CS 160: Lecture 15
Professor John Canny
Fall 2004

How can we Codify Design Knowledge?
- Now that you've worked on your project for > 6 weeks, you know a lot about how to solve the problem.
- How would you communicate your solution to another design team in a "portable" way?
- i.e. what specific elements should this description of your design have?
- Discuss this in a group and make a list!

Motivation for Design Patterns
- Most examples from UI literature are critiques
  * Norman, Nielsen, etc.
- Design is about finding solutions
- Unfortunately, designers often reinvent
  * hard to know how things were done before
  * hard to reuse specific solutions
- Design patterns are a solution
  * reuse existing knowledge of what works well

Design Patterns
- First used in architecture [Alexander]
- Communicate design problems & solutions
  * how big doors should be & where...
  * how to create a beer garden where people socialize...
  * how to use handles (remember Norman)...
- Not too general & not too specific
  * use solution "a million times over, without ever doing it the same way twice"

Example from Alexander: Night Life
Knit together shops, amusement, and services which are open at night, along with hotels, bars, and all-night diners to form centers of night life: well-lit, safe, and lively places that increase the intensity of pedestrian activity at night by drawing all the people who are out at night to the same few spots in the town. Encourage those evening centers to distribute themselves evenly across the town.
Design Patterns

Next used in software engineering
[Gamma, et. al.]
* communicate design problems & solutions
  + Proxy: surrogate for another object to control access to it
  + Observer: when one object changes state, its dependents are notified

We can do the same for Web Design
* communicate design problems & solutions
  + how can on-line shoppers keep track of purchases?
    ~ use the idea of shopping carts in physical stores
  + how do we communicate new links to customers?
    ~ Use consistent colors and mouseover highlights
* Leverage people's usage habits on/off-line
  * if Yahoo does things a way that works well, use it

Pattern Format

1. Pattern Title
2. Context
3. Forces
4. Problem Statement
5. Solution
   # Solution Sketch
6. Other Patterns to Consider

Example - Alcoves

1. Pattern Title: Alcoves
2. Context:
   Collaborative and common areas in buildings.
3. Forces
   Open spaces are inviting, but people want a sense of enclosure for private discussions.
4. Problem Statement
   Create a space that invites collaboration but also supports private discussion.
Pattern languages

- Alexander emphasized the importance of pattern languages—more than just collections of patterns.
- Languages are sets of patterns that fill out a design space, and are chosen to complement each other.
- Forces in each pattern may explain the relations with other patterns.

Patterns and idioms

- Not every design idea that uses the pattern syntax is a pattern.
- If an idea is too specific (e.g., programming language specific), then it is not a pattern.
- Specific ideas are called idioms.
- Similarly, patterns cannot be too general.
- It must be clear how the pattern should be applied in a context.

Home page design

1. Pattern Title: Home page
2. Context:
   - Pages that are the entry point for a web site.
3. Forces
   - People are attracted by novelty and good design, attention span is very short on the web, home pages are regularly updated.
4. Problem Statement
   - What to capture and hold visitors attention, encourage return visits, and be easy to maintain

Solution sketch

Example - Alcoves

5. Solution + sketch

Make small places at the edge of any common room, usually no more than 6 feet wide and 3 to 6 feet deep and possibly much smaller. These alcoves should be large enough for two people to sit, chat, or play and small enough to contain a desk or a table.
Home Page Design Rules

**Home Page Design Rules**

**Strong 1st impressions**
- compelling titles & logos
- simple navigation

Modularity simplifies updating

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**Home Page Design Rules**

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**Breadth on left**
- Highlights articles of general interest in center & right
- Links distinguished
- Subsections further down show more detail in particular areas

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**Home Page Design Rules**

**More Forces**
- without a compelling home page (H/P), no one will ever go on to the rest of your site
- surveys show millions of visitors leave after H/P
  - most will never come back -> lost sales, etc.

