Design Patterns

刘哲明
Prof. James A. Landay
Computer Science Department
Stanford University

Autumn 2023
November 27, 2023
Hall of Fame or Shame?

Southwest.com

Special Offers
Great Travel Deals

Air Hotel Car Vacations

Flying Southwest
What to Know Before You Go

Rapid Rewards
Earn Rewards, Flights Faster

Check In
Change Flight
Check Flight Status

Account Log In
Password
Need help logging in?
Remember Me

Book Now

Get 2 Roundtrip Flights
+ 6,000 Anniversary Points
+ No Foreign Transaction Fees
+ Additional Points for Southwest Purchases

Get EarlyBird Check-in

Southwest.com

Autumn 2023
Hall of Fame or Shame?

Hurry before they're going, going, gone.
One-Way As Low As
$69

Get 2 Roundtrip Flights
+ 5,000 Anniversary Points
+ No Foreign Transaction Fees
+ Additional Points for Southwest Purchases

Search Southwest.com
Hall of Shame!

Southwest.com

- hard to notice key functions on far right
- ads dominating the screen
Improved southwest.com

Wanna get away® with low fares?
From San Jose, CA

$69

One-way as low as*

Book now

*Seats/day/flight/limit/restricted. apply. First travel date available 1/1/2024 with 10 travel days in schedule.

TRAVEL ADVISORY: Busy Thanksgiving Travel

Flight | Hotel | Car | Vacations

Recent searches

DEPART | ARRIVE | DEPART DATE | RETURN DATE | PASSENGERS

SJC | SJC | 11/27 | 11/30 | 1

Baggage and optional fees

Dollars | Points

Search
Hall of Fame or Shame?

Wiimote
By Nintendo
Great at opening up gaming to a wider audience but...

the main thing that differentiated the product (movement in gaming) resulted in it being thrown at windows/TVs

- slippery plastic hard to hold. Later designs added rubber case & strap
- lack of a joystick was initial problem resulting in a second controller
Design Patterns

刘哲明
Prof. James A. Landay
Computer Science Department
Stanford University

Autumn 2023
November 27, 2023
Outline

• Detailed Design Example
• Web Design Patterns
• Patterns in the Design Exploration Phase
• Dark Patterns
Find things you'll love. Support independent sellers. Only on Etsy.

Popular gifts right now

- **Valentines Day Gift for Him, Personalized Wallet, Mens Personalized wallet**
  - Rating: ★★★★★ (20,991)
  - Price: $19.99 (was $49.98, 60% off)
  - FREE shipping

- **Vitamin Me Daily Dose of Love: Cute Gift for Him, Anniversary Gift**
  - Rating: ★★★★★ (3,883)
  - Price: $24.99 (was $44.99, 40% off)

- **Heart Keychain Set - Made with Authentic LEGO® Bricks, Unique Valentine's Day Gift**
  - Rating: ★★★★★ (4,216)
  - Price: $8.38 (was $16.76, 50% off)
  - FREE shipping

- **Romantic Personalized Record - Birthday Gift for Her - Romantic Gift for Boyfriend**
  - Rating: ★★★★★ (1,942)
  - Price: $22.99 (was $45.99, 50% off)

- **Valentines Day Gift for Him, Wood Watch, Personalized Wood Watch, Mens Gift**
  - Rating: ★★★★★ (11,338)
  - Price: $49.99 (was $99.99, 50% off)
Valentines Day Gift for Him, Wood Watch, Personalized Watch, Engraved Watch, Wooden Watch, Groomsman Watch, Mens Watch, Boyfriend Gift, Gift for Dad

Stayfineofficial

$49.99+

Would you like to engrave?

Select an option

Add your personalization
Example only:
Engrave: I love you to the moon and back!
"no engraving" if you choose "no engraving" option

Add to cart
Valentines Day Gift for Him, Wood Watch, Personalized Watch, Engraved Watch, Wooden Watch, Groomsmen Watch, Mens Watch, Boyfriend Gift, Gift for Dad

Stayfineofficial

11,338 reviews ★★★★★

Buyers are raving! Multiple people gave 5-star reviews to this shop in the past 7 days.

