

Designing with the Mind in Mind

A Simple Guide to
Understanding
User Interface
Design Rules

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Well-known User Interface Design Rules

Here is a sampling of user interface design guidelines that have been published.

NORMAN (1983A)

Inferences from research

- Mode errors suggest the need for better feedback
- Description errors suggest the need for better system configuration
- Lack of consistency leads to errors
- Capture errors imply the need to avoid overlapping command sequences
- Activation issues suggest the importance of memory reminders
- People will make errors, so make the system insensitive to them

Lessons

- **Feedback:** The state of the system should be clearly available to the user, ideally in a form that is unambiguous and that makes the set of options readily available so as to avoid mode errors.
- **Similarity of response sequences:** Different classes of actions should have quite dissimilar command sequences (or menu patterns) so as to avoid capture and description errors.
- **Actions should be reversible:** As much as possible and where both irreversible and of relatively high consequence, they should be difficult to do, thereby preventing unintentional performance.
- **Consistency of the system:** The system should be consistent in its structure and design of command so as to minimize memory problems in retrieving the operations.

SHNEIDERMAN (1987); SHNEIDERMAN AND PLAISANT (2009)

- Strive for consistency
- Cater to universal usability
- Offer informative feedback
- Design task flows to yield closure
- Prevent errors
- Permit easy reversal of actions
- Make users feel they are in control
- Minimize short-term memory load

NIELSEN AND MOLICH (1990)

- Consistency and standards
- Visibility of system status
- Match between system and real world
- User control and freedom
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Provide online documentation and help

STONE *et al.* (2005)

- **Visibility:** First step to goal should be clear
- **Affordance:** Control suggests how to use it
- **Feedback:** Should be clear what happened or is happening
- **Simplicity:** As simple as possible and task-focused
- **Structure:** Content organized sensibly
- **Consistency:** Similarity for predictability
- **Tolerance:** Prevent errors, help recovery
- **Accessibility:** Usable by all intended users, despite handicap, access device, or environmental conditions

JOHNSON (2007)

Principle 1 Focus on the users and their tasks, not on the technology

- Understand the users
- Understand the tasks
- Consider the context in which the software will function

Principle 2 Consider function first, presentation later

- Develop a conceptual model

Principle 3 Conform to the users' view of the task

- Strive for naturalness
- Use users' vocabulary, not your own
- Keep program internals inside the program
- Find the correct point on the power/complexity tradeoff

Principle 4 Design for the common case

- Make common results easy to achieve
- Two types of "common": "how many users" vs. "how often"
- Design for core cases; don't sweat "edge" cases

Principle 5 Don't complicate the users' task

- Don't give users extra problems
- Don't make users reason by elimination

Principle 6 Facilitate learning

- Think "outside-in," not "inside-out"
- Consistency, consistency, consistency
- Provide a low-risk environment

Principle 7 Deliver information, not just data

- Design displays carefully; get professional help
- The screen belongs to the user
- Preserve display inertia

Principle 8 Design for responsiveness

- Acknowledge user actions instantly
- Let users know when software is busy and when it isn't
- Free users to do other things while waiting
- Animate movement smoothly and clearly
- Allow users to abort lengthy operations they don't want
- Allow users to estimate how much time operations will take
- Try to let users set their own work pace

Principle 9 Try it out on users; then fix it

- Test results can surprise even experienced designers
- Schedule time to correct problems found by tests
- Testing has two goals: informational and social
- There are tests for every time and purpose