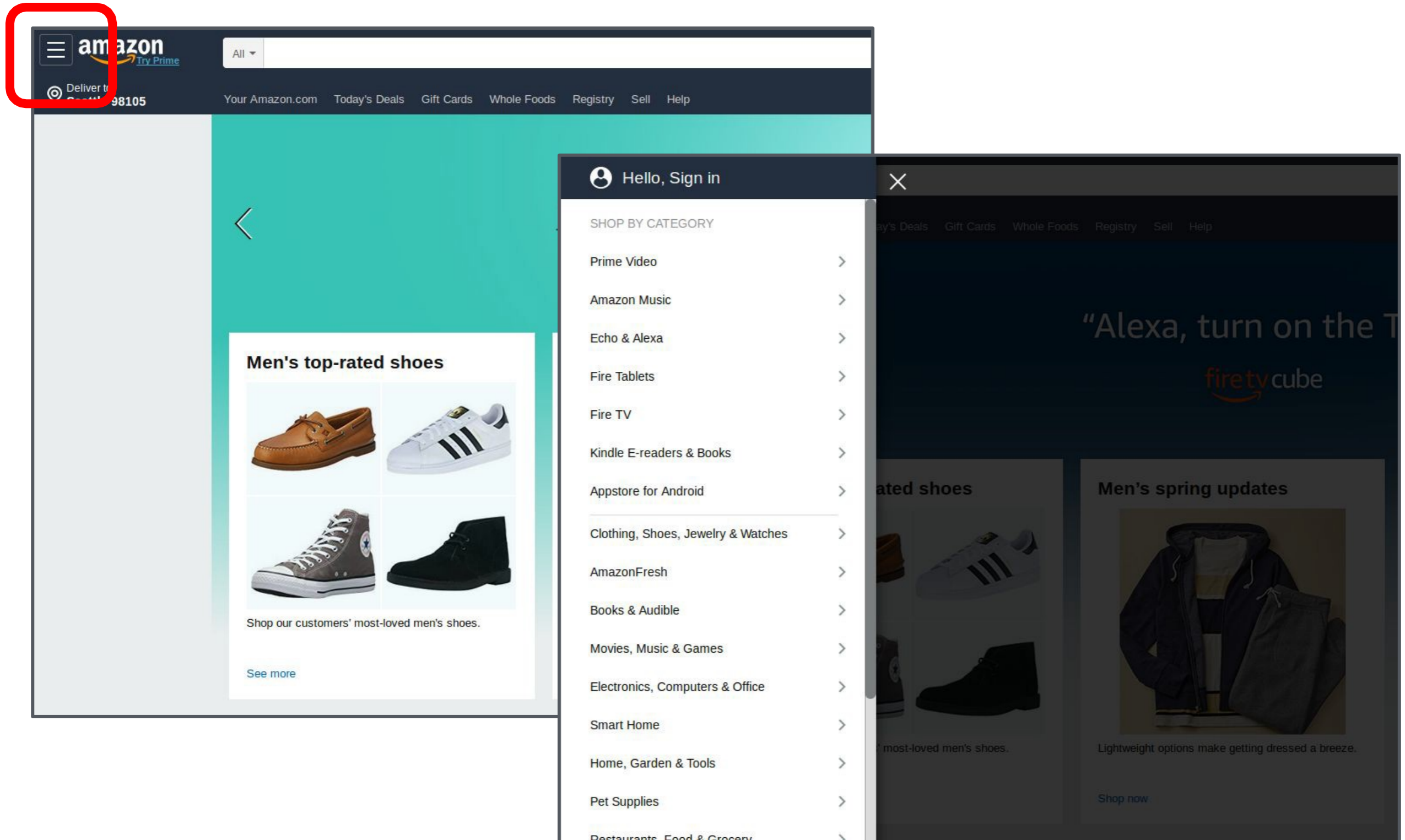
Navigation Bar (K2)

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

The image shows a screenshot of a website navigation bar with several red boxes highlighting specific areas:

