Design of Everyday Things

Overview

- Why are some everyday things difficult to understand and use?
- What are Don Norman's principles and how do they apply to the design of everyday things?
- How can we apply Norman's principles to the design of computer interfaces?

Everyday Things

- We are surrounded by many every day things that have poor usability
  - Programming a VCR
  - Telephone features we can’t remember how to use
  - Photocopiers and fax machines
- Many o f these things can be difficult to interpret and frustrating to use if they provide no clues or false clues as to how they operate

Why is usability important?

- Poor usability results in
  - anger and frustration
  - decreased productivity in the workplace
  - higher error rates
  - physical and emotional injury
  - equipment damage
  - loss of customer loyalty

What is usability?

- Usability is a measure of the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment.

Examples of Poor Design

- Handles afford pulling
- Using a flat plate would constrain the user to push

Norman's Principles of Design

- Make things visible
- Provide a good conceptual model
  - Affordance
  - Mapping
  - Constraints
  - Feedback

Visibility

- The correct parts must be visible and they must convey the correct message
- Natural signals are naturally interpreted
- Visibility problems occur when clues are lacking or exist in excess
- Just by looking the user should know
  - State of the system
  - Possible actions
- Don’t violate these principles to make something “look good”!

How fast are we going?

Good Conceptual Model

- A good conceptual model allows us to predict the effects of our actions
- **Without a good model we operate blindly**
  - Simply follow rules without understanding a reason
  - No understanding of cause or effect
  - No recourse when something breaks

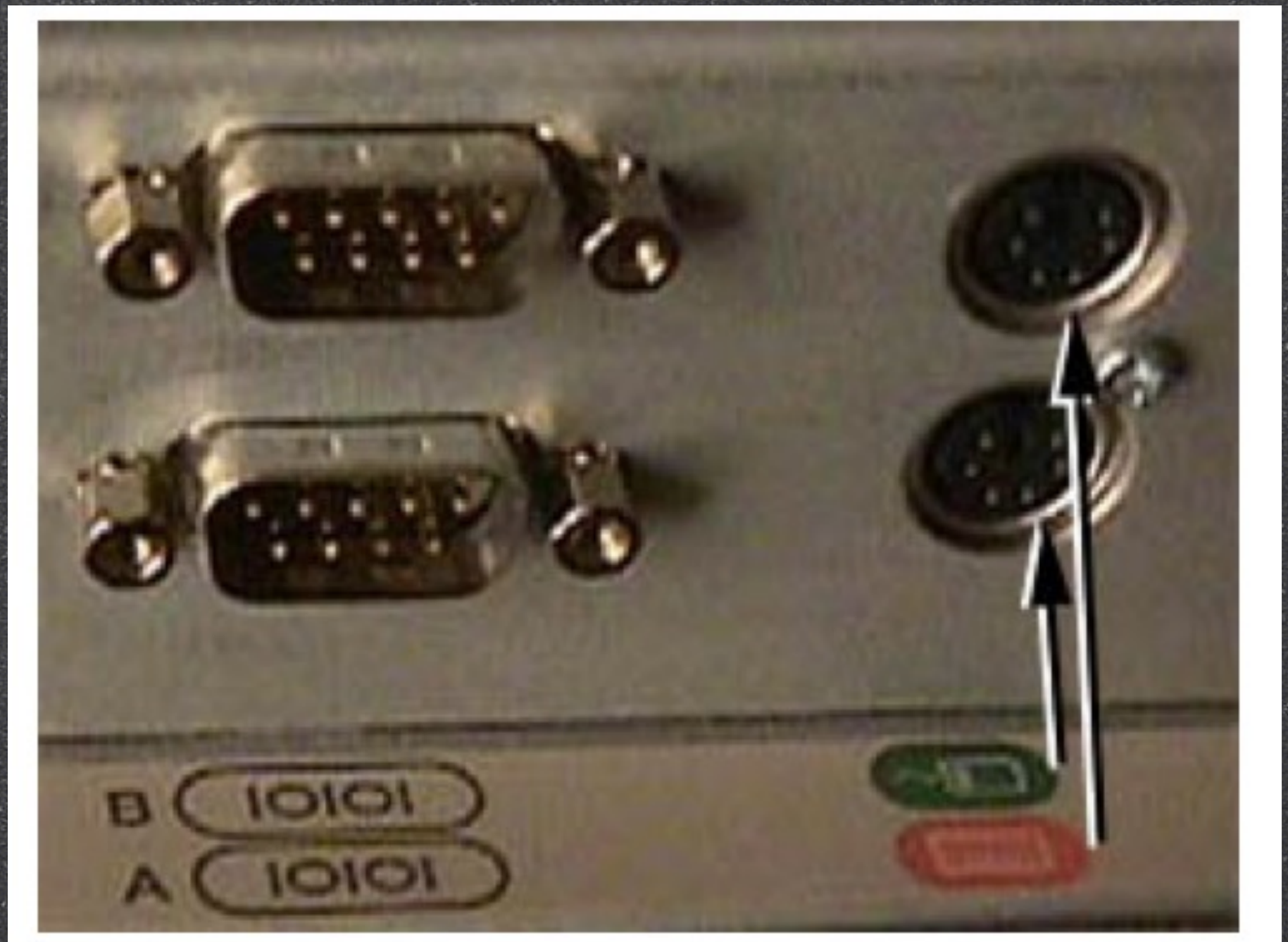
Affordances

- The affordances of an object determine,naturally, how it can be used
  - Button affords pushing
  - Handle affords grasping
  - Chair affords sitting
  - Knob affords turning
- Just by looking at the object, a user should know how to use it

