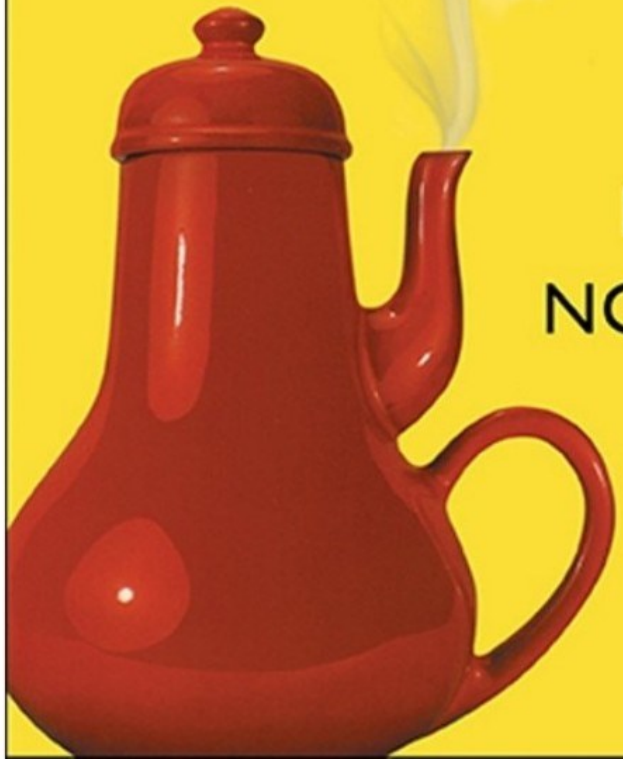
Usability Goals, Principles, Guidelines

REVISED & EXPANDED EDITION

The DESIGN *of* EVERYDAY THINGS



DON NORMAN

Visibility

- This is a control panel for an elevator.
- How does it work?
- Push a button for the floor you want?

- Nothing happens. Push any other button? Still nothing. What do you need to do?

It is not visible as to what to do!

Visibility

…you need to insert your room card in the slot by the buttons to get the elevator to work!

How would you make this action more visible?

- make the card reader more obvious
- provide an auditory message, that says what to do (which language?)
- provide a big label next to the card reader that flashes when someone enters
- make relevant parts visible
- make what has to be done obvious

Reminder….

- users should be involved through the development of the project
- specific usability and user experience goals need to be identified, clearly documented and agreed at the beginning of the project
- iteration is needed through the core activities

Usability Goals

- Here's one set
  - Effective to use
  - Efficient to use
  - Safe to use
  - Have good utility
  - Easy to learn
  - Easy to remember how to use

Usability Goals

- Effective to use (*effectiveness*)
  - A general goal: how well does a system do what it should do?
- Efficient to use (*efficiency*)
  - Do things quickly, easily.
  - Especially common tasks.
- Safe to use (*safety*)
  - Protect people from hazards (usually not a SW issue)
  - Help prevent user from making errors and recover from errors
  - Give users confidence

Usability Goals (2)

- Have good *utility*
  - Has the right kind of functionality
  - Supports users in accomplishing tasks
- Easy to learn (*learnability*)
  - Includes how easy it is to learn advanced features.
- Easy to remember how to use (*memorability*)
  - Many systems used infrequently

How to Measure Usability?

- We want to achieve these goals, but how do we know?
- Develop measurable criteria based on previous goals. Examples:
  - Time to learn
  - Speed of performance
  - Rate of errors over by users
  - Retention over time
  - Subjective satisfaction

Evaluating a UI Design

Heuristic Evaluation

What?

- Evaluate design of user interface, according to ***accepted*** principles
- These accepted principles are called ***heuristics***
- Nielsen's "heuristics"

Who?

