



Conceptual Models

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- ▶ CS, Stanford, Introduction to Human Computer Interaction Design
- ▶ CS, UC Berkeley, User Interface Design, Prototyping, and Evaluation
- ▶ National Chiao Tung Univ, Taiwan By: I-Chen Lin, Assistant Professor

- ▶ Conceptualize interaction design before trying to build anything.
- ▶ Understand the need for a clear conceptual model in interface design
- ▶ Be able to analyze and create appropriate models for specific applications.
- ▶ Understand the use of metaphors in designing interfaces
- ▶ Be able to choose them appropriately

- ▶ In interacting with any system (software or others), a person has a concept of what the system is:
 - ▶ what its components are,
 - ▶ what properties they have, and
 - ▶ what interactions they can enter into...
- ▶ This conceptual model is the basis for the more specific aspects of interface, such as screen representations and command structures.



Conceptual Models based on Activities (Instructing)



1. Instructing

- ▶ E.g. Commands in DOS or Unix.
- ▶ E.g. Control keys, menu options in windows.
- ▶ Benefits: quick and efficient for repetitive actions.
- ▶ Have to avoid remembering a large set of command names.

Conceptual Models based on Activities (Conversing)

2. Conversing

- ▶ E.g. help facilities, search engines, etc.
- ▶ E.g. Voice or natural language based system
- ▶ Benefits:
 - ▶ friendly for novices
- ▶ Drawbacks:
 - ▶ Misunderstanding (for NLP)
 - ▶ Repetition and inefficiency (e.g. phone-based systems)
 - ▶ Too much expectation (e.g. intelligent or animated agents.)



Conceptual Models based on Activities (Manipulation)

3. Manipulation and navigation

- ▶ Exploiting users' knowledge of how they do this in the physical world.
- ▶ Properties
 - ▶ Continuous representation of objects and actions.
 - ▶ Immediate feedback.
 - ▶ Physical actions instead of issuing commands.



The benddesk,
<http://hci.rwth-aachen.de/benddesk>

Conceptual Models based on Activities (Manipulation)

3. Manipulation and navigation

► Benefits:

- Learning basic functions rapidly
- Easily remembering how to use
- Usually no error messages
- Immediate responses
- Users feel in control

► Drawbacks:

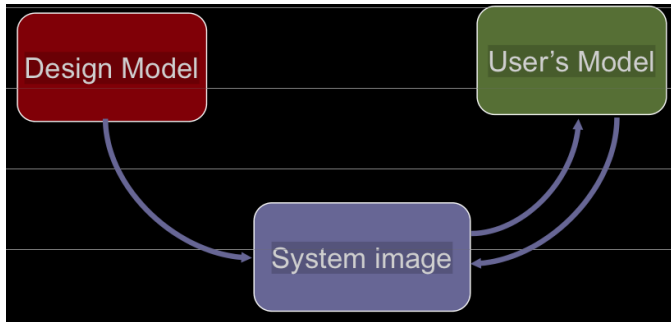
- Expecting reactions like the physical ones.



4. Exploring and browsing (based on activities)

- ▶ E.g. CD-ROMs, webpages, etc.
- ▶ Conceptual Models based on objects
 - ▶ Focusing on a particular objects.
 - ▶ E.g. spreadsheet (Excel)

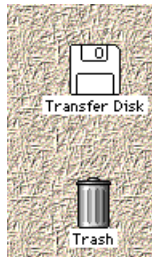
- ▶ Mental representation of how object works & how interface controls affect it
- ▶ People have preconceived models that you may not be able to change
 - ▶ dragging to trash ?
 - ▶ deletes (eject disk a bad idea!)
 - ▶ Visual Clues (affordances)



Customers get model from experience & usage through system image

- ▶ Provide good conceptual model
 - ▶ customers want 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?
- ▶ Provide feedback
 - ▶ what you see is what you get!

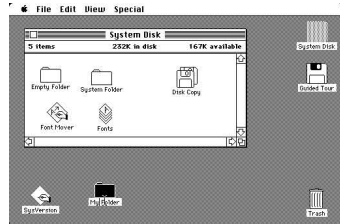
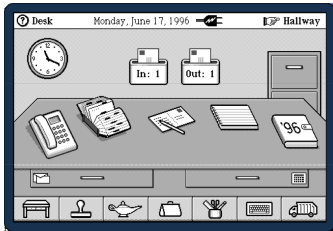
- ▶ A metaphor implies many elements of the model to a user who is familiar with the metaphorical object (e.g., a physical desktop)
- ▶ In general a model requires more learning without metaphors to which users can anchor it to their previous experience.



Example Metaphors



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Southwest Airlines Home Gate

The Home of Southwest Airlines on the World Wide Web

see <http://hallofshame.gp.co.at>

► Direct translations

- Software CD player that requires turning volume knob with the mouse
- Software telephony solution that requires the user to dial a number by clicking on a simulated keypad
- Airline web site that simulates a ticket counter!