Would you like to engrave?

No Thanks!

Add your personalization

Example only:

Engrave: I love you to the moon and back!

"no engraving" if you choose "no engraving" option

You are my Analog!
Valentines Day Gift for Him, Wood Watch, Personalized Watch, Engraved Watch, Wooden Watch, Groomsman Watch, Mens Watch, Boyfriend Gift, Gift for Dad

$49.99

Would you like to engrave?

No Thanks!

Add your personalization
Example only:
Engrave: I love you to the moon and back!
"no engraving" if you choose "no engraving" option

You are my Analog!

Add to cart

11,338 reviews ★★★★★

Buyers are raving! Multiple people gave 5-star reviews to this shop in the past 7 days.
Sign in

For your security, we ask for a security code for new device sign ins. You should be receiving a six digit security code at landay@gmail.com. It may take a few minutes.

If you still cannot find the code, please check any spam or trash folders for the code.

Security Code

Stay signed in

Sign in

Resend security code
Choose a shipping address

Default
James Landay
STANFORD, CA 94305
United States

Add a new address

Ship here

Edit
Delete
Choose a payment method

You will not be charged until you review this order on the next page.

- Default
  - Visa
  - Exp: [redacted]
  - James Landay

- Use this card

+ Add a new card

- Pay with PayPal

- $50.00 product minimum applies

Gift cards & Etsy Credit

- Redeem a gift card or Etsy Credit

© 2022 Etsy, Inc.

Merchant is Etsy, Inc. (USA) or Etsy Ireland UC (Ireland), depending on the currency in which the Seller transacts. See Etsy Payments Terms of Use.

If you donate to the Uplift Fund, your Merchant for the donation amount will be Brooklyn Community Fund. See Round Up Feature Terms and Conditions.
Double check your order details

Shipping address
James Landay
840 Tulane St.
STANFORD, CA 94305
United States

Payment method
Visa

Billing address
Same as shipping address

Order summary

Item(s) total $124.98
Shop discount -$74.99

Subtotal $49.99
Shipping $4.52
Sales tax $4.56

Order total (1 item) $59.07

Place your order to Stanford

I’d like to round up and donate $0.93 to the Uplift Fund

Choose a shipping method

Valentines Day Gift for Him, Wood Watch, Personalized Watch, Engraved Watch, Wooden

StayFineOfficial Ships from United States

Choose a shipping method

USPS First-Class Mail $4.52
Basic Web Design

• Let’s take a closer look page by page
Find things you'll love. Support independent sellers. Only on Etsy.

Popular gifts right now

Valentines Day Gift for Him, Personalized Wallet, Mens Gift, Anniversary Gift
★★★★★ (20,991)
$19.99 $49.99 (60% off)
FREE shipping

Vitamin Me Daily Dose of Love: Cute Gift for Him, Anniversary Gift
★★★★★ (3,883)
$22.49 $44.99 (10% off)
FREE shipping

Heart Keychain Set - Made with Authentic LEGO® Bricks, Gifts For Him
★★★★★ (4,216)
$8.38 $16.76 (50% off)
FREE shipping

Romanic Personalized Record - Birthday Gift for Her
★★★★★ (1,942)
$22.99 $45.99 (50% off)

Valentines Day Gift for Him, Wood Watch, Personalized Watch, Mens Gift
★★★★★ (11,338)
$49.99 $99.98 (50% off)
What site is this?
– Logo in top-left corner denotes the site
– examples of SITE BRANDING (E1)
What kind of site is this?

- Shopping cart icon
- Tab row categories/featured navigation
- UP-FRONT VALUE PROPOSITION (C2)
- example of PERSONAL E-COMMERCE (A1)
What can I do here?

- **Support sellers → buy**
- Tab row / Search on top
- Click on popular gifts
Find things you'll love. Support independent sellers. Only on Etsy.

