CS 66-460
Introduction to Graphical Human Machine Interfaces

The Use of Metaphor in the User Interface

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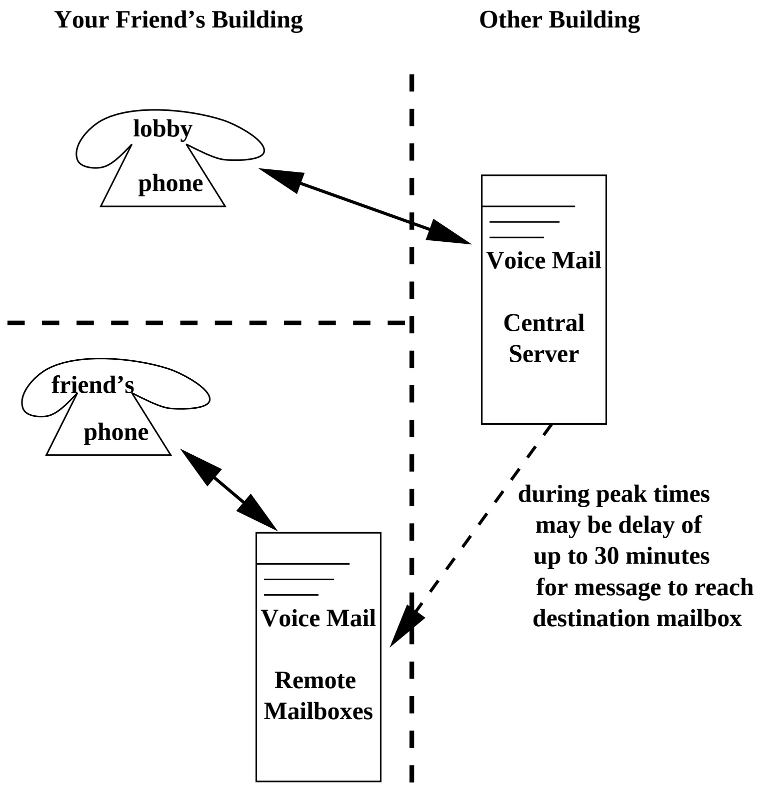
The Actual Model for the Voice Mail System



- Inappropriate metaphor:
  mailbox, post office, answering machine
- (More) appropriate metaphors
  answering service

What is Metaphor?

Metaphor is an integral part of our language and thought.

We encounter metaphor:

- in novels, literature and poetry, to provide a more colorful image to readers
- in everyday speech and common everyday tasks

Metaphor is ubiquitous

- mostly we don't notice we are using it
- a word that is used in a metaphorical way often introduces a whole trail of other words and associations (i.e., think of all the things you think of when you hear *desktop metaphor*)

  Metaphors function as natural models, allowing us to take our knowledge of familiar, concrete objects and experiences and use it to give structure to more abstract concepts.

Purpose of Metaphor in User Interfaces

- Recall that users form **mental models** of the devices and software systems they use
- The purpose of the model is to help the user understand how the system works making it easier for the user to determine:
  - what the system can do
  - when the system functionality is available
  - how quickly the system can perform
- A **metaphor** — when used appropriately — can help the user conceive and understand the model better.

Using Metaphor in the User Interface

- Generate metaphors to use in the interface.
  1. Develop a conceptual model of the system.
  2. Identify users problems.
  3. Find an appropriate metaphor.
- Evaluate the metaphors for their usability in the interface.
  1. Amount of structure.
  2. Applicability of structure.
  3. Representability of the metaphor.
  4. Suitability of the metaphor.
  5. Extensibility of the metaphor.
- Integrate the metaphor into the user interface.

Generating Metaphors

1. **Develop a conceptual model of the system.**

   The purpose of using a metaphor in the user interface is to help the user have a better understanding of the system, its functionality, and its operation. The metaphor helps the user form an accurate mental model.

   A model helps the user (and the designer!) understand how the system works making it easier for the user to determine:

   - what the system can do
   - when the system functionality is available
   - how quickly the system can perform

   The first step is to build a model of the system.

Generating Metaphors

2. **Identify user's problems**

   There is no one metaphor that can model all aspects of the system functionality. Therefore, identify which parts or features of the system are most likely to cause the user difficulty.

   The best way to do this is to **observe your users**. If you are designing a new system, you can use user interface prototypes – these can be paper mock-ups or actual UI prototype software – and then observe your users using the system through the prototype.

   For an existing system, you may already be familiar with the parts of the system which give the user the most trouble due to feedback already obtained. But, should you modify the model in any way, you should still observe your users using the new model.

Generating Metaphors

3. **Find an appropriate metaphor.**

   Once the model has been developed, find an appropriate metaphor.

   Remember that your **end users** may not be as technical as you, the designer. Therefore, be careful about choosing metaphors that are familiar to you, but not your users.

   Choose a metaphor that is appropriate for your end users.

   Example metaphors:

   - Apple Macintosh OS GUI: *desktop metaphor*
   - HyperCard: *stack of note cards* or *a book*
   - spreadsheet: *business ledger sheet*

Evaluating Metaphors

Once you have come up with several metaphors, you may wish to determine how appropriate each of them are. Here are some characteristics that can be used to evaluate a metaphor.

1. **Amount of structure.**

   How much structure does the metaphor provide?

   By structure we mean concepts and ideas with in the metaphor domain that can be used to help explain the model.

   For example, the newspaper metaphor contains all kinds of concepts: editions, delivery routes, subscribers, delivery people, editors, etc.

   Similarly, the TV broadcast metaphor also has a lot of structure: channels, cable provider, VCR, shows, stations, reruns, premiere, etc.

2. **Applicability of structure.**

   How much of the metaphor is relevant to the problem?

   Will the metaphor mislead the user into getting a false understanding of the model or how the system works?

3. **Representability of the metaphor.**

   Is the metaphor easy to represent in the user interface?

   Does the metaphor have distinctive visual or auditory elements or representations that can be used when you implement the user interface?

Evaluating Metaphors

4. **Suitability of the metaphor.**

   Will your users understand the metaphor? Are they familiar with it?

   Note that you may have a metaphor that satisfies all of the other criteria above, but if the metaphor is not suitable it will be **useless** to your users.

   How do you determine if the metaphor is suitable? **Observe your users!**

5. **Extensibility of the metaphor.**

   What else does the metaphor buy you?

   Does the metaphor have useful bits of structure that may be useful later on?

   Does the metaphor extend itself?

Integrate Chosen Metaphor into the User Interface

- Once you have chosen a metaphor you must integrate it into the user interface of the system.
- Look for visual or auditory concepts from the metaphor that can be readily implemented into the underlying user interface.
- Be sure to explain the metaphor in your documentation, online help, etc.