Design of Everyday Things

Don Norman
Discuss Norman’s views on HCI & design
“Darn these hooves! I hit the wrong switch again! Who designs these instrument panels, raccoons?”
Currently with Nielsen Norman group

Previously Professor at UCSD, at Apple, HP, etc.
What did you take away from DOET book?
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
Fun Examples

Phones

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

- Headset Jack (p. 28)
- One-Touch Auto Dial Buttons (p. 20)
- Display (p. 5)
- TONE Button (p. 24)
- MIC (Microphone) (p. 13)
- VOLUME Buttons (p. 14, 29)
- MUTE Button (p. 18, 22, 24)
- LOWER Button (p. 21, 23)
- AUTO Button (p. 16)
- PROGRAM Button (p. 9, 16, 20)
- REDIAL/PAUSE Button (p. 14, 25)
- SP-PHONE (Speakerphone)/HEADSET Button and Indicator (p. 13, 15, 29)
- FLASH Button (p. 24)

Display

- This display shows all of the possible configurations.
- 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).
- The dial lock mode is set. To cancel the mode, see page 27.
- The FLASH button was pressed while storing phone numbers.
- The PAUSE button was pressed while dialing or storing phone numbers.
- You pressed the TONE mode.
- You pressed 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, "U" will flash as a cursor.
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?
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?
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
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
    - Stoves
Mapping Examples

Money:
Euros vs. US Dollars
Size::value
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

- For whom do you design?
  - 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
Leonid Stadnyk uses a cellphone at his home in Ukraine. He finds the keys difficult to work.
Example

Scissors

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

Users - Often for right handed users only
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

- User Centered Design
- IRB