• Most important info visible without scrolling
• ABOVE THE FOLD (I2)
Valentines Day Gift for Him, Wood Watch, Personalized Watch, Engraved Watch, Wooden Watch, Groomsmen Watch, Mens Watch, Boyfriend Gift, Gift for Dad

Stayfineofficial
38,158 sales
★★★★★

$49.99 $124.98
You save $74.99 (60%)

Would you like to engrave?
No Thanks!

Add your personalization
Example only:
Engrave: I love you to the moon and back!
"no engraving" if you choose "no engraving" option

You are my Analog!

Add to cart

Other people want this. Over 20 people have this in their carts right now.

Star Seller. This seller has a history of 5-star reviews, shipping on time, and replying quickly when they got any
What site am I at?

- Logo in upper-left reinforces brand, can click to go to home
- Same font, layout, color scheme also reinforces
- examples of SITE BRANDING (E1)
- price emphasizes I can buy
- i.e., PERSONAL E-COMMERCE (A1)
Where am I in the site?

- This is one place Etsy falls down
- Could have had
  - “Home > Watches” as LOCATION BREADCRUMBS (K6)
  - “Jewelry & Accessories” could be selected in TAB ROW (K3) & SEARCH ACTION MODULE (J1)
Where am I in the site?

- This is one place Etsy falls down
- Could have had
  - “Home > Watches” as LOCATION BREADCRUMBS (K6)
  - “Jewelry & Accessories” could be selected in TAB ROW (K3) & SEARCH ACTION MODULE (J1)
Can I trust this seller?

– Who am I buying from?
– Are they reputable?
  – aside: what do stars mean?
– Do people like the product?
– What about shipping cost?
The Fold – Hmm, what’s below here?
Watch, Mens Watch, Boyfriend Gift, Gift for Dad

$49.99+$64.99+
You save $14.99 (60%)

Would you like to engrave?
Select an option

Add your personalization
Example only:
Engrave: I love you to the moon and back!
"no engraving" if you choose "no engraving" option

Add to cart

11,338 reviews ★★★★★

Buyers are raving! Multiple people gave 5-star reviews to this shop in the past 7 days.

Reviews for this item 6,131 Reviews for this shop 11,338

Sort by: Recommended

Carly, Feb 27, 2022

★★★★★
Would you like to engrave?: Yes + Extra Links
Everything about this watch was even more beautiful in person!
Shipping was super fast and Paul even sent a message to make sure I was happy with my purchase!
Helpful?

Alvissa Strousser  Feb 22, 2022

⭐⭐⭐⭐⭐
Would you like to engrave?: Yes Please!
I ordered this for my boyfriend for Valentine's Day and I could not be happier! The quality was impeccable and the customer service was even better. I chose to get it engraved and after I submitted my order, I thought of something different to have engraved. The...  

Helpful?

Meghan Welter  Feb 23, 2022

⭐⭐⭐⭐⭐
Would you like to engrave?: Yes + Extra Links
I will definitely order from Paul again. And I highly recommend ordering from Paul! He was quick to respond when I had a moment of panic that I wrote the message I wanted engraved wrong, which I didn’t, and he understood exactly what I meant and needed. M...  

Helpful?

Emily Cromer  Feb 22, 2022

⭐⭐⭐⭐⭐
Would you like to engrave?: Yes Please!
This watch is beautiful! It looks even better in person! This is the first thing I've ordered through Etsy, and it couldn't have been a better outcome!

Helpful?

Description

- Complimentary adjustment tool for wood link.
- For very large wrist, if you need extra links, please select “+Extra links” option when you place the order, and we'll provide 4 extra links for you in the box.

ENGRAVED MESSAGE INSTRUCTIONS

Learn more about this item

Shipping and return policies

Estimated arrival
Mar 7-9

Cost to ship
$4.52

Returns & exchanges
Accepted

Exceptions may apply

Etsy offsets carbon emissions from shipping and packaging on this purchase.