- Done by a designer, usability specialist, IS professional → ***not*** real users
  - Best results: usability experts who have domain knowledge

User Interface Design Principles ("Heuristics")

Nielsen: Original 10 Usability Heuristics (1990)

Simple and natural dialogue

Speak the user's language

Minimize memory load

Consistency

Feedback

Clearly marked exits

Shortcuts

Good error messages

Prevent errors

Help and documentation

Previously, published guidelines had hundreds or thousands of rules

Nielsen: Revised 10 Usability Heuristics (based on extensive empirical testing)

*Visibility of system status (i.e. feedback)

Match between system and the real world (speak the user's language)

*User control and freedom (undo, redo, clear exits)

*Consistency

*Error prevention

Recognition not recall (minimize memory load)

*Flexibility and efficiency (includes shortcuts, macros)

Aesthetic and minimalist design

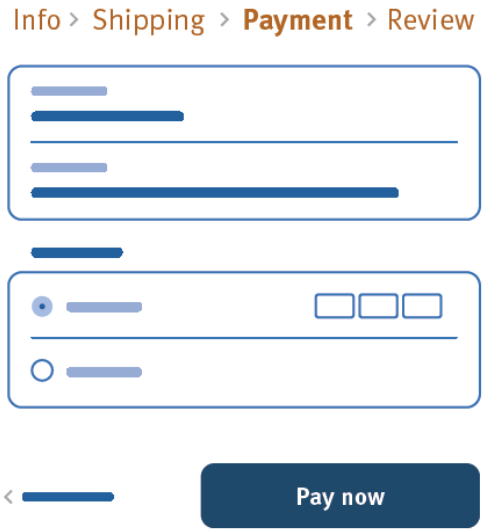
*Help users diagnose and recover from errors

Help and documentation

•H1: Visibility of system status

- Inform users about system behavior
  - o For example, pay attention to response time
    - 0.1 sec: no special indicators needed
    - 1.0 sec: user tends to lose track of data
    - 10 sec: max duration if user to stay focused on action for longer delays, use percent-done progress bars

•H1: Visibility of system status

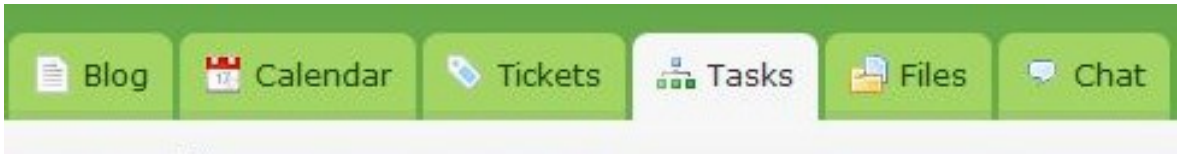


Tip: Communicate clearly to users what the system's state is — no action with consequences to users should be taken without informing them.

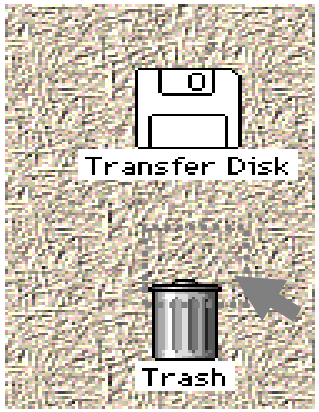
· Tip: Present feedback to the user as quickly as possible.

