**Psychological aspects in HCI**

The ﬁeld of Human-Computer Interactions (HCI) is fundamentally interdisciplinary. The ﬁelds of cognitive, social, and organizational psychology are all important to research in the area, but other social sciences such as sociology and anthropology have played key roles, as have such related ﬁelds as communication, management, operations research, and ergonomics.

The human mind is also an information-processing system.

Human factors psychology examines the capabilities of humans and how these constraints and abilities affect the design. The goal is to design systems with these capabilities and limitations in mind.

The description is approximate when applied to the human, intended to help us remember facts and predict user-computer interaction rather than intended as a statement of what is really in the head. But such a description is useful for making approximate predictions of gross human behaviour. We, therefore organize our description of the psychological science based around a model of this sort to distinguish the simplified account of the present model from the fuller psychological theory we would present in other contexts, we call this model the *Model Human Processor*.

The Model Human Processor can be divided into three interacting subsystems:

(1) The perceptual system,

(2)The motor system, and

(3) The cognitive system, each with its own memories and processors.

The perceptual system consists of sensors and associated buffer memories, the most important buffer memories being a Visual Image Store and an Auditory Image Store to hold the output of the sensory system while it is being symbolically coded.

The cognitive system receives symbolically coded information from the sensory image stores in its Working Memory and uses previously stored information in Long-Term Memory to make decisions about how to respond. The motor system carries out the response. As an approximation, the information processing of the human will be described as if there were a separate processor for each subsystem: a Perceptual Processor, a Cognitive Processor, and a Motor Processor. For some tasks (pressing a key in response to light) the human must behave like a serial processor. For other tasks (typing, reading, simultaneous translation) integrated, parallel operation of the three subsystems is possible, in the manner of three pipelined processors: information flows continuously from input to output with a characteristically short time lag showing that all three processors are working simultaneously.

**The Perceptual System**

The perceptual system carries sensations of the physical world detected by the body's sensory systems into internal representations of the mind by means of integrated sensory systems. An excellent example of the integration of a sensory system is provided by the visual system: The retina is sensitive to light and records its intensity, wavelength, and spatial distribution.

**The Motor System**

Let us now consider the motor system. A thought is finally translated into action by activating patterns of voluntary muscles. These are arranged in pairs of opposing "agonists" and "antagonists," fired one shortly after the other. For computer users, the two most important sets of effectors are the arm-hand-finger system and the head-eye system.

**The Cognitive System**

In the simplest tasks, the cognitive system merely serves to connect inputs from the perceptual system to the right outputs of the motor system. But most tasks performed by a person are complex and involve learning and retrieval of facts or the solution of problems. As would be expected, the memories and the processor for the cognitive system are more complicated than those for the other systems.   
Cognitive issues that must be considered include:-

* **Memory** (span, retrieval, storage capacity).
* **Visual and auditory** capabilities/interpretations.
* **Attention** capacity (selected, focussed, divided).
* The judgment of tone, size, loudness, brightness.
* Interpretation of coding e.g. traffic lights

**The ‘User Model’**

It is what the user thinks happens (within the system).

Much of the user’s model is a logical model of the system. A logical model may be detailed, so the user must know quite a few details to operate the system.

**The ‘System Model’**

It is what really happens (within a complex computer system).

This is the designer’s model (of the system).

Problems for example with User Interfaces can be considered as resulting from ‘mismatches’ between the user’s model of the system and the designer’s model.

The design of HCI is a problem that primarily involves **the designer’s meaning and what the user understands**.