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**Six Ways to Make a Good Home Page**

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**Make a positive first impression by**
- testing
  + appropriate LINK NAMES & FAMILIAR LANGUAGE?
- looking at GUEST PROFILES (another pattern)
  + appropriate colors & graphics?
    - neon green & screaming graphics on a skateboarding site, but not on a business-to-business or health site

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**Six Ways to Make a Good Home Page**

**Focus on a single item of interest**
- create a good “first read”
  - draw the eye to a single graphical item
- make it clean & larger than rest on the page
- cut down remaining elements to chosen few

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Six Ways to Make a Good Home Page

1. Make navigation easy
   - Novices & experts must instantly "get it"
   - Use multiple ways to navigate
   - Basic features of site as embedded links
   - Navigations bars (there are several types)
   - HTML table colored backgrounds to delineate sections
   - Reusable accent graphics to highlight new things

2. Lure visitors to return
   - With fresh content
   - Keep it updated so there is a reason to come back
   - By seducing with text
   - You have only seconds
   - Lively, sparkling, precise

3. Make it download quickly (2-3 seconds)
   - If not, they'll go elsewhere
   - Strategies
     - Use HTML text as much as possible
     - First thing to download
     - Images take 10 server-browser comms
     - Get a web-savvy graphic artist (font colors, styles, & b/g color)

Pattern Examples

Personalizing Your Home Page

Problem
- Websites would like to have visitors return often
  - To buy, see ads, use services, etc.

Context
- E-commerce and portal sites (Amazon, Yahoo...)

Forces
- If your content isn’t changing & personal, users less likely to return or stay
Personalizing Your Home Page

Solution
* personalization
  + a home page that is customized for each visitor

How to Personalize Your Page

- Gather information from GUEST PROFILES & use it to build a site that
  - holds their interest
  - looks customized just for them
- Visitors will need to trust you
  - to give this information directly/indirectly
  - must use for their benefit only
- Four ways to collect information?
  - edit, interview, deduce, collaborative filtering

Editing Personalization Info

- Visitors click on buttons to make selections from lists
  - weather cities
  - news sources
  - stocks to follow
  - sports to follow...
- Include content modules based directly on selections
- Drawbacks to this approach?
  - can get tedious if you have to do it repeatedly
  - users won't spend time entering info if little benefit

my.yahoo.com is a good example of editing for personalization

Interviewing for Personalization Info

- Visitors answer multiple choice questions
- Update GUEST PROFILE
- Include CONTENT MODULES based on one or more scoring methods
- Allow the option of continuing the personalization process over time
Collaborative Filtering for Personalization Info

- First provide popular content modules based on all visitors
- Then provide customized content modules based on similar guest profiles
  - use patterns in profiles to determine areas of interest

E-commerce patterns

Shopping cart

- Problem:
  - how to allow customers to add items without disrupting their browsing, and purchase multiple items in one transaction
- Solution
  - use shopping cart metaphor to keep track of items before customer finalizes the purchase
  - track name, quantity, availability, & price

Shopping Cart

- Context:
  - Online stores
- Forces
  - People like to browse and add items (like the supermarket) while shopping.
  - People want to review purchases before paying.
  - Make it very easy to add items (defer commitment).

How to Apply Shopping Carts

- Provide detailed info on each item in cart
  - name w/ link to detail
  - quantity w/ way to change
  - availability
  - a way to remove item

- Provide info about all items in cart
  - sub-totals
  - shipping, taxes, other charges (if known)
How to Apply Shopping Carts

Provide a prominent link to CHECKOUT

Have a link to let people continue shopping

Don’t let unavailable things be added
* hard to find a good example of this

Don’t have customers type things twice

Checkout
* Details, quantity, availability, subtotal
* New customers
* Returning customers
* Address, shipping method, gift wrap, special instructions
* Method, billing address, gift certificate, coupons
* Confirm button, confirmation page, email, order tracking info, Thank you
Summary

- Motivation for patterns
- Design patterns in architecture & SE
- Web design patterns
- Home page patterns
- E-commerce patterns