Design Patterns

CSE 440
User Interface Design, Prototyping, & Evaluation
Autumn 2008

October 30, 2008

Hall of Fame or Hall of Shame?

- java.sun.com

Outline

- Review of Heuristic Evaluation
- Web Design Process, Specialties & Artifacts
- Detailed Design Example
- Web Design Patterns
- Ubicomp Design Patterns
- Mid-term Course Evaluation

Grade Stats

- #1 Project Proposal
  * High: 100, Low: 78, Mean: 87
- #2 Contextual Inquiry (Group)
  * High: 94, Low: 74, Mean: 84
- #3 ESM and Task Analysis
  * High: 92, Low: 71, Mean: 85
Review of Heuristic Evaluation

- Have evaluators go through the UI twice:
  - Phase 1 simply to get to know the overall UI
  - Phase 2 to carefully look for problems
- Ask them to see if it complies with heuristics
  - Note where it doesn’t & say why
- Combine the findings from 3 to 5 evaluators
  - Different evaluators will discover different problems
- Have evaluators independently rate severity
- Combine results in a group meeting
- Alternate HE with usability testing
- Different techniques will find different problems
- Tradeoffs:
  - HE inexpensive compared to usability testing
  - HE may find issues hard to find otherwise (e.g., a font that may slow down performance)
  - HE susceptible to finding false positives

Web Design Process

- Design Specialties
  - Information Architecture
    * Encompasses information & navigation design
  - User Interface Design
    * Also includes some testing & evaluation

Artifacts of Design Practice

- Designers create representations of sites at multiple levels of detail
- Web sites are iteratively refined at all levels of detail
- Site Maps
- Storyboards
- Schematics
- Mock-ups

Site Maps

- High-level, coarse-grained view of entire site
Schematics

- Page structure with respect to information & navigation

Mock-ups

- High-fidelity, precise representation of page
Basic Web Design

• Let's take a closer look page by page

What site is this?
- Logo in top-left corner denotes the site
- Another logo at top-right to reinforce
- examples of SITE BRANDING (E1)

What kind of site is this?
- Shopping cart icon
- Tab row content & categories on left
- Prices in content area
- UP-FRONT VALUE PROPOSITION (C2)
- example of PERSONAL E-COMMERCE (A1)
• What can I do here?
  – Welcome for new visitors
  – Tab row / Search on top
  – “Categories”
  – Prices
  – Examples of OBVIOUS LINKS (K10)

• Most important info visible without scrolling
  – ABOVE THE FOLD (I2)

• 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)

• Where am I in the site?
  – “Home > Music” are LOCATION BREAD CRUMBS (K6)
  – TAB ROW (K3) says “Music”
  – Album cover, “Product Highlights”, and CD cover

• Can I trust these sellers?
  – Who am I buying from?
  – Are they reputable?
  – What about shipping?
• The Fold
  – Hmm, what’s below here?

• Is this product any good?
  – Editorial reviews
  – Customer reviews
  – RECOMMENDATION COMMUNITY (G4)

• What site am I at?
  – Logo in upper-left
  – Colors, layout, font
  – examples of SITE BRANDING (E1)

• Where am I in the site?
  – Last link clicked was “Buy!”
  – “Shopping Cart” and “Proceed to Checkout” reinforce that this is “the right page”
  – SHOPPING CART (F3)

• Impulse buy
  • PERSONALIZED RECOMMENDATIONS (G3)
  • About this album
  • Lots of unused space
  • Still more info below...

• The Fold
  – Hmm, what’s below here?

• Impulse buy
  • PERSONALIZED RECOMMENDATIONS (G3)
  • About this album
  • Lots of unused space
  • Still more info below...

• The Fold
  – Hmm, what’s below here?

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Professor Landay
• Cross-selling
  – Possibly a pleasant surprise
  – Impulse buy
  – CROSS-SELLING & UPSELLING (G2)

• What am I going to buy?
  – Easy to remove
  – Easy to move to wishlist
  – How much will it cost?
  – Shipping costs there, no nasty surprises
  – SHOPPING CART (F3)

• What can I do?
  – “Proceed to Checkout” HIGH VISIBILITY ACTION BUTTON (K5)
    – Visually distinct
    – 3D, looks clickable
    – Repeated above and below the fold

• What if I don’t have a User ID?
• What if I forgot my password?
  – SIGN-IN/NEW ACCOUNT (H2)
• What site?
  – Logo, layout, color, fonts
• Where in site?
  – Checkout, step 1 of 3
  – “Choose 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 and links removed to focus customers

• Last step of process
  – Step 3, “Place Order”
  – “Place my order” button
• TWO HIGH-VISIBILITY ACTION BUTTONS (K5) for fold

• Easy to change shipping and billing
• Easy to save this info
  – Easier to setup info in context of specific task
  – Clear to customers why this info is needed

• No nasty surprises
  – Can see order
  – Total price is same as shopping cart
  – ORDER SUMMARY (F7)
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

- Design patterns communicate common design problems and solutions
  - First used in architecture [Alexander]
    - Ex. How to create a beer hall where people socialize?

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

- Now used in UI design
- Communicate design problems
  * 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.

**Solution diagram**
* Captures essence on how to solve problem

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

**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

- 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?
Patterns Support Creativity

- Patterns come from successful examples
  * sites that are so successful that lots of users are familiar with their paradigms (e.g., Yahoo)
  * 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 you get the details right, without over-constraining your solution
  * unlike principles, patterns not too general, so will 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 templates, patterns illustrate flows among different pages
- Patterns can serve as documentation for team-oriented environments

Format of Web Design Patterns

- Pattern Name and Number
- Exemplar
- Background
- Problem
- Forces
- Solution
- Solution Diagram
- Related Patterns

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Web Design Process

Patterns in Exploration Phase

- Use 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)
  * ...

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)
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 John's colleague Sam "plays computer"
  - John observes how they perform

- Tasks
  1) look up 1645 Solano Ave., Berkeley CA
  2) look up 1700 California Ave, San Francisco CA & find Tadich Grill
  3) look up 2106 N 55th St, Seattle WA & 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 2106 55th St & find nearby Sushi restaurant
    - 3 users only picked restaurants that had "restaurant" in the name & thus couldn't find "Kisaku"

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 2106 55th St & find nearby Sushi restaurant
    - 3 found "Kisaku" 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 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 BREAD CRUMBS (K6)
Design Patterns Moving Beyond Web

Summary

- Lots of issues involved in designing web sites
- Design patterns one way of capturing good design knowledge

Further Reading

Books on Web Design

Further Reading

Websites on Web Design

- UsableWeb.com, links to other usability sites
- Usability.gov, for building accessible websites
- Web pages that suck, at http://www.webpagesthatsuck.com/
- Net tips for designers, at http://www.dsiegel.com/tips/
- User Interface Engineering, at http://www.uie.com

New York Times Ecommerce Times, at

Webword.com usability log

CNet Builder.com, info on building sites

ACM's CHI-Web Mailing List
http://www.acm.org/sigchi/web/chi-web.html

Goodexperience.com web log

Jakob Nielsen useit.com

Next Time

- Lo-fi Prototyping
  * Read
  + Snyder, Paper Prototyping, Ch. 4
  + Discussion of guidelines for user observation
    By Kathleen Gomoll and Anne Nichols