Mapping

- Controls and displays should exploit natural mapping
- Natural mapping takes advantage of physical analogies and cultural standards
  - Physical: Steering wheel
  - Cultural: red means stop,green means go

Mouse or Keyboard?



What Knob Goes Where?

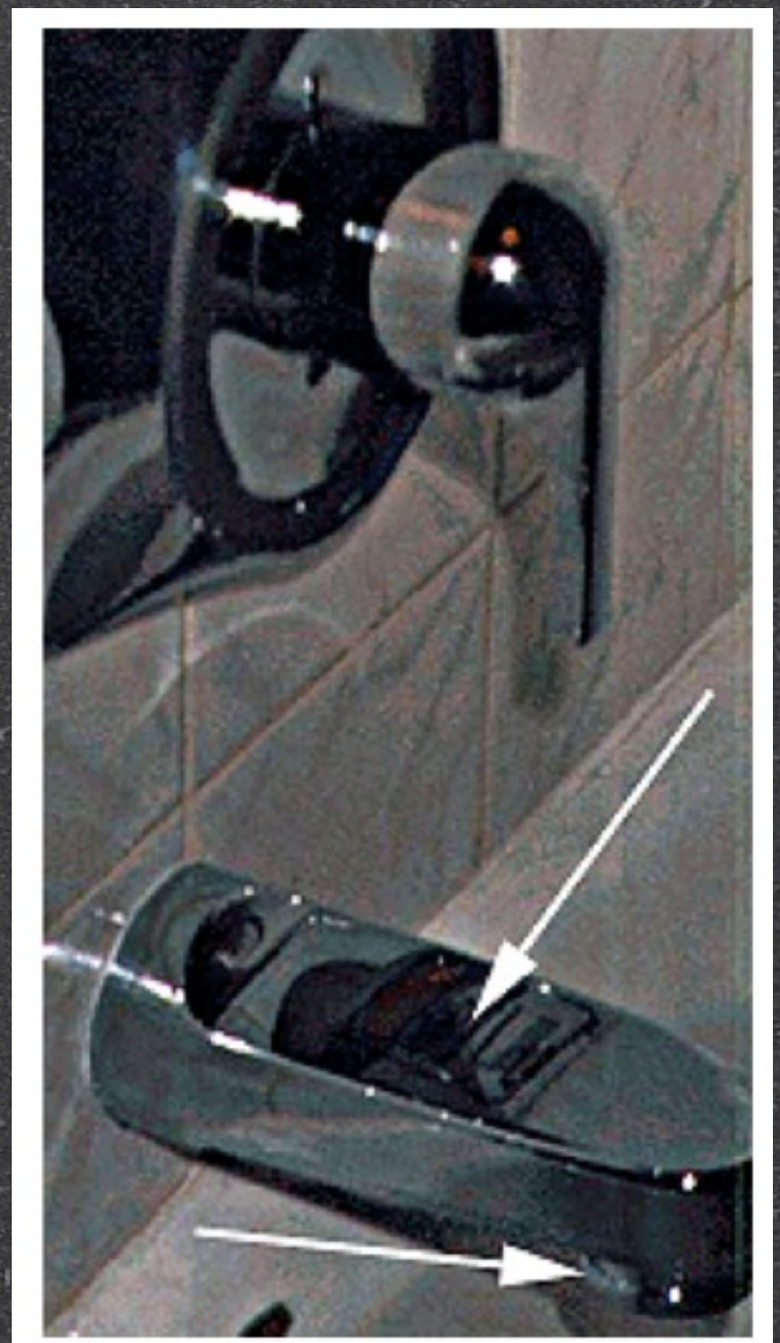
Exploiting Natural Mapping

How do you play the CD?

How do you turn on the shower?

- Must reach down where the water comes out and pull down!

