Design of Everyday Things
--Don Norman

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Agenda

- Discuss Norman’s views on HCI & design
Summary

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?

Doors

One in this room!
Fun Examples

Phones

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

Location of Controls

Display

(This display shows all of the possible configurations.)

During a conversation, the call duration is displayed. (Example: 18 minutes, 30 seconds)

- The unit is in the programming mode (p. 8, 16, 30).
- The AUTO button was pressed while dialing or storing phone numbers for the Speed Dialer (p. 8, 16, 30).
- The LOWER button was pressed (p. 21, 23).
- The ringer is set to OFF (p. 16).
- The MUTE button was pressed during a conversation (p. 34).
- 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 while dialing or storing phone numbers in the TONE mode.
- You pressed while dialing or storing phone numbers in the TONE mode.
- While storing a phone number in an EEPROM memory location for the One-Touch Dialer: * will appear when you press a one-touch auto-dial button (p. 25).
- While storing a phone number in a DRAM memory location for the One-Touch Dialer: * * will appear when you press a one-touch auto-dial button (p. 31).
- The MUTE button was pressed as a silent button while storing phone numbers (p. 19, 22).
- While programming functions items, such as the dialing mode, * will be shown 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
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
  ![Diagram of a stove with four burners](image)
  Physical, monetary, convenience, etc., constraints dictate otherwise

- Speakers
  ![Diagram of a speaker](image)

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
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