Design of Everyday Things
--Don Norman

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Agenda

- Discuss Norman's views on HCI & design

Summary

'Darn these hooves! I hit the wrong switch again!
Who designs these instrument panels, raccoons?'

Don Norman

- Currently with Nielsen Norman group &
  professor at Northwestern

- Previously Professor at UCSD, at Apple,
  HP, etc.

Discussion

- What did you take away from DOET book?

Daily Challenges

- How many of you can use all the functionality in your
  - VCR
  - Digital watch
  - Copy machine
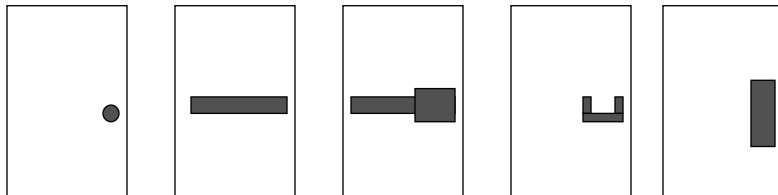 - Stereo system
  - Plumbing fixtures

Fun Examples

- Leitz slide projector
  - To move forward, short press
  - To move backward, long press

- What happens when you get frustrated?

Fun Examples
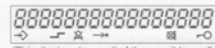
Doors

One in this room!

Fun Examples

Phones

How do you
- transfer a call
- change volume
- store a number
- ...

Location of Controls

Headset Jack (p. 28)

TONE Button (p. 24)

One-Touch Auto Dial Buttons (p. 20)

Display (p. 5)

MIC (Microphone) (p. 13)

VOLUME ☑, ☐ Buttons (p. 14, 29)

MUTE Button (p. 18, 22, 24)

SP-PHONE (Speakerphone)/HEADSET Button and Indicator (p. 13, 15, 29)

LOWER Button (p. 21, 23)

AUTO Button (p. 16)

PROGRAM Button (p. 9, 16, 20)

REDIAL/PAUSE Button (p. 14, 25)

FLASH Button (p. 24)

Display

00000000000000000

(This display shows all of the possible configurations.)

0 15-30	During a conversation, the call duration is displayed. (Example: 15 minutes, 30 seconds)
→	The unit is in the programming mode (p. 9, 16, 20).
→•	The AUTO button was pressed while dialing or storing phone numbers for the Speed Dialer (p. 16, 19).
⌐	The LOWER button was pressed (p. 21, 23).
🕱	The ringer is set to OFF (p. 10).
⊠	The MUTE button was pressed during a conversation (p. 24).
⊸O	The dial lock mode is set. To cancel the mode, see page 27.
F	The FLASH button was pressed while storing phone numbers.
P	The PAUSE button was pressed while dialing or storing phone numbers.
ч	You pressed ✱ while dialing or storing phone numbers in the TONE mode.
ᵌ	You pressed # while dialing or storing phone numbers in the TONE mode.
□	While storing a phone number in an UPPER memory location for the One-Touch Dialer, "□" will appear when you press a one-touch auto dial button (p. 20).
□	While storing a phone number in a LOWER memory location for the One-Touch Dialer, "□" will appear when you press a one-touch auto dial button (p. 21).
⌐-⌐	The MUTE button was pressed as a secret button while storing phone numbers (p. 18, 22).
∪	While programming function items, such as the dialing mode, "∪" will flash as a cursor.

Preparation

5

Changing Ringer Volume

- Press "Program"

- Press "6"

- Set volume
  - Low - Press "1"
  - Medium - Press "2"
  - High - Press "3"

- Press "Program"

Important Concepts

- Affordances

- Visibility

- Conceptual models

- Mapping

- Feedback

- Constraints

Affordance

- What is it?

Visual Affordances

- Perceived and actual fundamental properties of an object that determine how it could be used
  - Chair is for sitting
  - Ball is for throwing
  - Button is for pushing

Yikes!

Mantra

- Complex things may need explanation, but simple things should not
    - If a simple thing requires instructions and pictures, it is likely a failed design

Designing for People

- Norman's 2 main principles
  - Provide a good conceptual model
  - Make things visible

Conceptual Model

- What does Norman mean by that?

Conceptual Models

- People build their own systems of how things work
  - Example - car

- Designer can help user foster an appropriate conceptual model
  - Appearance, instructions, behavior...

