Interface Hall of Fame or Shame?

**Good**
- Discoverable gestures
- Keeping things simple means gestures don’t cause unexpected problems
- Logical hierarchy of items
- Sounds & animations are pleasurable & beautiful → app is FUN

**Bad**
- Does not have features of major competitors (cloud, sync, multidevice)

Clear iOS App
By Realmac Software

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Options
- Editor
- Tabs
- Debug
- Compatibility
- Directories
- Workspace
- Font

- Tabbed dialog for setting options in MS Web Studio
- more tabs than space to display them
- Clicking on the right arrow once gives:

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- Inconsistent display of possible tabs
- Where did the "Editor" tab go?
- Position of arrows awkward (split to each side?)
- also, small targets near each other (Fitts’ Law)

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Interface Hall of Fame or Shame?

Conceptual Models & Interface Metaphors

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University of Washington
Autumn 2012

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Interface Hall of Shame!

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Human Abilities Review

- Color can be helpful, but pay attention to
  - how colors combine
  - limitations of human perception
  - people with color deficiency
- Model Human Processor:
  - perceptual, motor, cognitive processors + memory
  - model allows us to make predictions
    - e.g., perceive distinct events in same cycle as one
- Memory:
  - three types: sensor, WM, & LTM
  - interference can make hard to access LTM
  - cues in WM can make it easier to access LTM
- Key time to remember: 100 ms

Design of Everyday Things

- By Don Norman (UCSD, Apple, HP, NN Group, NU)
- Design of everyday objects illustrates problems faced by designers of systems
- Explains conceptual models
  - doors, washing machines, digital watches, telephones, ...
- Resulting design guides
  ➔ Highly recommended

Conceptual Models

- Mental representation of how an artifact works & how interface controls affect it
- People may have preconceived models that are hard to change
  - (4 + 5) vs. (4 5 +)
  - dragging to trash?
    - deletes file but ejects disk
- Interface must communicate model
  - visually (& possibly physically or using sound)
  - online help and documentation can help, but shouldn’t be necessary

Affordances as Perceptual Clues

- Well-designed objects have affordances
  - clues to their operation
  - often visual, but not always (e.g., speech)
Affordances as Perceptual Clues

- Poorly-designed objects
  - no clues or misleading clues

French artist Jacques Carelman
Crazy design for a screw punch!

Refrigerator

Problem: freezer too cold, but fresh food just right

Refrigerator Controls

Normal Settings: C and 5
Colder Fresh Food: C and 6-7
Coldest Fresh Food: B and 8-9
Colder Freezer: D and 7-8
Warmer Fresh Food: C and 4-1
OFF (both): 0

What is your conceptual model?

A Common Conceptual Model

A       B       C       D       E
7 6 5 4 3

Design Model:
Customer Model:
System Image:

- Can you fix the problem?
- Possible solutions
  - make controls map to customer’s model
  - make controls map to actual system

- Customers get model from experience & usage
  - through system image
- What if the two models don’t match?
Conceptual Model Mismatch

- Mismatch between designer’s & customer’s conceptual models leads to...
  - slow performance
  - errors
  - frustration
  - ...

Notorious Example

Design Guides

- Provide good conceptual model
  - customer wants to understand how UI controls impact object
- Make things visible
  - if object has function, interface should show it
- Map interface controls to customer’s model
  - infix vs. postfix calculator – whose model is that?
- Provide feedback
  - what you see is what you get! (WYSIWYG)

Make Things Visible

- Refrigerator
  - make the A..E dial something about percentage of cooling between the two compartments?
- Controls available on watch w/ 3 buttons?
  - too many and they are not visible!
- Compare to controls on simple car radio
  - #controls = #functions
  - controls are labeled (?) and grouped together

Map Interface Controls to Customer’s Model

- Which is better for car dashboard speaker front / back control?
- Control should mirror real-world
Map Interface Controls to Customer’s Model

Map Interface Controls to Customer’s Model

Metaphor

- Definition: “The transference of the relation between one set of objects to another set for the purpose of brief explanation.”
- Lakoff & Johnson, Metaphors We Live By
  - “...the way we think, what we experience, and what we do every day is very much a matter of metaphor.”
  - in our language & thinking – “argument is war”
    ... he attacked every weak point
    ... criticisms right on target
    ... if you use that strategy
- We can use metaphor in interface design to leverage existing conceptual models

Desktop Metaphor

Suggests a conceptual model
- not really an attempt to simulate a real desktop
- a way to explain why some windows seemed blocked
- leverages existing knowledge about files, folders, & trash

Example Metaphors

- Global metaphors
  - personal assistant, wallet, clothing, pens, cards, telephone, eyeglasses
- Data & function
  - rolodex, to-do list, calendar, applications documents, find, assist
- Collections
  - drawers, files, books, newspapers, photo albums

How to Use Metaphor

- Develop interface metaphor tied to conceptual model
- Communicate that metaphor to the user
- Provide high-level task-oriented operations, not low-level implementation commands
Summary

- Conceptual models:
  - mental representation of how the object works & how interface controls effect it

- Design model should equal customer’s model:
  - mismatches lead to errors
  - use customer’s likely conceptual model to design

- Design guides:
  - make things visible
  - map interface controls to customer’s model
  - provide feedback

Further Reading

- Design of Everyday Things, Donald Norman
- Design as Practiced, Donald Norman
  - Talks about failure to make changes to Macintosh
- Computing the Case Against User Interface Consistency, Jonathan Grudin
  - Talks about why interfaces should not always be consistent
  - [http://www1.ics.uci.edu/~grudin/Papers/CACM89/CACM89.html](http://www1.ics.uci.edu/~grudin/Papers/CACM89/CACM89.html)

Next Time

- Gestalt Principles (in class activity)
- Readings:
  - Gestalt Principles from Universal Principles of Design
- Next Tuesday:
  - Watch videos in class & critique