Design for All Principles

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Design for All

- **"Universal Design"** in America
- Also **Inclusive Design**
- Origin: **Ron Mace**
  - **1941-1998**

Design for All

- The process of creating products, services and systems that can be used by the widest range of persons with different capabilities, under the widest range of contexts of use as is commercially practical.
- It is more a working philosophy
  - … than a detailed methodology
- User participation is essential

Universal Design Principles

- 7 Principles for Universal Design (or Design for All)
  - Design of products and environments to be usable by all people
  - There are many aspects influencing the design
    - Cost, culture, environment…
  - Can be applied to:
    - Architecture
    - Engineering
    - Computing (software, web, hardware…)

Universal Design Principles

- Version 2.0 (1997-04-01)
  - NC State University: The Center for Universal Design
  - Authors:
    - Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story and Gregg Vanderheiden

1. Equitable use

- The design is useful and marketable to people with diverse abilities
  - Provide the same means of use for all users: identical whenever possible; equivalent when not
  - Avoid segregating or stigmatizing any users
  - Provisions for privacy, security, and safety should be equally available to all users
  - Make the design appealing to all users

2. Flexibility in Use

- The design accommodates a wide range of individual preferences and abilities
  - Provide choice in methods of use
  - Accommodate right- or left-handed access and use
  - Facilitate the user's accuracy and precision
  - Provide adaptability to the user's pace

3. Simple and Intuitive Use

- Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level
  - Eliminate unnecessary complexity
  - Be consistent with user expectations and intuition
  - Accommodate a wide range of literacy and language skills
  - Arrange information consistent with its importance
 - Provide effective prompting and feedback during and after task completion
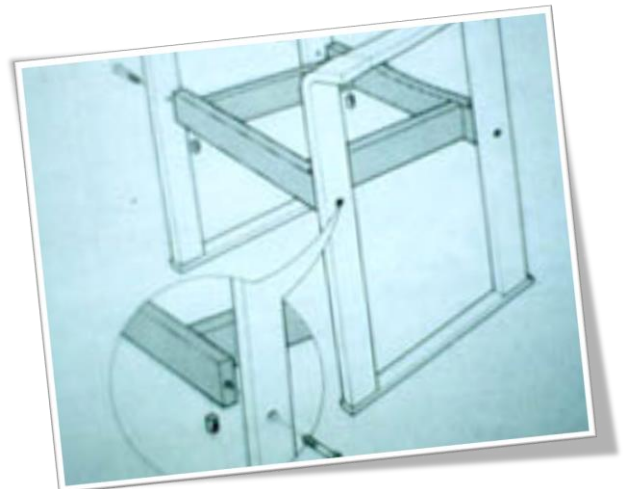
4. Perceptible Information

- The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
  - Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information
  - Provide adequate contrast between essential information and its surroundings
  - Maximize "legibility" of essential information
  - Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions)
  - Provide compatibility with a variety of techniques or devices used by people with sensory limitations

5. Tolerance for Error

- The design minimizes hazards and the adverse consequences of accidental or unintended actions
  - Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded
  - Provide warnings of hazards and errors
  - Provide fail safe features
  - Discourage unconscious action in tasks that require vigilance
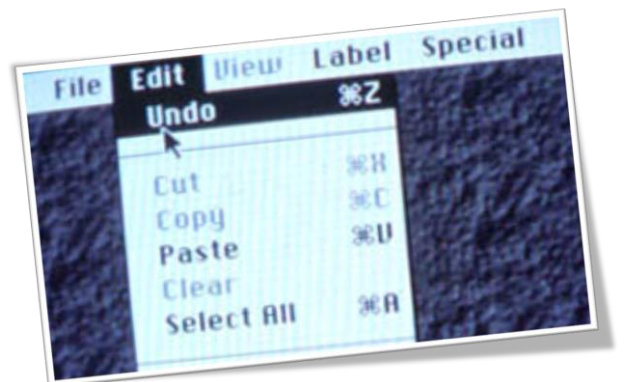
6. Low Physical Effort

- The design can be used efficiently and comfortably and with a minimum of fatigue.
  - Allow the user to maintain a neutral body position
  - Use reasonable operating forces
  - Minimize repetitive actions
  - Minimize sustained physical effort

7. Size and Space for Approach and Use

- Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility
  - Provide a clear line of sight to important elements for any seated or standing user
  - Make reach to all components comfortable for any seated or standing user
  - Accommodate variations in hand and grip size
  - Provide adequate space for the use of assistive devices or personal assistance

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