Deliver to United States, 94305
Ships from Redding, CA

View shop policies
• What site am I at?
  – Logo in upper-left
  – Colors, layout, font
  – examples of SITE BRANDING (E1)
• Where am I in the site?
  – Last button clicked was “Add to cart!”
  – “in your cart” & “Proceed to Checkout” reinforce I’m on “the right page”
  – shopping cart icon changed
  – SHOPPING CART (F3)
• What am I going to buy?
  – Easy to remove & save for later
• How much will it cost?
  – Could be better as need to click for shipping costs – surprise!
• SHOPPING CART (F3)
What can I do (they want me to do)?

- “Proceed to Checkout”
- HIGH VISIBILITY ACTION BUTTON (K5)
  - visually distinct, looks clickable
  - large
• What if I don’t have a User ID?
• SIGN-IN/NEW ACCOUNT (H2)
• What if I’m using a new device?
  - 2-factor auth
• SIGN-IN/NEW ACCOUNT (H2)
• What if I forgot my password?
• SIGN-IN/NEW ACCOUNT (H2)
Choose a shipping address

- Default
  James Landay
  STANFORD, CA 94305
  United States

Add a new address
• What site?
  – Logo, layout, color, fonts

• Where in site?
  – Checkout, step 1 of 3
  – “Choose a shipping address”
  – QUICK-FLOW CHECKOUT (F1)
• Note what's different (?)
  – No tab rows
  – No impulse buys
  – Only navigation on page takes you to next step
• This is a PROCESS FUNNEL (H1)
  – Extraneous info & links removed to focus customers
Choose a payment method

You will not be charged until you review this order on the next page.

Default

Use this card

Add a new card

Pay with PayPal

$50.00 product minimum applies

Gift cards & Etsy Credit

 Redeem a gift card or Etsy Credit
• Last step of process
  – Step 3, “Review/Place Order”
  – “Place your order” button
• HIGH-VISIBILITY ACTION BUTTON (K5)
• No nasty surprises
  – Can see order
  – Total price is same as shopping cart
  – ORDER SUMMARY (F7)
• Easy to change shipping & billing
• All of these things are part of the design pattern – QUICK-FLOW CHECKOUT (F1)
Design = Solutions

• Design is about finding solutions
• Unfortunately, designers often reinvent
  • Hard to know *how* things were done before
  • *Why* things were done a certain way
  • *How* to reuse solutions
Design Patterns

Communicate common design problems & solutions

- First used in architecture [Alexander]
  
  • Ex. How to create a beer hall where people socialize?
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.
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, & rooms.”
  - Ex. Beer hall is part of a center for public life…
  - Ex. Beer hall needs spaces for groups to be alone…

ALCOVES
A Web of Design Patterns

(8) Mosaic of Subcultures

(31) Promenade
(33) Night Life
(90) Beer Hall
(95) Building Complex
(179) Alcoves
(181) The Fire

Cities & Towns
Local Gatherings
Interiors
Web Design Patterns

• Also used in UI design
• 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.

Group for User Interface Research

DENIM and SILK
- Download
- Documentation
- Support
- Research
- Publications
- More Projects

DENIM and SILK

IBM United States

- Home
- Products & services
- Support & downloads
- My account

More Projects

Buy today, ship today
NAVIGATION BAR (K2)
Solution diagram
- captures essence on how to solve problem

First-level navigation
Second-level navigation
Link to home
Pattern Groups

Our patterns organized by group

- Site genres
- Navigational framework
- Home page
- Content management
- Trust and credibility
- Basic ecommerce
- Advanced ecommerce
- Completing tasks
- Page layouts
- Search
- Page-level navigation
- Speed
- 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
Autumn 2023
dt+UX: Design Thinking for User Experience Design, Prototyping & Evaluation

• What’s different?
  – No tab rows
  – No impulse buys
  – Only navigation on page takes you to next step

• What’s the same?
  – Logo, layout, color, fonts
PROCESS FUNNEL (H1)

Problem: What if users need extra help?
FLOATING WINDOWS (H6)
FLOATING WINDOWS (H6)
FLOATING WINDOWS (H6)
PROCESS FUNNEL (H1)
Solution Diagram
PROCESS FUNNEL (H1)

