The User Interface Design Process
Step 1 - Know Your User or Client

- Understand how people interact with computers.
- Understand the human characteristics important in design.
- Identify the user’s level of knowledge and experience.
- Identify the characteristics of the user’s needs, tasks, and jobs.

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Step 1 - Know Your User or Client (Continued)

- Identify the user’s psychological characteristics.
- Identify the user’s physical characteristics.
- Employ recommended methods for gaining understanding of users.
Understanding How People Interact with Computers

Some are not computer literate - others are well versed
- problem with “know-it-alls”
- Each type carries baggage that must be dealt with.
- Hostility and fear

People react to the quality of the design
- Psychological: confusion, annoyance, frustration, panic, stress, boredom
- Physical: abandon using system, partially use, or indirectly use, or modify task to avoid use, misuse
Important Human Characteristics in Design

- Perception
- Memory
- Sensory Storage
- Visual Acuity
- Foveal and Peripheral Vision
- Information Processing

- Mental Models
- Movement Control
- Learning
- Skill
- Individual Differences

The program must address the needs of the user.
Important Human Characteristics in Design: Perception

- **Proximity**: objects near each other are perceived as related.
- **Similarity**: objects belong together if they share a common visual property.
- **Matching patterns**: we respond similarly to the same shape in different sizes.
- **Succinctness**: simplicity is easier to remember.
- **Closure**: we establish meaningful wholes.
- **Unity**: objects forming closed shapes are seen as groups.
Important Human Characteristics in Design: Perception (Continued)

- **Continuity**: shortened lines may be automatically extended.
- **Balance**: we desire stabilization or equalization.
- **Expectancies**: we may perceive something missing as being there.
- **Context**: we perceive things in context with their surroundings and environment.
- **Signals versus noise**: noise interferes with signals to the extent they are similar to each other.
Important Human Characteristics in Design: Memory

Not the most stable of human attributes

**Short-term memory:**
- Receives information from both senses and long-term memory but not at the same time.
- Limited amount of information processing takes place.
- Lasts from 10 to 30 seconds

**Long-term memory:**
- Contains the knowledge we possess.
- Information is transferred from short term memory.
- Word recall is important consideration.
Important Human Characteristics in Design: Sensory Storage

- The storage buffer where the automatic processing of information collected from our senses takes place.
- Constantly scans the environment for important things to pass on to higher memory
- Repeated and excessive stimulation causes fatigue of the sensory storage mechanism.
Important Human Characteristics in Design: Visual Acuity

- The capacity of the eye to resolve detail.
- Relative visual acuity is approximately halved at a distance of 2.5 degrees from the point of eye fixation.
- A five-degree circle centered around an eye fixation character is the area of recognition.
- The eye’s sensitivity increases for characters closes to the fixation point and decreases for those characters at the extreme edges of the circle.
Important Human Characteristics in Design: Foveal and Peripheral Vision

- **Foveal Vision**: used to focus directly on something.
  - Main attention area.
- **Peripheral Vision**: senses anything in the area surrounding the location where we are looking.
  - Gives clues as to where to move the eyes next.
  - Competes with foveal vision for attention.
Important Human Characteristics in Design: Information Processing

- Information collected by our senses must be processed in some meaningful way.
- Two levels of information processing:
  - Higher level is identified with consciousness and working memory. It is slow, and sequential and is used for reading and understanding.
  - Lower level processes familiar information rapidly, in parallel with the higher level without conscious effort
Important Human Characteristics in Design: Mental Models

- We develop mental models of things with which we interact.
- They are internal representations of our understanding of something.
- When things conform to our mental models they seem “intuitive.”
- We carry these mental models with us when we enter new surroundings.
Important Human Characteristics in Design: Movement Control

Fitts’ Law: The time to acquire a target is a function of the distance to and size of the target.

Screen designs need to address this fact by:
- Provide large objects for important functions.
- Take advantage of the “pinning” actions of the sides, top, bottom, and corners of the screen.
Important Human Characteristics in Design: Learning

- The process of encoding in long-term memory information that is contained in short-term memory. This requires some effort.
- Designs developed to minimize learning greatly accelerate performance.
- People prefer to be active, explore, and use trial-and-error approach to learning.

Enhance learning by:
- Use skills acquired in one situation in another somewhat like it
- Provide complete and prompt feedback.
- Require a person to know only the information needed at that stage of the learning process.
Important Human Characteristics in Design: Skill

● Skill is the performance of actions or movements in the correct time sequence with adequate precision.
● Characterized by consistency and economy of effort.
● Involves progressive learning of short-cuts, increased speed, and easier access to information or data.
● Lower-order skills tend to become routine and may drop out of consciousness.
● Screen design must permit development of increasingly skillful performance.
Important Human Characteristics in Design: Individual Differences

- There is no average user.
- Typing ability varies widely among users.
- Screen design must permit these users to comfortably learn the task or job.
- GUI screens allow the possibility of tailoring jobs to specific needs of people. (Multiple versions)
Human Considerations in Design

- **Knowledge and experience**: computer, application, task, systems, reading level, typing skill, native language or culture.

- **Tasks and needs**: mandatory or discretionary, frequency of use, task importance, task structure, social interactions, primary training, turnover rate, job category, and lifestyle.

- **Psychological characteristics**: attitude, motivation, patience, stress level, expectations, cognitive style.

- **Physical characteristics**: age, hearing, vision, cognitive processing, gender, handedness, or disabilities.
Human Interaction Speeds

- Performance depends largely on reading level
- Listening is faster than reading.
- Speech recognition is adding new dimension
- Speaking
- Keyboarding
Methods for Gaining an Understanding of Users

- Visit user locations to gain an understanding of the user’s environment.
- Talk with users about their problems, difficulties, wishes and what works well.
- Observe users working on performing a task to see what they do, their difficulties, and their problems.
- Videotape users working or performing a task.
- Learn about the work organization.
- Have users think aloud as they do something.
- Try the job yourself.