· Tip: Build trust through open and continuous communication

•H2: Match between system & real world

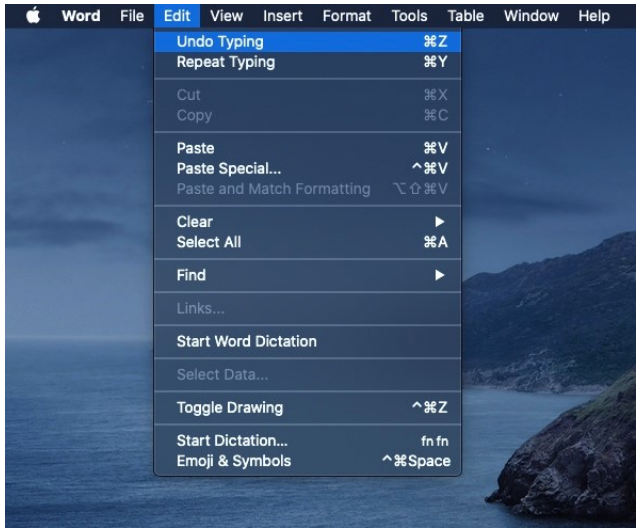


- speak the users' language
- follow real world conventions



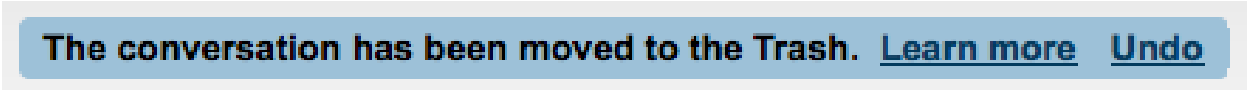
- Bad example (old) Mac desktop
  - Dragging disk to trash
  - logically should delete it, **not** eject it

•H3: User control & freedom



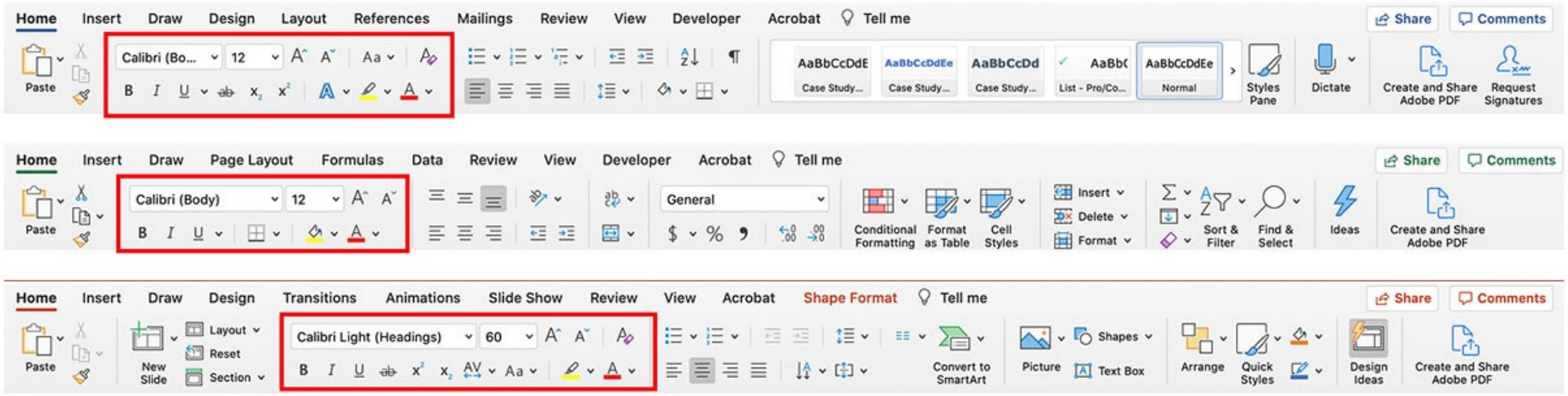
- Wizards
  - Must respond to Q before going to next
  - For infrequent tasks (e.g., modem configuration.)
  - Not for common tasks
  - Good for beginners

- Do not force user down fixed paths
- Clearly marked "Exits" for mistaken choices
- Cancel, Undo and Redo



