

REG NO: BTIT/461J/2019

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STUDY ASSIGNMENT: BASIC COMPONENTS OF HUMAN COMPUTER INTERACTION

### PART A

1. Define and explain the following terms of interaction.

- A) Domain: This the name that identifies uniquely network a website over the internet.
- B) Goal: An objective someone desires to accomplish.
- C) Task: A piece of work that needs to be done.

2. Donald Norman's model of interaction consists of seven stages. Mention four of these stages and briefly describe their purposes.

- A) **Establishing the Goal:** The initial step where the user determines what they want to accomplish. It defines the desired outcomes of the interaction.
- B) **Formulating the Interaction:** This is the stage where users develop the actual plan to achieve their goal. Its purpose is to create mental plan on how to the goal.
- C) **Executing the Action:** At this stage the user carries out the actual planned actions. Its purpose is to physically do the actions required to achieve the goal.
- D) **Evaluating the System Status:** At this stage the user understands and interprets the response generated by the system. Its purpose is to determine if the action performed has generated the required goal.

3. Explain what is meant by the execution and evaluation loop and explain its importance in designing interactive systems.

It describes the fundamental cycle of how users engage with interactive systems and understand the system response.

#### IMPORTANCE

Understanding this concept the designers can create systems that are:

**Usable:** Users can easily carry out their intended tasks.

**Understandable:** Users can easily understand and interpret systems response.

**Efficient:** Users can easily achieve their goals with less struggles.

### PART B

4. What is ergonomic? Discuss its significance in designing human computer interaction systems.

Also known as human factor. It defines the constraints/standards and guidelines to be followed while designing interactive parts of systems.

**It's significance in HCI:**

**Physical comfort and safety:** It defines factors such as posture seating and design of input devices like keyboards and mice.

**Cognitive Efficiency:** Designing interfaces that are easy to understand and navigate.

**Enhanced Usability:** It improves the usability of the system by the user which is a measure of efficiency.

5. Describe any four common Interactive styles giving an example in each.

A) **Command Line Interface:** Involves users typing commands to be executed in text-based interfaces i.e. using terminal in mac OS.

B) **Graphical User Interface GUI:** Using visual elements like icons menus and windows to represent commands to be executed when user selects the. Example using mouse on browser to click on menu button to toggle item list.

C) **Menu-driven interface:** Representing to a user list with options from which they can select. Example ATM machines where user selects an item like checking balance,

D) **Form-filling Interfaces:** Representing to a user a structured form with fields to be filled with data; Example online registration forms where users fill input fields with information like email address username and password.

6. What are **cascading menus** and **keyboard accelerators**? How do they improve usability in interactive systems.

**cascading menus:** Are menus that branch into a sub-menu when user hove or clicks on them. They allow the organization of large number of commands into a logical group.

It also improves the navigation through complex sets of options

Saves space by making many options into a small group.

**keyboard accelerators:** These are keyboard shortcuts that enable users to perform common actions without using mouse.

Efficiency: Speeds up interaction.

Accessibility: Provides alternative input methods for users finding it difficult to use a mouse.

Flexibility: Allows users to have multiple choices that suites their needs.

### PART C

7. Differentiate between slips and mistakes in human computer interaction. Provide two examples of each and suggest ways to minimize such errors.

**Sips:** Are the errors of execution, user has the correct intention but performs the action incorrectly. Example typing error instead of typing “best” the user types “bes”,

**Mistakes:** Errors of planning or intentional. Example deleting important file because the user thought it was temporary.

**Minimizing such errors:**

**Slips:**

Providing clear visual cues by using distinct icons to help users distinguish between similar actions. Example make delete button different color from save button.

Confirmation Dialogs for destructive actions like deleting.

Reducing physical demands. Design interfaces that require minimal precision efforts.

AutoCorrect/autocomplete. To correct common spelling errors

**Mistakes:**

Provide clear documentation and tutorials.

Offer contextual help.

Validate User input to check for errors before execution.

Improve the clarity of the interface, by labeling all buttons, icons and input fields

**8. Context analysis** helps designers understand environments in which a system is used. Discuss the four concepts of analysis and explain their importance in improving user experience.

**A) Users**

**Concept:** This part involves understanding who will use the system, their characteristics, skills, goals and motives e.g. cultural background and age.

**Importance:** Knowing the users enables the designers to implement specific systems to their needs and abilities.

It helps in designing interfaces that are interactive and easy to learn.

It ensures systems are accessible to all intended users.

**B) Tasks:**

**Concept:** This involves analyzing the actions the user will be performing in the system.

**Importance:**

-Help the designer understand how the user will interact with the system and what functions will be of more importance.

- It enables designers to come up with efficient workflows and streamline the whole process.

- It enables designers identify bottlenecks and areas for improvement.

**C) Environment:**

**Concept:**

- This involves understanding the physical, social and all other cultural environments in which the system will be used. i.e. noise, lighting and cultural norms.

**Importance:**

-Helps designers understand the constraints and available benefits of the environment.

-It enables designing systems that can adapt in different environments.

-Ensure that the system is usable in the real world.

**D) Technology :**

**Concept:** This involves understanding the technology that will be used to implement the system as well as the existing technology in the user's environment.

**Importance:** Enables the design of systems that are compatible with existing technology.

## PART D: PRACTICAL TASK

- a) Flow chart illustrates Donald Norman's seven stages of user interaction in a login system.

