Lesson 7

Interaction Design (CM3055)

Ben Shneiderman

8 Golden Rules of Interface Design

Shneiderman's Eight Golden Rules

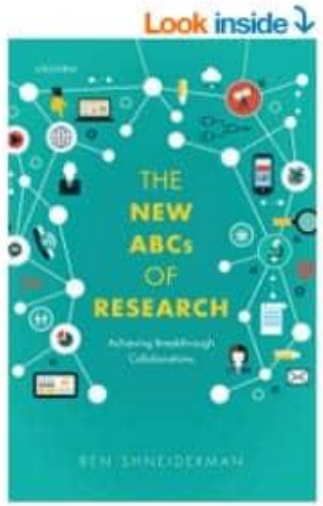
1. **Consistency** (terms, icons, data / command flow)
2. **Universal Usability** (novices → intermittent users → experts)
3. **Informative feedback**
4. **Dialogs with closure** (beginning → end)
5. **Prevent errors** (highlight required actions, selection rather than freestyle typing, automatic completion, well-defined messages)
6. **Reversal of actions** (undo)
7. **User in control** (automated adaptability can cause confusion)
8. **Reduce short term memory** (keep displays simple)

Further Reading:
https://www.interaction-design.org/literature/article/shneiderman-s-eight-golden-rules-will-help-you-design-better-interfaces

Golden Rule 1: Consistency

Strive for consistency in the way the system looks and works

- **Terminology**
  - identical words/terms for prompts, menus and help screens
- **Aesthetics**
  - Consistent colour codes, layout, fonts, etc. across windows
- **Symbols**
  - Consistent use of icons, symbols, graphics
- **Response**
  - The system must respond to input in the same way every time



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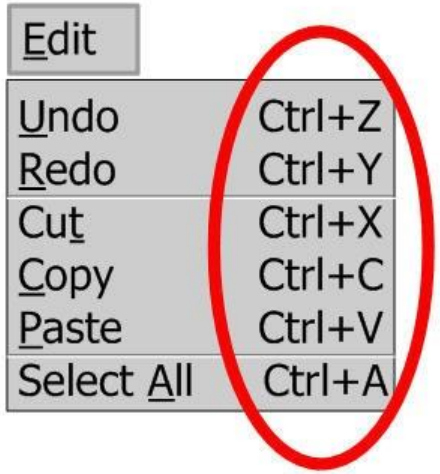
Golden Rule 2: Universal Usability

- Allow frequent users to develop a clear idea of how the system works, and let them work faster

- Sometimes this takes the form of shortcuts, toolbars, and hotkeys



Golden Rule 3: Informative Feedback

- For every user action, there should be some feedback from the system
  - Frequent and minor actions - response can be modest
  - Major actions - response should be more substantial

Golden Rule 4: Dialogues with Closure

- Design interactions to have a beginning, middle and end
- For every user action, there should be some feedback from the system

Golden Rule 5: Error Prevention

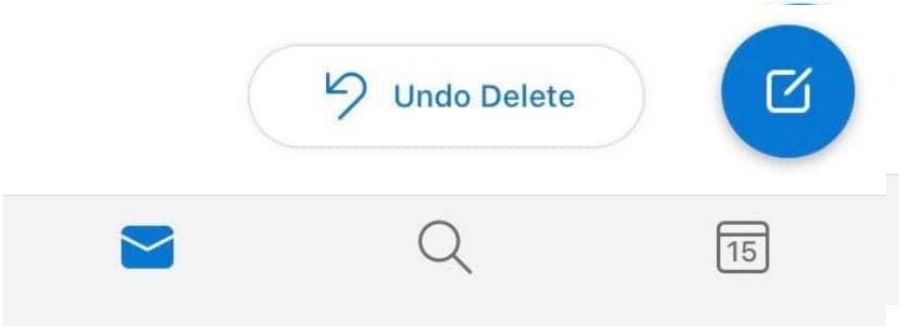
- Try to design the system such that the users cannot make a serious error
- If they do make an error
  - the system must be able to detect it
  - and offer easy-to-understand instructions for recovery

Golden Rule 6: Reversal of Actions

- No matter how many times you warn people, they will always manage to do something catastrophic

- The famous Undo command!
  - relieves anxiety

- The units of reversibility
  - may be a single action, a data entry, or a complete group of actions
  - can be done with logs - history viewers, or recovering the last thing