•H4: Consistency & standards

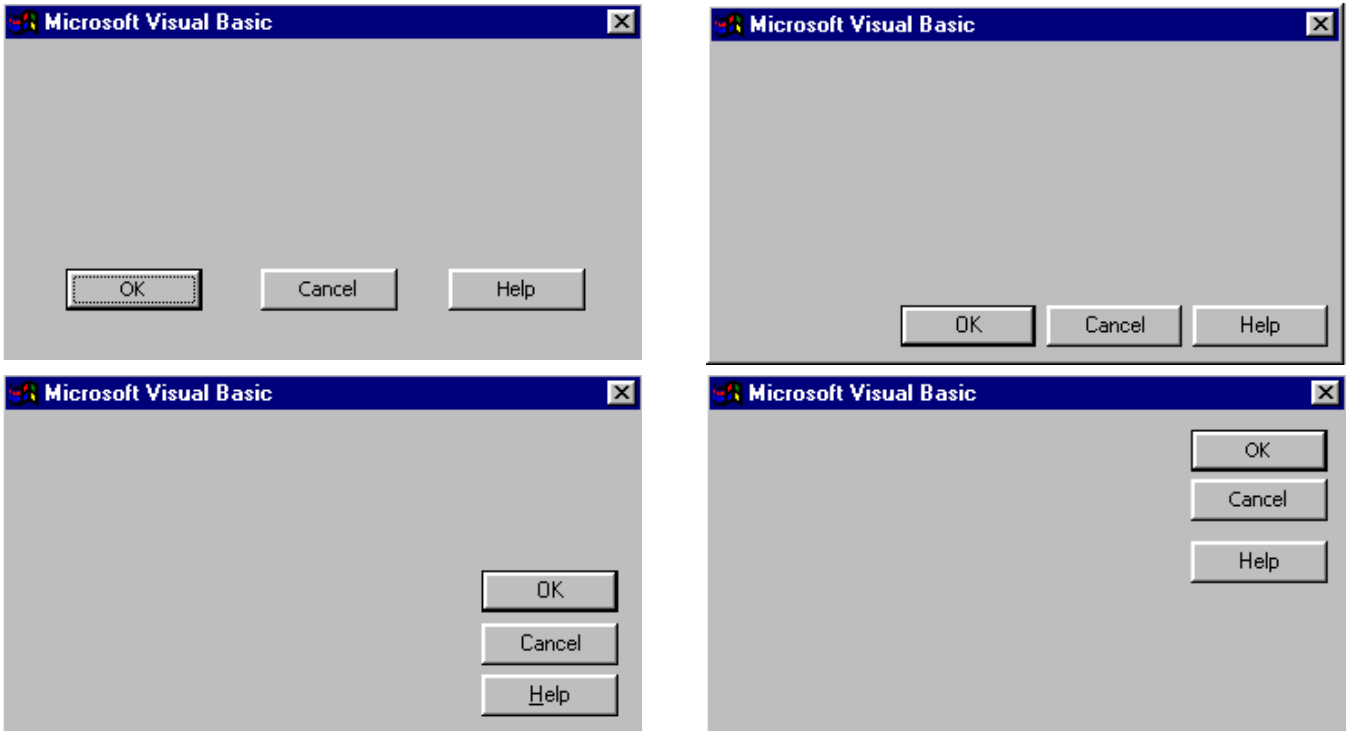
Internal consistency relates to consistency within a product or a family of products, either within a single application or across a family or suite of applications.



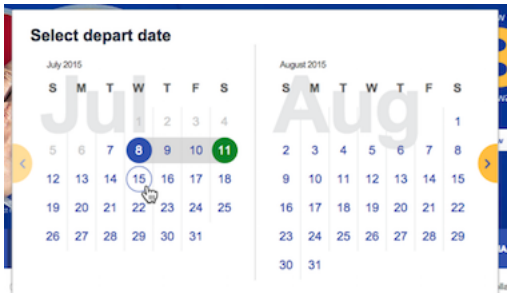
External consistency refers to established conventions in an industry or on the web at large, beyond one application or family of applications.