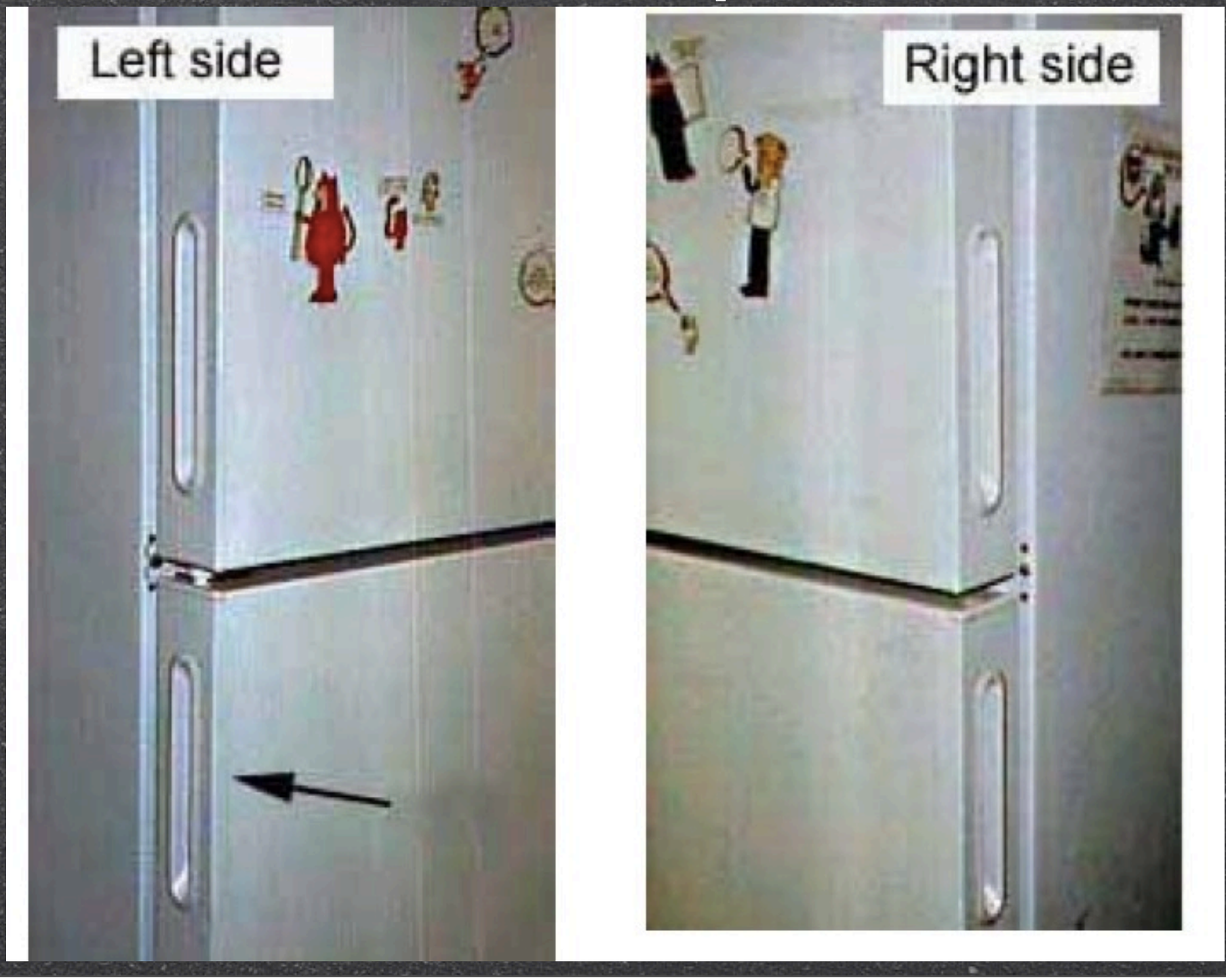
- Need instructions !



Constraints

- Constraints limit the ways in which something can be used
- Constraints can be
  - Physical
  - Semantic
  - Cultural
  - Logical

On which side does the door open?



Feedback

- Feedback is sending back to the user information about what action has actually been done
- Visibility of the effects of the operation tell you if something worked correctly
- Systems should be designed to provide adequate feedback to the users to ensure they know what to do next in their tasks

Feedback Examples

- Telephone button press tones
  - click sounds
- Rice cooker goes “bing!”
- Clicker on your turn signal
- Animated icon while waiting for a web page to load

Norman's Principles in Software

- Visibility
  - Visibility of the tasks the interface supports
  - Communication of system state / mode
- Affordance
  - If it looks like a button it can be pressed, if it is a underlined it can be clicked (web)
- Mapping
  - Clicking on a particular interface element produces expected effect (under F)ile should be O)pen)

Summary

- Usability problems are common
- If there are usability problems in everyday “simple” things, the challenge is 100-fold for complex software
- Usability problems can be overcome through attention to design and addressing studies from HCI

Norman's Principles in Software

- Constraints
  - Constraining search criteria, graying out menu items that don't apply in a particular context
- Feedback
  - Providing clear and immediate feedback for each user action

Visibility

- Visibility problems occur when clues are lacking or exist in excess
- Larson's dog effect:

Visibility

- Thank you for registering! We appreciate your business. To activate your software, you will be sent an email key. After you have received the key then you will be able to <u>click here</u> and you can then proceed with the activation process.
- Blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah <u>click here</u> blah blah blah blah blah blah blah blah blah blah blah