



Perception, Memory and Problem Solving

IT350 Fall 2008

Set 5: 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



main.shtml

SSI Example Part 1

```
<?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>
```

navssi.html

SSI Example Part 2

```
<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>
```

Other SSI commands (depends on web server)

```
<!--#include file="inc.txt"--><br />  
<!--#flastmod file="inc.txt"--><br />  
<!--#fsize 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"-->  
<!--#fsize file="inc.txt"--><br />  
<!--#exec cgi="/scripts/testcgi.exe" --><br />
```

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