Golden Rule 7: Support Control

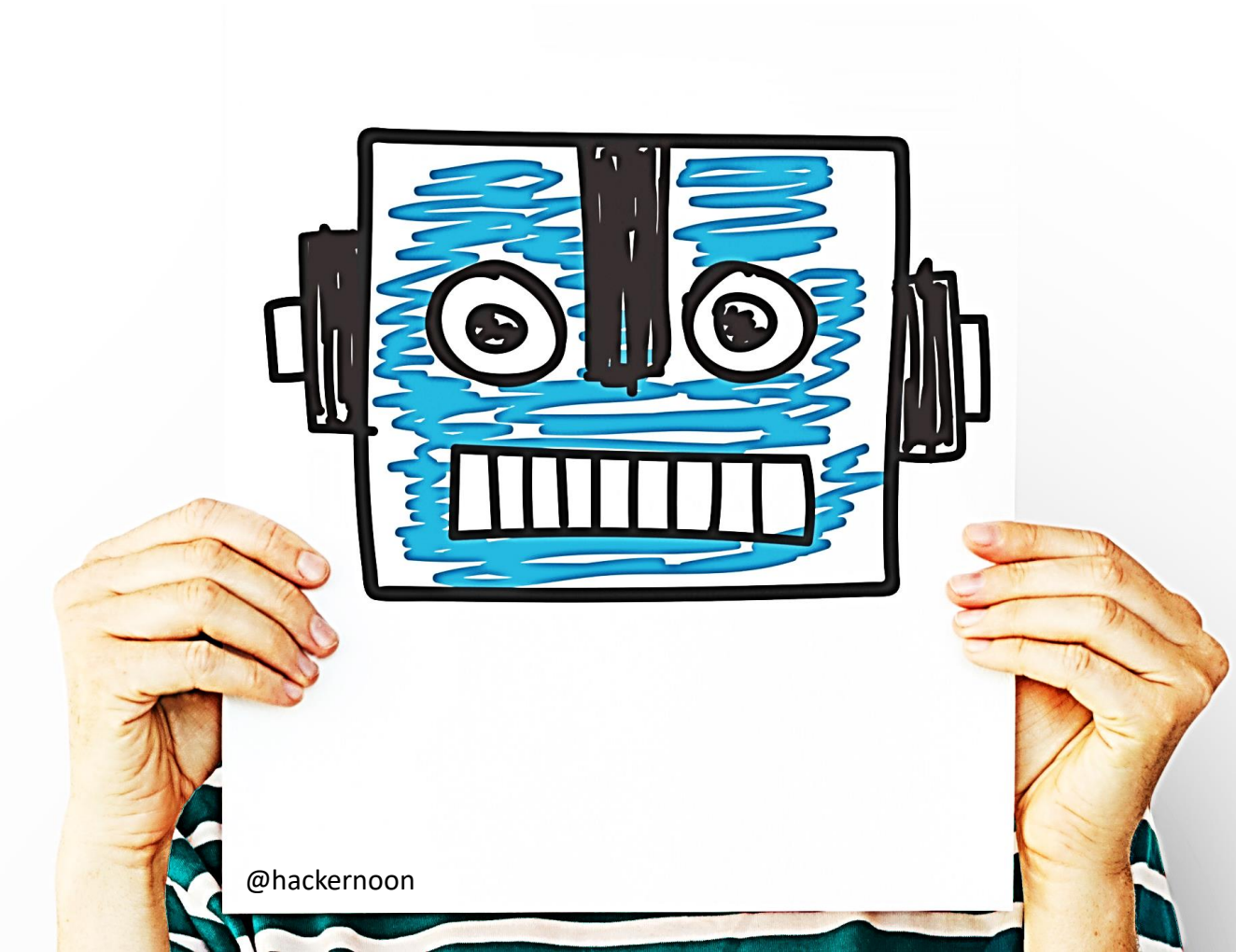
- Let the user feel in control of the system at all times
  - This concept originates from the 1980s, when users went from **responding** to a computer to **initiating** actions

- The user should have control at every point in the execution of an application

- Example:
  - ability to delete a print job
  - stop an attempt to connect to a Web site
  - call up the Windows Task Manager > ctrl + alt + del

Balancing Automation & Human Control

- Tedious/routine tasks
  - Give it to a robot
- Decision making/creative
  - Give it to a human



Balancing Automation & Human Control

Humans better at:

- Sense low level stimuli
- Detect stimuli in noise
- Recognize constant patterns in varying situations
- Sense unusual and unexpected events
- Remember principles and strategies
- Retrieve pertinent details a priori
- Draw on experience and adapt decisions
- Select alternatives
- Reason inductively; generalize from observations
- Act in emergency or novel situations
- Apply principles
- Make subjective evaluations
- Concentrate on important tasks when overload occurs
- Adapt physical response

Machines better at:

- Sense stimuli outside human range
- Count or measure physical quantities
- Store quantities of coded information accurately
- Monitor specified (and infrequent) events
- Make rapid and consistent responses to input signals
- Recall quantities of detailed information accurately
- Process quantitative data
- Reason deductively; infer from principles
- Perform repetitive pre-programmed actions reliably
- Exert high forces
- Perform simultaneous activities
- Maintain operation under heavy load
- Maintain performance over extended periods of time

Golden Rule 8: Reduce Memory Load

- Average human can remember seven chunks of information, and too much information is confusing

- This requires that:
  - displays are kept simple
  - complexity is reduced
  - sequences of actions to carry out a task are short
  - commonly used operations are visible on the first screen

Good User Interfaces Are…

- **Easy to learn**
  - Minimal training required
- **Easy to remember**
  - High transfer of learning
- **Predictable**
- **Few Errors**
- **Easy to recover from errors**
  - Aiding explorative learning
- **Efficient**
  - Users perform tasks quicker
- **Engaging**