Related Patterns

- (A1) E-Commerce
- (A10) Web Apps
- (A11) Intranets
- (K2) Navigation Bars
- (K3) Tab Rows
- (K4) Action Buttons
- (H8) Context-Sensitive Help
- (I2) Above the Fold
- (K5) High-Viz Action Buttons
- (K12) Preventing Errors
Patterns Support Creativity

• Patterns come from successful examples
  – sites that are so successful that lots of users are familiar with their paradigms (e.g., Google, Amazon, Yahoo, Facebook, Instagram…)
  – interaction techniques/metaphors that work well across many sites (e.g., shopping carts)
• Not too general & not too specific
  – you need to specialize to your needs
• Patterns let you focus on the hard, unique problems to your design situation
  – every real design will have many of these
Patterns Offer the Best of Principles, Guidelines & Templates

• Patterns help get details right, without over-constraining the solution
  – unlike principles, patterns not too general, so can see how to apply to your situation
  – unlike guidelines, patterns discuss tradeoffs, show good examples & tie to other patterns
  – unlike style guides, patterns not too specific, so can still be specialized
  – unlike page templates, patterns illustrate flows among different pages

• Patterns can serve as documentation for teams
• Often used along with or as part of design systems
Administrivia

- Project Questions?
- Project Fair Questions?
Grading on the Heuristic Eval Assignments

Assignment #7 Heuristic Evaluation (individual)
A7 HE (individual):  
-: 2% ✓ --: 4% ✓ -: 7% ✓ : 42% ✓ +: 45% ✓ ++: 1%
A7 HE (individual) Avg: 91%

Assignment #9 Heuristic Evaluation (group)
A9 HE (group):  
- : 0% ✓ --: 0% ✓ -:8% ✓ : 35% ✓ +: 58% ✓ ++: 0%
A9 HE (group) Avg: 93%
TEAM BREAK

WORK ON FINAL DELIVERABLES

1. PROTOTYPE
2. POSTERS
3. PITCH SLIDES
4. DEMO VIDEO
5. REPORT
A6 Highlights

Ambi

- Dynamic and scrollable!
- Lots of different media utilized to capture the ambience
- Intuitive UI - cleverly uses common UI patterns that adapt to their solution
- Pretty good use of whitespace.
Patterns in Exploration Phase

- Exploration-level patterns to design overall structure
  - different choices will give radically different designs
- For example, how to organize information
  - HIERARCHICAL ORGANIZATION (B3)
  - TASK-BASED ORGANIZATION (B4)
  - ALPHABETICAL ORGANIZATION (B5)
  - ...
Patterns in Exploration Phase

TASK-BASED ORGANIZATION (B4): Link the completion of one group of tasks to the beginning of the next related task(s)
Design Exploration Example

• John given the task of designing a new subsite for showing maps to businesses
  – listings found by typing in address
  – key feature: show nearby businesses

• John comes up with two design sketches
  – Design #1 uses ALPHABETICAL ORGANIZATION (B5) for list of all nearby businesses
  – Design #2 uses TASK-BASED ORGANIZATION (B4) for list of related nearby businesses
Design #1
ALPHABETICAL ORGANIZATION (B5)
Design #2
TASK-BASED ORGANIZATION (B4)

Boor Business Maps
Address:
1645 Solano Ave.
Berkeley, CA 94709

Map:

Related Businesses
- Restaurants
- Bars, Pubs, & Clubs
- Coffee Houses
- Theaters
- Book Stores
Evaluating Which Design to Choose

• Low-fidelity Usability Test
  – sketches the rest of the key screens on paper
  – brings in 5 participants to his office
  – asks each to carry out 3 tasks while colleague Sam “plays computer”
  – John observes how they perform

• Tasks
  – look up 1645 Solano Ave., Berkeley CA
  – look up 1700 California Ave, San Francisco CA & find Tadich Grill
  – look up 2307 Birch St., Palo Alto CA & find a Sushi restaurant nearby
Evaluating Which Design to Choose

• Results with Design #1 (Alphabetical)
  - Task 1: look up 1645 Solano Ave
    • no difficulties encountered – warm-up task!