- Top Navigation Bar:** A dark brown bar with the text "Group for User Interface Research" on the left and "Home | Projects | People | Publications | Links" on the right. The "Projects" link is highlighted in a lighter brown color.
- Left Sidebar:** A light yellow box containing the text "DENIM and SILK" and a list of links: "Download", "Documentation", "Support", "Research", "Publications", and "More Projects".
- Main Content Area:** A large blue box containing the IBM logo, the text "United States", a search bar with a "Search" button, and a navigation menu with links: "Home", "Products & services", "Support & downloads", and "My account". Below this is a "Select a country" section with a dropdown menu for "Industries" and a "Go" button. A list of industry links is shown: "Home / home office", "Small business", "Medium business", "Government", and "Education".
- Bottom Section:** A white box containing a promotional banner for "Buy today, ship today" with a laptop image and a text box stating: "If you need it fast, IBM can ship select PC models to you today when you buy by 3 p.m. Eastern, Monday-Friday, (U.S. only)". To the right of the banner are three promotional cards: "Fine-up your bottom line", "e-business on demand", and "IBM Global Financing".

Hamburger Menu



Patterns Support Creativity

Patterns come from successful examples

So successful that lots of people are familiar with their paradigms, interaction, techniques, and metaphors makes it 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.

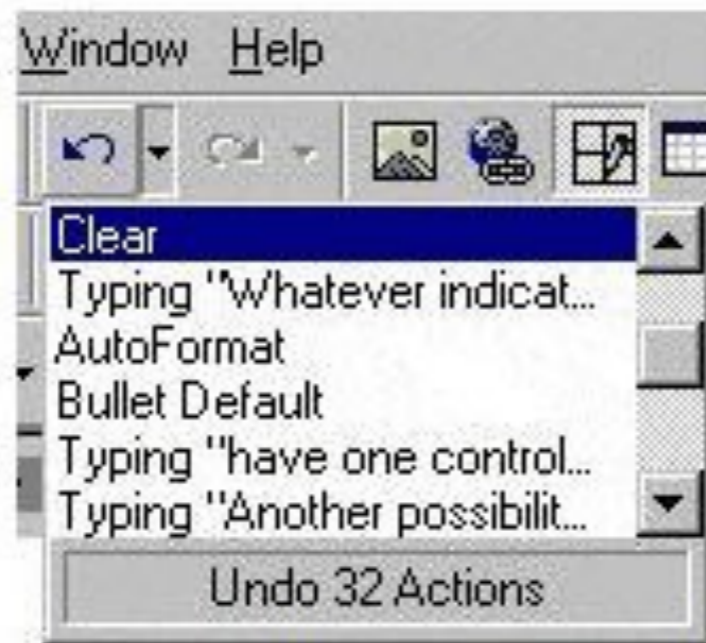
Why: How and why the pattern actually works, including an analysis of how it may affect certain attributes of usability.

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.

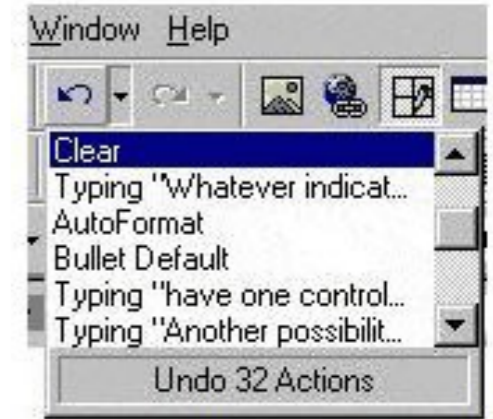
- Kruschitz, Christian, and Martin Hitz. "Human-Computer Interaction Design Patterns: Structure, Methods, and Tools." *International Journal on Advances in Software Volume 3, Number 1 & 2, 2010* (2010).
- <https://www.interaction-design.org/literature/book/the-glossary-of-human-computer-interaction/interaction-design-patterns>

Example of a UI pattern



Undo in Microsoft Word using a visualization of the command queue

Example of a UI pattern



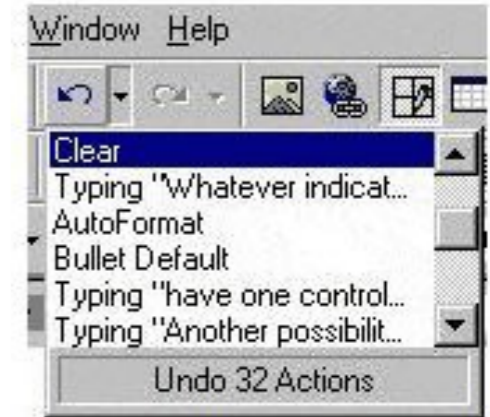
Author

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.

