Memory and HCI

Assignment 4

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1. Memory System

There are three types of memory. Sensory memory, which acts as a buffer for stimuli received through all the senses. Sensory memory exists for each sense we have - haptic for touch, echoic for sound and iconic for sight. Short-term memory is where all information is held briefly upon entering our system. Upon entering shirt-term memory, the information does not have long to live - 200 milliseconds is about the maximum time. Short-term memory is also very limited. If not committed to long-term memory, we will lose the information. Long-term memory is much longer and holds the information over a long period of time. There is very little decay but if held for too long, it becomes difficult to recall the information.

1.1 Assisting User Memory

An important aspect of human-computer interaction is finding way to ease the load on a user's memory. In order to understand this concept, it is necessary to understand the basic processes of the human memory. Initially, the computer provides stimuli which can consist of text, audio, and graphics. Next, receptors located in the eyes, ears, and hands pass the information into sensory storage. If this information has any value to the user, it will be transferred into short term memory. Furthermore, this information can be passed into long term memory where it can be called upon at a later time. These concepts can be applied when designing menu's, bookmark's, search's, and other ways of accessing content.

1.2 Briefings

There are three types of memory sensory buffers, short-term, and long-term memory. Sensory buffers will lose memory quickly. Short-term memory or the working memory will store things so you can recall it shortly. Long-term memory will store things for long term so you will not forget them. People have very good multi-modal processors, and are able to gain information from more than one sense. You should not clutter your interface with too much information, because you want to use your short-term memory instead of your long-term memory.

1.3 Minimizing Cognitive Load

This site deals with the aspects of Cognition or the "processing of information from the world around us." It explains that between the interface, there is a lot required of the user (memorizing actions, processing what the application is doing, feedback) It then explains steps and standards to use to minimize the effort on the users' part to make the interaction a more enjoyable and productive experience.

2. Memory Types

Long-term memory has a seemingly unlimited capacity that last years, short-term memory is relatively brief and limited. Chunking information into small groups makes it easier to remember more items for a short period. The information-processing view of memory suggests that human memory works much like a computer.

2.1 Short-term vs Long-term Memory

Once a memory is created, it must be stored (no matter how briefly). Many experts think there are three ways we store memories: first in the sensory stage; then in short-term memory; and ultimately, for some memories, in long-term memory. Because there is no need for us to maintain everything in our brain, the different stages of human memory function as a sort of filter that helps to protect us from the flood of information that we're confronted with on a daily basis. The creation of a memory begins with its perception: The registration of information during perception occurs in the brief sensory stage that usually lasts only a fraction of a second. It's your sensory memory that allows a perception such as a visual pattern, a sound, or a touch to linger for a brief moment after the stimulation is over.

After that first flicker, the sensation is stored in short-term memory. Short-term memory has a fairly limited capacity; it can hold about seven items for no more than 20 or 30 seconds at a time. You may be able to increase this capacity somewhat by using various memory strategies. For example, a ten-digit number such as 8005840392 may be too much for your short-term memory to hold. But divided into chunks, as in a telephone number, 800-584-0392 may actually stay in your short-term memory long enough for you to dial the telephone. Likewise, by repeating the number to yourself, you can keep resetting the short-term memory clock.

Important information is gradually transferred from short-term memory into long-term memory. The more the information is repeated or used, the more likely it is to eventually end up in long-term memory, or to be "retained." (That's why studying helps people to perform better on tests.) Unlike sensory and short-term memory, which are limited and decay rapidly, long-term memory can store unlimited amounts of information indefinitely.

People tend to more easily store material on subjects that they already know something about, since the information has more meaning to them and can be mentally connected to related information that is already stored in their long-term memory. That's why someone who has an average memory may be able to remember a greater depth of information about one particular subject. Most people think of long-term memory when they think of "memory" itself -- but

most experts believe information must first pass through sensory and short-term memory before it can be stored as a long-term memory. To learn how information makes its way out of long-term memory, see the next page. We will explore how memories are recalled and what happens when a memory cannot be retrieved - a phenomenon you might call "forgetting."

3. Attention

Attention is your brain function that allocates cognitive processing resources to focus on information or stimuli. It deals with how you mentally process specific information present in your environment that you are experiencing through your five senses.

3.1 Factors affecting

3.1.1 Interest:

Interest is said to be the mother of attention. We attend to objects in which we have interest. We would like to watch a movie or a serial in TV because we are interested in the subject around which the movie or serial revolves. In any get-together if any subject of our interest is discussed that attracts our attention easily and makes us to participate in the discussion. In our day-to-day life we pay attention to the stimulus we are interested in.

3.1.2 Motives:

Our basic needs and motives to a great extent, determine our attention, thirst, hunger, sex, curiosity, fear are some of the important motives that influence attention, e.g. small children get attracted towards eatables.

3.1.3 Mind set:

Person's readiness to respond determines his attention. If we are expecting a stimulus, occurrence of that stimulus along with many other stimuli may not come in the way of attending to that particular stimulus. At a time when students are expecting the examination time table by the end of the semester the time table put out on the notice board along with other notices would attract their attention easily.

3.1.4 Moods and attitudes:

What we attend to is influenced by the moods and attitudes. When we are disturbed or in angry mood, we notice the smallest mistake of others very easily. Likewise our favourable and unfavourable attitudes also determine our attention. After discussing subjective and objective factors, we realize that these factors are interrelated. How much or in what way we attend to a stimulus depends on subjective as well as objective factors.