Visibility

- When functionality is hidden, problems in use occur
  - Occurs when number of functions is greater than number of controls

- When capabilities are visible, it does not require memory of how to use
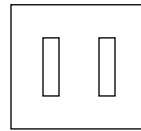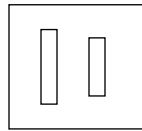 - Remind person how to use something

Simple Example

Electric plugs
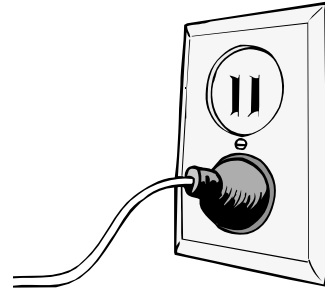
What if both sides were "big" and you had to remember which side the "small" one went into?

Simple Example

- Bathroom faucets
  - Two functions
    - Hot/cold
    - Pressure

Bathroom Faucets 1

Can you figure out how to use it?

Are two functions clear and independent?

Bathroom Faucets 2

Can you figure out how to use it?

Are two functions clear and independent?

Bathroom Faucets 3

Can you figure out how to use it?

Are two functions clear and independent?

Two Important Principles

- Mapping
- Feedback

Mapping

- What does this mean?

Mapping

- Relationship between two objects, here, between control and action/result
  - Good:
    - Car, various driving controls
    - Mercedes Benz seat adjustment example
  - Bad
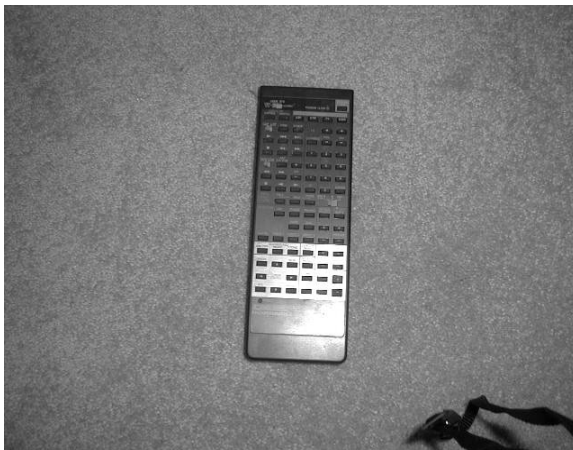   - Car stereo - Knob for front/back speakers

Stove

Which controls which?

Yikes!
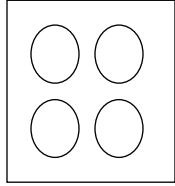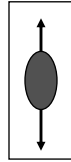
Why Not Design Better

- Stove

- Speakers

Physical, monetary, convenience, etc., constraints dictate otherwise

Feedback

- Let someone know what just occurred
  - Can be sound that's made
  - Can be change in physical state

Constraints

- Limitations on what can be done
  - Physical - keys
  - Semantic - menu graying
  - Cultural - Colors
  - Logical - When all above don't apply

Individual Differences

- Whom do you design for?
  - Everyone? Impossible
  - Average? Excluding half audience
  - 95%? Still may miss a lot

- Can't accommodate everyone

Individual Differences

- Designers are not representative of the user population for whom they are designing

- Don't expect users to think or act like you

- People vary in both physical attributes and mental/cognitive attributes
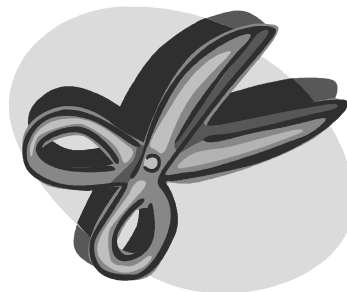

Example

Affordances - Insert something into holes

Constraints - Bigger hole for several fingers, small for thumb

Mapping - How to insert fingers into holes suggested by visible appearance

Conceptual model - Suggested by how parts fit together and move

Scissors

Why Design is Hard

- Number of things to control has increased dramatically

- Displays are more virtual/artificial

- Marketplace pressure
  - Adding operations cheaper (computers)
  - Adding controls expensive (real estate, cost)

- Errors are becoming increasingly serious

Try and Try Again

- Norman thinks that it often takes 5 or 6 tries to get something "right"

- Simply may not have that luxury in a competitive business environment

Upcoming

- Design (general)

- Prototyping