

# Design of Everyday Things --Don Norman

John Stasko

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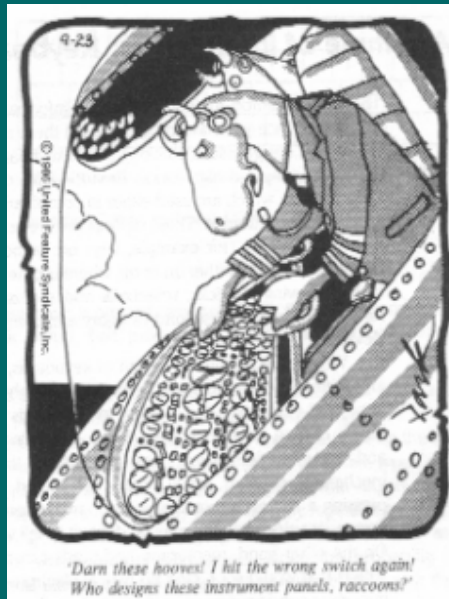
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## Agenda

- Discuss Norman's views on HCI & design



## Summary



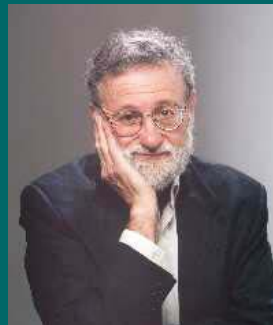
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## Don Norman

- Currently with Nielsen Norman group & professor at Northwestern
- Previously Professor at UCSD, at Apple, HP, etc.



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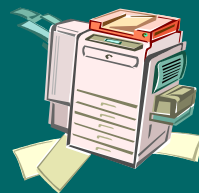
## Discussion

- 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



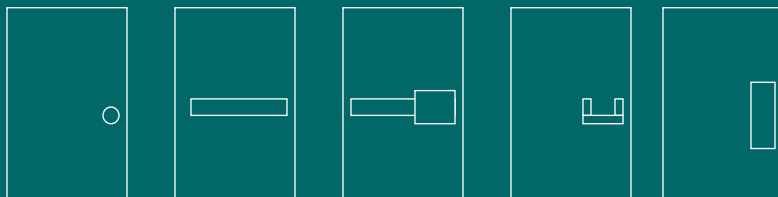
## Fun Examples

- 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!



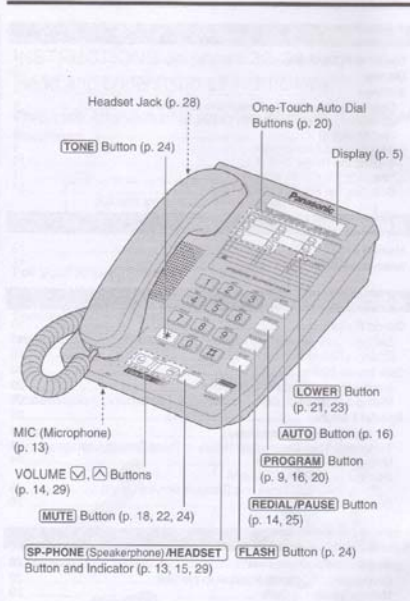
# Fun Examples

## Phones

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



### Location of Controls



### Display



(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).
- ⊖ 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 UPPER memory location for the One-Touch Dialer, "O" 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, "o" 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.

Preparation



## 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...



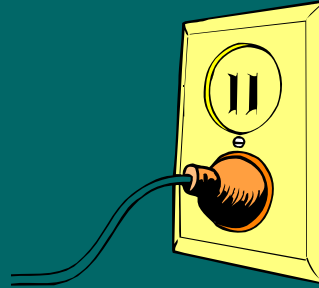
## Visibility

- 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

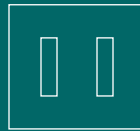
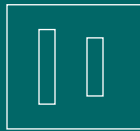


## Simple Example

### 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?

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## Yikes!



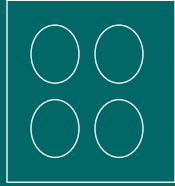
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## Why Not Design Better

- 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