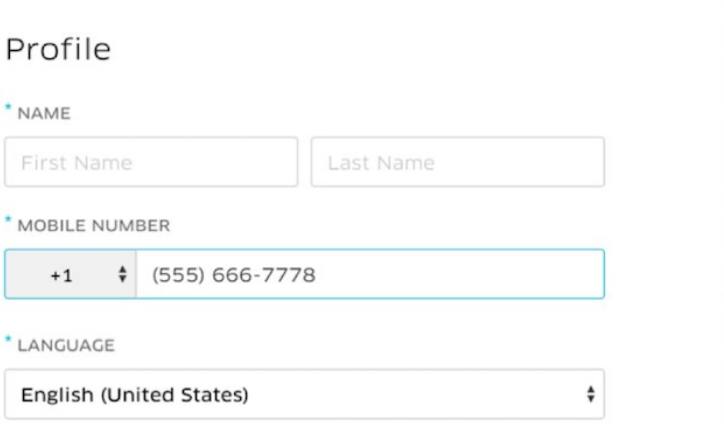
- Ecommerce websites

•H4: Consistency & standards



•H5: Error prevention



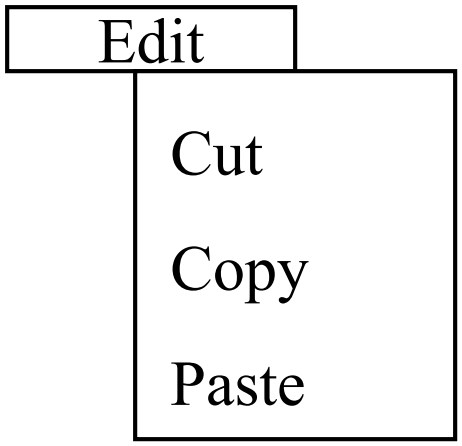


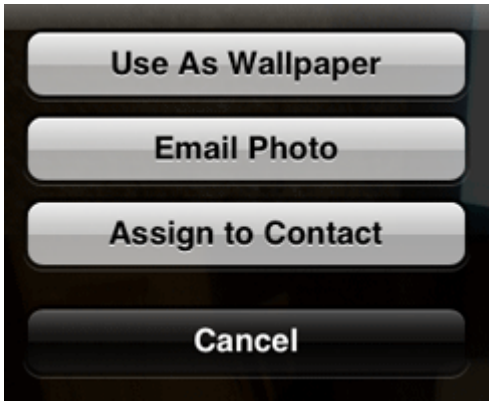
- oInclude Helpful Constraints
- oOffer Suggestions
- oChoose Good Defaults
- oUse Forgiving Formatting

•H6: Recognition rather than recall

- Make objects, actions, options, and directions visible or easily retrievable
  - History and Previously Visited Content (Amazon)
- **Tip:** Let people *recognize* information in the interface, rather than having to remember ("recall") it.
- **Tip:** Offer help *in-context,* instead of giving users a long tutorial to memorize.
- **Tip:** *Reduce* the information that users have to remember.

