Perception, Memory and Problem Solving

Set 6: Human Computer Interaction
(and some SSI to help)

How People Think

• Key factors:
  – Perception
  – Attention
  – Learning
  – Memory
Mental Models

- Involves unconscious and conscious processes, where images and analogies are activated based on a particular view

- Deep vs. shallow models

- Lesson? Match UI to expected paradigm
  - Example:

Memory: A golden rule?

- How many items in a list can people remember?

- Miller, 1956: The Magical Number …. 

- Lesson: If you don’t exceed this number…
  - Content more likely to be remembered
  - Faster recall

- Corollary: Don’t expect users to remember many shortcuts etc.
Exception #1

• How many do you know?
  – Phone numbers?
  – Names?
  – Passwords?

• What’s the key difference?

Exception #2

• Do I have to remember everything?
  – People can scan lists of bullets, tabs, menu items till they see the one they want
  – They don’t have to recall them from memory having only briefly heard or seen them

• Lesson:
  – Make pages easy to scan
  – Group similar things together visually
  – Make wise use of screen real estate
How People Act (part 1)

- Alternative strategies:
  - Goal Based
  - First Available
  - First Reasonable
  - First Attention

How People Act (part 2)

- Attention Focuses
  - Color
  - Sound
  - Moving/Flashing items
  - Boundaries

- Learned Procedures
Perceived Affordance

- Book: Don Norman “The Design of Everyday Things”
- Affordance – a “quality of an object, or an environment, that allows an individual to perform an action”
  - Do users realize they can act?
  - Do they feel like they (their group) are included by the site / activity?
  - Lesson: need to know your audience
- “Perceived affordance”
  - Norman argues that what really matters is that users perceive the site to be actionable, and reasonably inclusive of them – regardless of whether it was actually designed for them

Providing Perceived Affordances

- Consider your audience – but don’t include content that will drive non-typical users away
- Follow conventional usage
  - Both images and allowable interactions
- Use words to describe desired actions
- Use a metaphor that users understand
- Use same model throughout
  - Consistent ease of training, ease of use
Feedback

• Newton’s Third Law of Motion
  – “For every action there is an equal and opposite reaction”
• What is most frustrating about trying to perform some action?

• Lesson:
  • Obvious principle – but doesn’t always happen?

Providing Feedback

• Design in feedback from the beginning
  • Change color / shape / size
  • Popup Dialog boxes
  • Add sound
  • Plan for user mistakes…warn them
  • Allow users to see results, confirm action was taken
Other things users need

• Consistency
• Navigation

• How to provide without HTML duplication?
  – Frames
  – SSI

SSI Example
**SSI Example Part 1**

```html
<div style="float:left; margin-right: 2em; margin-bottom: 99in">

<p>
  <a href = "link.shtml">
    <img src = "buttons/links.jpg" width = "65" height = "50" alt = "Links Page" />
  </a><br />
  
  <a href = "list.shtml">
    <img src = "buttons/list.jpg" width = "65" height = "50" alt = "List Example Page" />
  </a><br />
  
  <a href = "contact.shtml">
    <img src = "buttons/contact.jpg" width = "65" height = "50" alt = "Contact Page" />
  </a><br />

  ...
</p>
</div>
```

**SSI Example Part 2**

```xml
<?xml version = "1.0" encoding="utf-8" ?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
  "http://www.w3.org/TR/xhtml11//DTD/xhtml11.dtd">
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head>
    <title>Internet and WWW How to Program - Main</title>
  </head>
  <body>
    
    <!-- #include file="navssi.html" -->
    
    <h1>Welcome to Our Web Site!</h1>
    <p>We have designed this site to teach about the wonders of <strong><em>XHTML</em></strong>. <em>XHTML</em> is better equipped than <em>HTML</em> to represent complex data on the Internet. <em>XHTML</em> takes advantage of XML's strict syntax to ensure well-formedness. Soon you will know about many of the great new features of <em>XHTML</em>.
    </p>
  </body>
</html>
```
Other SSI commands
(depending on web server)

<!--#include file="inc.txt"--><br />
<!--#lastmod file="inc.txt"--><br />
<!--#filesize file="test1.stm"--><br />
<!--#echo var="DOCUMENT_URI"--><br />
<!--#config timefmt="%m/%d/%y %H:%M:%S"--><br />
<!--#echo var="DATE_LOCAL"--><br />
<!--#config sizefmt="bytes"-->
<!--#filesize file="inc.txt"--><br />
<!--#exec cgi="/scripts/testcgi.exe"--><br />

See http://www.4images.com/ntperl/isiall.htm