Example of a UI pattern

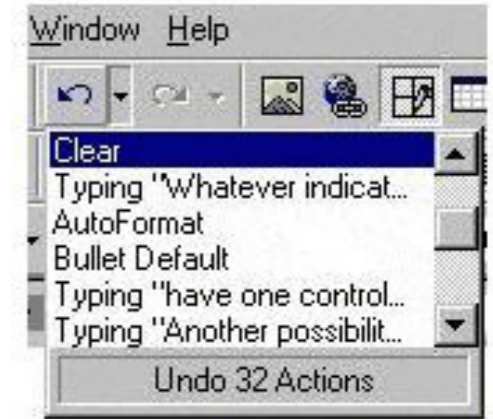


Use when

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.

Example of a UI pattern

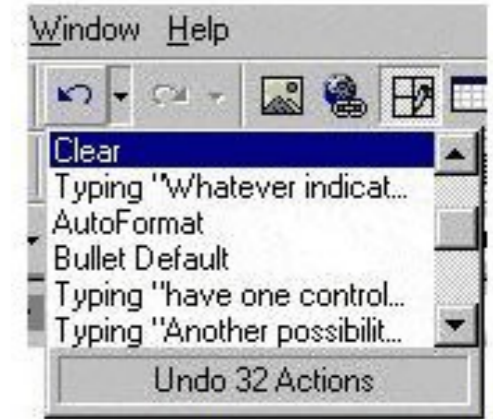


Solution

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.

Example of a UI pattern

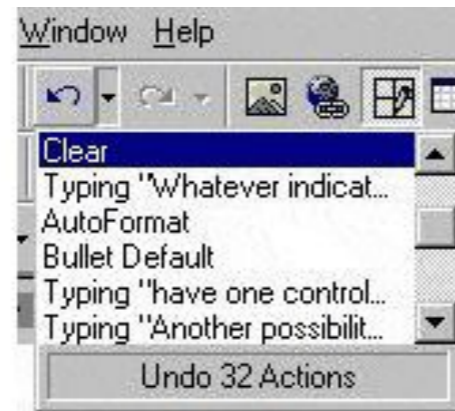


Why

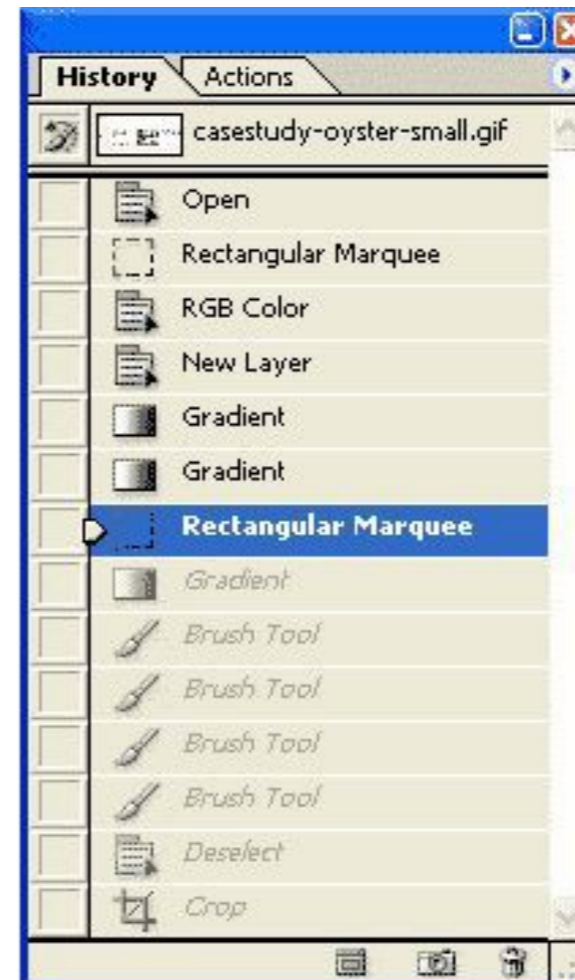
Offering the possibility to always undo actions gives users a comforting feeling. It helps the users feel that *they* are in control of the interaction rather than the other way around. They can explore, make mistakes and easily go some steps back, which facilitates learning the application's functionality.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