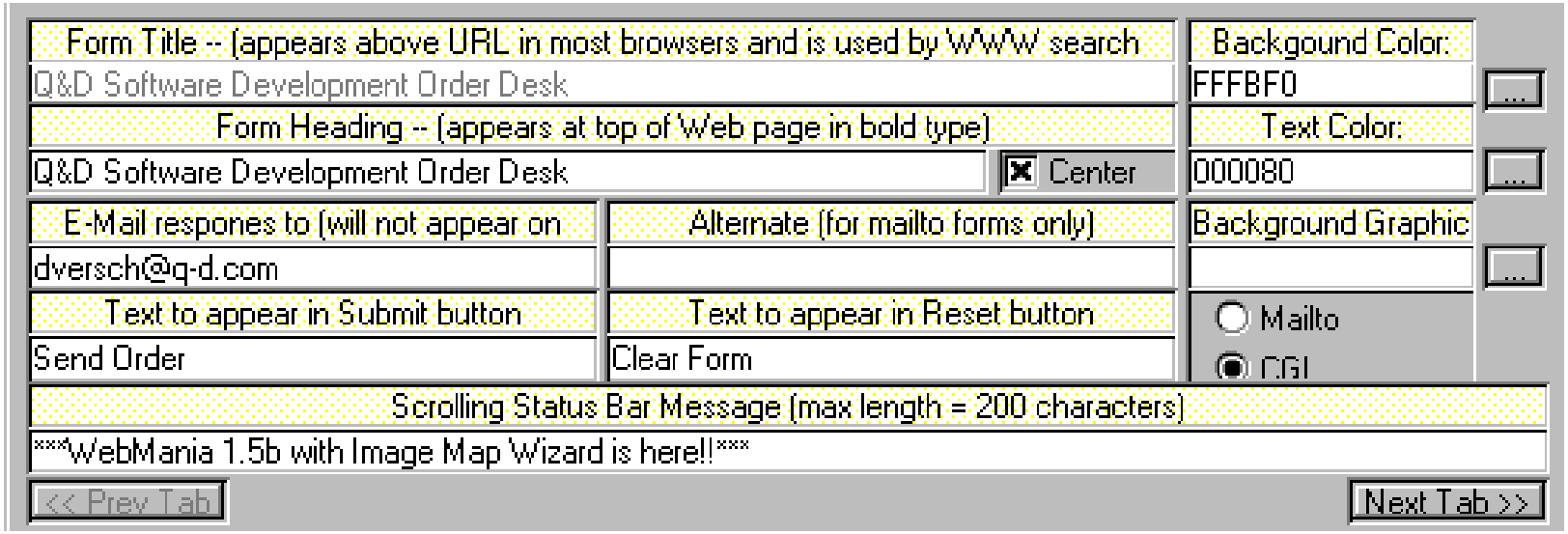
•H7: Flexibility and efficiency of use





- Accelerators for experts (e.g., touch gestures, keyboard shortcuts, etc.)
  - o Allow users to tailor frequent actions (e.g., macros)

•H8: Aesthetic and minimalist design

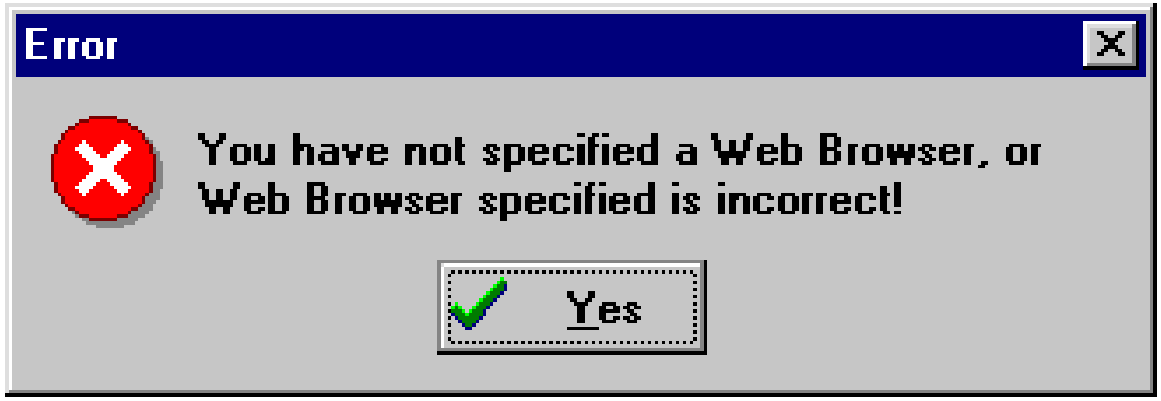


- Only relevant information in dialogues
- Aesthetics of display considered
  - Balance, scale, contrast, visual hierarchy, gestalt principles

- **H8: Aesthetic and minimalist design**

foreground or the background

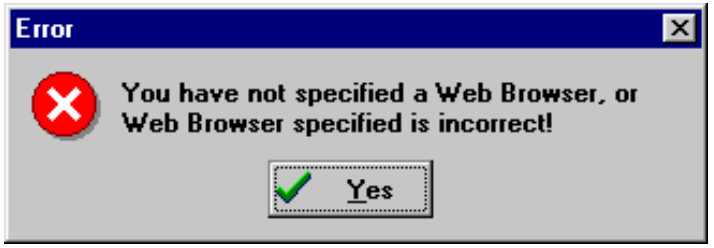
•H9: Help users recognize, diagnose, and recover from errors



- Error messages in plain language
- Precisely indicate the problem
- Constructively suggest a solution

•H10: Help and documentation

- Easy to search
- Focused on the user's task
- Lists concrete steps to carry out
- Can see steps side-by-side with your task



Tip: Ensure that the help documentation is easy to search.

Tip: Whenever possible, present the documentation in-context right at the moment that the user requires it.

Tip: List concrete steps to be carried out