CS 160: Lecture 15

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Outline

- Motivation
- Design patterns in architecture & SE
- Web design patterns
- Home page patterns
- E-commerce patterns
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!
How can we Codify Design Knowledge?

- Design Patterns!
- Patterns reflect
  - what designers create
  - what users do on the web across sites
- Web design patterns emerge from how we interact with the world around us
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”
Knit together shops, amusements, 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 these evening centers to distribute themselves evenly across the town.

clustered evening establishments
Example from Alexander: *Alcoves*

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 sometimes large enough to contain a desk or a table.
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
Design Patterns

What two software design patterns did we describe recently?

- Model-view controller
- Semaphores
Design Patterns

- 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 an space that invites collaboration but also supports private discussion.
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 sometimes large enough to contain a desk or a table.
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:
3. Forces
4. Problem Statement
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
Home Page Design Rules

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

Modularity simplifies updating
Home Page Design Rules

- Breadth on left
- Highlights articles of general interest in center & right
- Links distinguished
- Subsections further down show more detail in particular areas
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.
Six Ways to Make a Good Home Page

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
Six Ways to Make a Good Home Page

1. 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
Six Ways to Make a Good Home Page

1. Build your site brand
   * present the message of what your company does
   * include the value proposition (promise to visitors)
     + links to CONFIDENTIALITY INFORMATION & SITE ABUSE POLICIES to show you are trustworthy
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

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Six Ways to Make a Good Home Page

1. 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
Six Ways to Make a Good Home Page

- 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)

* use small graphics
* use min. number of columns & sections in a grid layout
  + easy to scan
Break
Pattern Examples

- Personalizing your home page
Personalizing Your Home Page

- **Problem**
  - web sites 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

Hello John Canny, we have Computers & Internet, Business & Investing, Science & Nature and other book recommendations for you. (If you're not James Landay, click here.)
for new users

diagram

for returning users
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 directory/indirectly
  * must use for their benefit only
- Four ways to collect information?
  * edit, interview, deduce, collaborative filtering
How to Personalize Your Page
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

- 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

Apocalypse Now (1979)
Marton Sheen plays the CIA killer who has to take out a crazy Marlon Brando in a bizarre, Vietnam-themed version of Conrad's Heart of Darkness

If you liked Apocalypse Now, you might enjoy:

- Platoon (1986)
  Tom Berenger's evil tries to trump Willem Dafoe's good in Oliver Stone's look at the dark side of the Vietnam War.

- The Deer Hunter (1979)
  A "big" movie about Vietnam and being a man and a buddy and about how you're supposed to kill deer and live and die and several other themes as well.

- Heart of Darkness (1994)
  Joseph Conrad's story has a company representative going upriver in colonial Africa to bring to heel a trader who's gone more native than the natives.
E-commerce patterns

- Shopping cart
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).
**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
How to Apply Shopping Carts

Provide detailed info on each item in cart:

- Name with link to detail
- Short description
- Quantity with a way to change
- Price
- Availability
- A way to remove item
- If you changed any quantities, please press this button to update.

Amazon.com Shopping Cart Example:
- Database Nation: The Death of Privacy in the 21st Century
  - Simson Garfinkel; Hardcover
  - Usually ships in 24 hours
  - List Price: $24.95
  - Our Price: $19.96
  - You Save: $4.99 (20%)
How to Apply Shopping Carts

1. 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
How to Apply Shopping Carts

Have a link to let people continue shopping

1. **Continue Shopping** on the Video home page
2. Proceed to checkout

If you changed any quantities, please press this button to update

Subtotal: $19.96
How to Apply Shopping Carts

Don’t let unavailable things be added
* hard to find a good example of this
Wish List for Jason Hong

Want to keep track of items you may want to purchase at a later date? Look for the "Save to Wish List" links on album pages, or move items here from your Shopping Cart.

Build your own CDNOW Gift Registry and show your friends and family exactly what you want! All they need to locate your Gift Registry is your email address or the special URL we will provide when you add the first item to your registry.

Wish List Items

Add checked items to cart

- Midori Encore!
  Added Oct. 02, 2000
  CD Add to Cart $14.99

- Midori Live At Carnegie Hall
  Added Oct. 02, 2000
  CD Add to Cart $14.99

Delete
Show on my gift registry
Checkout

- **Shopping Cart =>**
  - Details, quantity, availability, subtotal

- **Sign-in =>**
  - New customers
  - Returning customers

- **Shipping =>**
  - Address, shipping method, gift wrap?, special instructions

- **Payment =>**
  - Method, billing address, gift certificate, coupons

- **Confirmation**
  - Confirm button, confirmation page, email, order tracking into, Thank you
Checkout

1. Make it easy to cancel or change order at any time before final confirmation

2. Don’t have customers type things twice
Summary

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