Example of a UI pattern

Examples

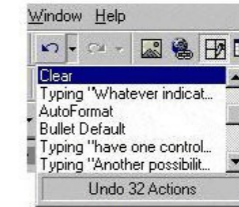


As in all MS Office applications, in Word 2000 the users can see the history of their actions and undo one or more of them. The actions are briefly described and the users can select a range of actions to be undone. After selecting undo, users can even redo the actions.



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.

Example of a UI pattern



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

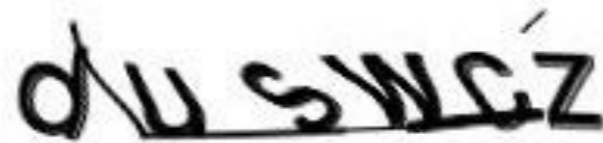
Present users with a mangled image containing numbers and letters that humans can still 'decipher' but is hard for machines to read.

Verify Your Registration

* Enter the code shown:

[More info](#) 

This helps Yahoo! prevent automated registrations.



More examples

Date Selector

Problem

Users need to select a date or a time period

Solution

Use a combination of an edit box and a graphical click able calendar

CREATE YOUR OWN TRIP

Flight only Flight + Hotel
 Hotel only Flight + Car
 Car only Flight + Hotel + Car
 Cruise Hotel + Car

Book together and save!

Departing from:

Depart:

Going to:

Adults: (age 19-64) Seniors: (65+)

More flight search options:
[Flexible dates](#), [One-way trips...](#)

JAN 2005

S	M	T	W	T	F	S
						X
X	X	X	X	X	X	X
X	10	11	12	13	14	16
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

From www.expedia.com

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

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.

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 Patterns

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.

11 5 100 853 1.2K 1.5K
NOTES TAGS ALIEN SHARK TRACT LAD

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: [Shutterstock](#)

Presented in San Jose's U.S. District Court, the key issue in *Perkins v. LinkedIn* is clear. 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.

EVIDENCE

WHAT THE SCIENCE HAS TO SAY ABOUT DESIGN, CREATIVITY, INNOVATION, AND VISUAL CULTURE.

READ MORE »

