Universal Design

1. Introduction
    a. Process of designing products so that they can used by as many people as possible in as many situations as possible.
2. Principles - 7
    a. Equitable use: No user is stigmatized. The design is useful to people with range of abilities.
    b. Flexibility in use: the design allows for a range of ability and preference.
    c. Simple and intuitive to use
    d. Perceptible information: the design must provide effective communication of information regardless of environmental conditions or users abilities
    e. Tolerance for error: minimizing the impact and damage caused by mistakes or unintended behaviour.
    f. Low physical effort
    g. size and space for approach and use
3. Multi-Modal Interaction
    a. use of features that take advantage of all 5 senses.
    b. this could however result in increase in bandwidth
    c. Sound in the interface
        i. Especially useful in games
        ii. Little used in standard interfaces
    d. Speech in the interface - issues
        i. structure of speech
        ii. speech recognition
        iii. speech synthesis
        iv. Non speech sound: more advantages
    e. Touch in the interface
        i. used for both send and receive information
        ii. Also known as haptic interaction - 2 areas
            1. cutaneous perception: tactile sensation through skin
            2. kinesthetic: perception of movement and position
    f. Handwriting recognition
        i. Technology: Digitizing tablet, capturing strokes, one every 1/50th of a second
        ii. Recognizing handwriting: Difficult to achieve because of the diverse nature .
    g. Gesture recognition
        i. Control of system, by hand movements.

4. Designing for diversity
    a. users with disabilities: Approx. 10% of population in every country are disabled.
        i. Visual impairment
            1. Two key approaches:
                a. Use of sound as speech, ear cons and auditory icons
                b. use of touch based interactions
        ii. Hearing impairment
            1. supplementary textual versions can be helpful along with other interactions
        iii. Physical impairment
            1. Use of hands including precision of movement could be difficult.
            2. For those with no speech disabilities, speech input could be helpful
            3. Eye gaze system: tracks the eye movement another alternative
        iv. Speech impairment
        v. Dyslexia
            1. speech input is very useful rather than textual information
    b. Designing for different age groups
        i. Older people
            1. Portion of disabilities increase
            2. more than half of people more than 65, have some kind of disability
            3. New communication tools like email and instant messaging can improve social interactions
            4. Mobile tech. can be used to provide memory aids where there is age related memory loss
            5. Technical jargons must be avoided
            6. Must keep in mind that they may have a fear of learning new technologies
        ii. Children
            1. They have different goals, likes and dislikes than adults
            2. Their abilities are different, may have difficulty in using the keyboard or hand-eye coordination
            3. Pen based interfaces could be a useful alternative
    c. Designing for cultural differences
        i. Different symbols may have different meaning
        ii. translations of error messages
        iii. layouts and design might reflect a language

iv. Uses of gestures are different
v. Interpretation of colors.

Graphic Design Basics

1. Placement and Division
    1. Must be aware of all the relationships between "space and elements".
    2. Visual enhancement can be modified by varying the spaces between elements
    3. Must think of cropping a photo, to enhance the details
    4. A center division, usually makes the user confuse, on what to focus.
    5. Line work sometimes aid in organizing the spaces.
2. Grouping
    1. Visual groupings are very important aspect of separation of elements
    2. General visual tendency is to perceive grouped objects in singularity
    3. Attention spans are usually low, so ineffective grouping can result in losing focus on the task
    4. Similar items must be grouped together to avoid any disconnection
3. Emphasis
    1. The designer must decide which element must standout and dominate, by creating a visual hierarchy.
    2. If every element stands out, then the overall design would be chaotic.
    3. Sometimes small presentation in large space attracts a lot of attention
    4. Other times being huge in small space is helpful
    5. Elements with dimensions echo attention as they have an element of reality in them
    6. Color and value is useful in grouping and creating focus
    7. Changing contrast sometimes helps in emphasizing
4. Alignment
    1. Alignment within elements creates a sense of agreement, soundness and unity amongst them
    2. Using grid system to align elements is helpful
5. Icons
    1. Must be communicative image
    2. It must convey a message
    3. When developing real-world icons, must capture the essentials of that image
6. Supporting elements
    1. Line work can be used as a border or divider

    2. Used for separation and organizing elements
    3. It should not attract attention and must be used only when required
7. Color
    1. Primary, secondary, tertiary and complementary colors
    2. Hue, saturation and value
    3. various observations must be used before deciding on one particular color
8. Typography
    1. Font or typefaces
    2. Font points (measurement of size)
    3. Font weight (measurement of how heavy it appears
    4. Must decide based on text justification and alignment