  - Task 2: look up 1700 California & find Tadich Grill
    • several users didn’t notice that the list of nearby businesses was scrollable (due to paper affordances?)
    • those that scrolled took awhile to find in list of over 500

  - Task 3: look up 2307 Birch St. & find nearby Sushi restaurant
    • 3 users only picked restaurants that had “restaurant” in the name & thus couldn’t find “Daigo”
Evaluating Which Design to Choose

• Results with Design #2 (Task-based)
  - Task 1: look up 1645 Solano Ave
    • no difficulties encountered – warm-up task!

  - Task 2: look up 1700 California & find Tadich Grill
    • 1 user took awhile to figure out that Tadich Grill was a restaurant & to click on the “Restaurants” link
    • all others found it in 2 clicks (Restaurants->Tadich Grill)

  - Task 3: look up 2307 Birch St & find nearby Sushi restaurant
    • 3 found “Daigo” in 2 clicks
    • 2 others asked for a listing of Japanese restaurants
Evaluating Which Design to Choose

• General comments
  – 2 users said they often want to email/text maps to friends who they will be meeting (task-based)
  – 3 users wanted driving directions (task-based)

→ TASK-BASED ORGANIZATION (B4) worked better, but still had some minor problems
Design #2 – Revision 1
Adding More Related Tasks
Design #2 – Revision 2
Adding HIERARCHICAL ORGANIZATION (B3) & LOCATION BREADCRUMBS (K6)
Design #2 – Revision 3 Hi-Fi Prototype
Adding SEARCH ACTION MODULE (J1)
Anything wrong here?

Google recommends using Chrome

Easily search on Google with the fast, secure browser

Don't switch  Yes
Anything wrong here?

- Makes the default to switch to their browser overly easy
- https://twitter.com/mciarlo/status/1549367530032185345
Anything wrong here?

Please enter your details to reserve your item(s)

Title:  

First name *:  

Last name *:  

Email *:  

Phone number *:  

- Please do not send me details of products and offers from Currys.co.uk
- Please send me details of products and offers from third party organisations recommended by Currys.co.uk

Reserve items
Dark Patterns (AKA Deceptive Patterns)

- Trick questions
  - meaning of checkboxes alternates so 1st is “opt out” but 2nd is “opt in”
- Many other types of dark patterns
  - confirmshaming
  - bait & switch
  - hidden costs
  - friend spam...
- https://www.darkpatterns.org/
  or https://deceptive.design
Exit Ticket

Summary

• Lots of issues involved in designing compelling, usable interfaces (web or mobile)
• Design patterns are one way of capturing good design knowledge
  – generative (help you create new designs)
  – consider trade-offs
  – concrete examples of successful uses
  – a networked language that works together
Further Reading

Books on Web Design

• *The Design of Sites*. Doug Van Duyne, James Landay, Jason Hong. Addison-Wesley. 2nd edition. 2007. [at this point out of date]

• *Information Architecture for the Web and Beyond*. Louis Rosenfeld, Peter Morville, Jorge Arango. O'Reilly. 4th edition. 2015

• *Don’t Make Me Think!, Revisited*. Steven Krug. Que. 3rd edition. 2014.
Further Reading

Websites on Web Design

- digital.gov, for building accessible websites & more
- User Interface Engineering, at http://www.uie.com
- Mark Hurst’s creativegood.com
- Jakob Nielsen’s www.nngroup.com

What are your favorite web design blogs?
Next Time

- **Lecture**
  - Special career panel with 5 former CS147 CAs who are:
    - Product Designers, Product Managers, Software Engineers, & UX Researchers
  - lots of time for Team Work on Project

- **Studio**
  - A8 mid-way presentations & Team Work on Project

- **Next week (required attendance – this is your final exam!)**
  - Project Expo (70+ guests have RSVPd so far!)