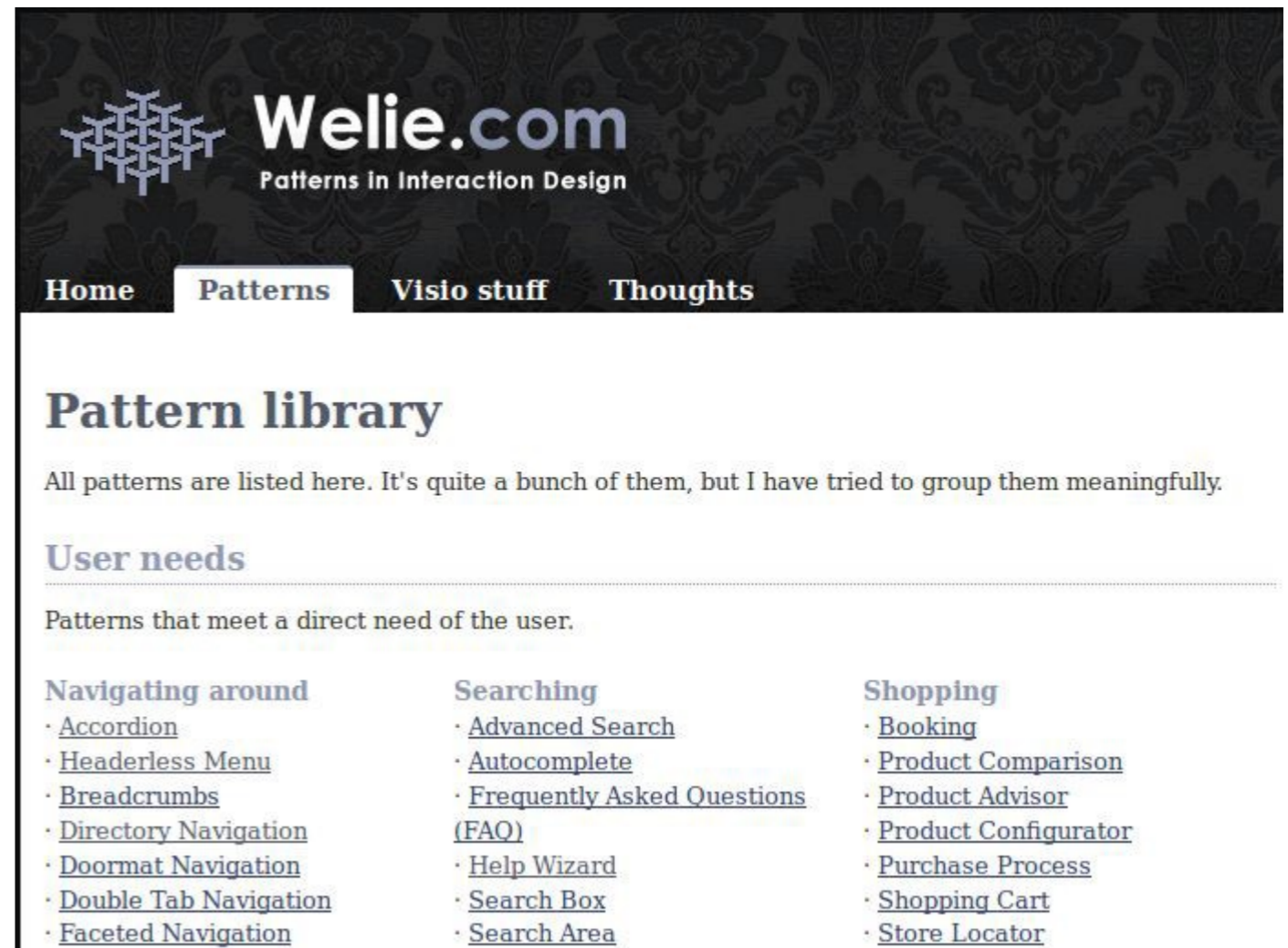
TRENDING

HAPPENING NOW

- 1 Google Goes Analog With Its New Note-Taking Tools
- 2 Will Flat Design Ever Die?
- 3 This Note-Taking System Turns You Into An Efficiency Expert
- 4 5 Radical Ideas To Totally Disrupt Air Travel
- 5 UI/UX: Who Does What? A Designer's Guide To The Tech Industry

Pattern exercise

Let's review websites with an eye on design patterns:



The screenshot shows the Welie.com website with a dark background and a repeating floral pattern. The logo 'Welie.com' is in the top left, with the tagline 'Patterns in Interaction Design' below it. A navigation bar contains links for 'Home', 'Patterns', 'Visio stuff', and 'Thoughts'. The main content area is titled 'Pattern library' and includes a paragraph explaining the list. Below this, there is a section for 'User needs' with a list of patterns grouped into three categories: Navigating around, Searching, and Shopping.

Welie.com
Patterns in Interaction Design

[Home](#) [Patterns](#) [Visio stuff](#) [Thoughts](#)

Pattern library

All patterns are listed here. It's quite a bunch of them, but I have tried to group them meaningfully.

User needs

Patterns that meet a direct need of the user.

Navigating around <ul style="list-style-type: none">· Accordion· Headerless Menu· Breadcrumbs· Directory Navigation· Doormat Navigation· Double Tab Navigation· Faceted Navigation	Searching <ul style="list-style-type: none">· Advanced Search· Autocomplete· Frequently Asked Questions (FAQ)· Help Wizard· Search Box· Search Area	Shopping <ul style="list-style-type: none">· Booking· Product Comparison· Product Advisor· Product Configurator· Purchase Process· Shopping Cart· Store Locator
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