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Human Computer Interaction

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Date: 13/05/2020

Q1.a

Concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. Human Computer Interaction, in North America, is often referred to as CHI - Computer-Human Interaction, or MMI - Man-Machine Interface (MMI). Human Computer Interface is the study of the interaction between people, computers and tasks. Human-Computer Interaction involves the development and application of principals, guidelines and methods to support the design and evaluation of interactive systems.

Q1.b

Discretionary Users are more self-directed, not told how to work which that means the In Discretionary Users It is the result, not the means that are more important and Utilisation of the system is not necessary here also will not invest extra effort to use the system, Do not often show high motivation to use system. Interface is extremely important and it is first impression of the system, Discretionary users must cater for many different user types and it is important If the system is not perceived as achieving results with minimum effort, may be refused.¹

For Nondiscretionary Users computer is part of employment which time and effort in learning to use computer are willing invested and a high motivation is often used to overcome low usability characteristics. Productivity is the most important factor but Interface is still important, but the user will be willing to invest time and money for training, Niche application area, one type of user.¹

Q1.c

Human Processes are divided by 4 smaller topic: Perception, Memory, Attention and learning. Perception is fundamental to interacting with computers, To use a computer, a user needs to perceive information that is presented by the interface. Perception can involve all the different senses for example visual, hearing, touch and smell. And as we all know in this days, HCI is mostly concerned with visual perception, because the computer screen is usually the interface. It basically means Perception is what the user see's and feels. anything perceived on a screen is also a result of our prior knowledge and expectations which we call it Constructive Perception.²

Gestalt laws of perceptual organization relate to visual constructive perception which is the following:

- **Proximity:** dots appear as groups rather than a random cluster of elements
- **Similarity:** tendency for elements of same shape or colour to be seen as belonging together
- **Closure:** missing parts of the figure are filled in to complete it, so that it appears as a whole circle
- **Continuity:** the stimulus appears to be made of two lines of dots, traversing each other, rather than a random set of dots
- **Symmetry:** regions bounded by symmetrical borders tend to be perceived as coherent figures

¹ <http://people.csail.mit.edu/emax/papers/Desktop/01549796.pdf> (Last Accessed 13/05/2020).

² <https://medium.com/@avimair/cognition-and-perception-in-hci-e134e3b4401f>(Last Accessed 13/05/2020)

Q2.a

Attention would divide to 4 aspect, Basic forms of attention, Multitasking, Automatic Processing and techniques to guide attention. Basically attention is the data between memory and Processors it's the way we can make sense out of this information and not to suffer from information. The manner in which we deploy our attention has a tremendous effect on how effectively we interact with a system.³

Q2.b

Memory is involved in all our cognitive and it has 3 major components. Sensory Memory, Short-term and long-term memory.

- Sensory memory: A'Snapshot' of our environment, stores this information for a short period Acts as a buffer for stimuli received through the senses but it only holds information for a short time. e.g. visual information fades away in less than a second
- Short-term memory: Information of the present for example a memory of the day what happened, Information retained automatically and retrieved without effort. Amount of information that can be retained is severely limited. a great example of short-term memories is Miller's *chunking* concept (7 ± 2) It is possible for most people to memorise seven items, such as a seven-place number, plus or minus two.⁴
- Long-term memory: Information of the past which stays with us or sometimes we have flash backs, also the amount of information that can be retained is unlimited

Q2.c

We can consider 3 learning styles Visual, Auditory and Kinesthetics, each one of this is important for example visuals learns by seeing and Auditory learns by Listening for example a song we can listen and remember and learn the song or even listening to other languages to learn that language grammar. And Kinesthetics is the way we can learn by doing, moving and touching.⁵

Visual Learners prefer to see information such as Pictures it is easily distracted in lectures with no visual aids. And overwhelmed with intense visuals accompanied by the lecture. Also they benefit from using charts, maps, notes and flash cards when studying.

Auditory Learners Prefer to hear information spoken, they Can absorb a lecture with little effort they May not need careful notes to learn and often avoid eye contact in order to concentrate and also it is possible they may read aloud to themselves.

Kinesthetics Learners Prefer touch as their primary mode for taking information. They should write out important facts in traditional lecture situations. They would create study sheets connected to vivid examples, and they would benefit by using manipulation (e.g. organising notes into a schema).

³ <https://www.simplypsychology.org/information-processing.html> (Last Accessed 13/05/2020).

⁴ <https://www.instructionaldesign.org/theories/information-processing/> (Last Accessed 13/05/2020).

⁵ <https://www.learning-styles-online.com/overview/> (Last Accessed 13/05/2020)

Q3.a

Rather than the traditional design models adopted within software engineering, which are characterized by their linearity, Human Computer Interaction has adopted a design model which aspires to incorporate the following premises:

1. being user centered
2. being multi-disciplinary
3. being highly iterative

also the principles of human-centered design processes for interactive systems is :

- Active involvement of users
- Appropriate allocation of function between the user and the system
- Iteration of design solutions
- Multidisciplinary design teams

Q3.b

Essential activities in human-centered design are to understand and specify the context of use and specify the user requirements, and organizational requirements which that would produce design solutions a great example is prototypes which help to evaluate designs with users against their requirements.

Q3.c

User Centred Approach: is early focus on users and tasks and empirical measurement for example users' reactions and performance to scenarios, manuals, simulations and prototypes are observed, recorded and analysed and Iterative design is for when problems are found in user testing, fix them and carry out more tests.

There are four basic activities in Interaction Design:

1. Identifying needs and establishing requirements
2. Developing alternative designs
3. Building interactive versions of the designs
4. Evaluating designs

To identify needs and establish requirements, one might use a methodology. A user-centred design methodology is characterised by the involvement of users throughout the design process and the use of an iterative design cycle.⁶

⁶ <https://www.interaction-design.org/literature/topics/user-centered-design> (Last Accessed 13/05/2020).