

- **Human-computer interaction is a discipline ?**
  - concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.
- **A basic goal of HCI ?**
  - To improve the interactions between users and computers by making computers more usable and receptive to the user's needs.
  - To design systems that minimize the barrier between the human's cognitive model of what they want to accomplish and the computer's understanding of the user's task.
  - To design and develop devices and systems that are usable, efficient, and safe.
  - To reate devices and systems that are "intuitive" and can be used with a minimum of change and disruption.
  - HCI seeks to make data exchange between people and ICT less stressful and less prone to misunderstandings.
  - This increases the efficiency of tasks that involve both the human and the computer.
- **Design fields ?**
  - Computer Science (User interface Management Systems - Techniques)
  - Cognitive psychology (Perception, attention, learning, thinking)
  - Social and organizational psychology (attitude, behavior, group work)
  - Ergonomics and human factors (safety, performance, adaptation)
  - Linguistics (terminology, multilingual systems)
  - Artificial intelligence (automated behavior)
  - Philosophy (knowledge)
  - Sociology (group behavior)
  - Anthropology (ethnomethodology)
  - Engineering (tools, techniques, equipment)
  - Design (graphic design, layout, colors)
- **Why is it HCI important?**
  - HCI is important because it helps to ensure that technology is designed in a way that meets the needs and expectations of the users.
- **What are the three main components of HCI?**
  - The three main components of HCI are interaction design, information design, and software design.
- **What is the relationship between HCI and user-centered design?**
  - HCI and user-centered design are closely related because both are focused on designing technology that meets the needs and expectations of the users.
  - User-centered design is a design approach that puts the users at the center of the design process, while HCI is a field of study that focuses on understanding and improving human-computer interaction.
- **What is the difference between usability and user experience?**
  - Usability refers to the ease of use and efficiency of a technology, while user experience refers to the overall feelings and perceptions that a user has when using a technology, including the design, functionality, and emotional impact.
- **What is the difference between physical and logical design?**
  - Physical design refers to the physical appearance and layout of a technology, such as the size, shape, and color of buttons or icons. Logical design refers to the way that a technology is organized and functions, such as the navigation and flow of tasks.
- **What is the difference between input and output devices in HCI?**
  - Input devices are used to input data and commands into a computer, such as a keyboard or mouse. Output devices are used to display information or provide feedback, such as a monitor or speaker.
- **What are the five principles of HCI design?**
  - The five principles of HCI design are visibility, feedback, control, consistency, and simplicity.
  - **What is the importance of prototyping in HCI?**
    - Prototyping is important in HCI because it allows designers to test and refine the design of a technology before it is built. This helps to ensure that the technology will be easy and efficient to use and meet the needs and expectations of the users.
- **What is the difference between a desktop interface and a mobile interface?**
  - A desktop interface is designed for use with a desktop computer, while a mobile interface is designed for use with a mobile device, such as a smartphone or tablet.
  - Mobile interfaces often have different design constraints and requirements due to the smaller screen size and the need for touch-based input.
  - **What types of "interactions" matter?**
    - A focus on interaction moves HCI to a consideration of contextual awareness Context: a complex description of shared knowledge about physical, social, historical, or other factors within which an action or an event occurs
- **Direct Manipulation**
  - This is where visible objects on the screen are directly manipulated with a pointing device,
- **Important Human Characteristics In Design ?**
  - Cognitive abilities: This includes attention span, memory capacity, and perception, which can affect how a user processes information presented in the interface.
  - Physical abilities: This includes hand-eye coordination, dexterity, and vision, which can impact the user's ability to use certain inputs and interface elements.
  - Emotional state: The user's mood, stress level, and motivation can affect their experience and engagement with the interface.
  - Cultural background: This includes the user's language, values, and beliefs, which can influence their preferences and expectations for the interface.
  - Prior knowledge and experience: The user's familiarity with technology, similar systems, and related concepts can impact their understanding and use of the interface.
- **Usability goals**
  - Satisfaction (utility, effectiveness, experience)
  - Safety/robustness
  - Efficiency (time, movement)
  - Learnability (to get work done)
  - Memorability (when using infrequently)
- **Information Processing in Human ?**
  - Reasoning is the process by which we use the knowledge we have to draw conclusions or infer something new about the domain of interest.
  - Deductive reasoning derives the logically necessary conclusion from the given premises.
  - Induction is generalizing from cases we have seen to conclude information about cases we have not seen.
  - Abductive reasoning this type of reasoning whereby one seeks to explain relevant evidence by beginning with some commonly well known facts that are already accepted and then working towards an explanation.
- **Three views of how human to solve problems ?**
  - Gestalt view: the earliest, dating back to the first half of the twentieth century is that problem solving involves both reuse of knowledge and understanding.
  - Problem Space Theory: this takes the view that mind is limited information processor. It generating both problem states (initial state and goal state)
  - Analogy in Problem Solving: this is use the analogy while solving the problem, Implemented by mapping knowledge related to the similar domain
- **Mental model ?**
  - Mental model is where People build their own theories to understand the causal behavior of systems.
- Reason for user prefer selecting optional rather than typing method
- Efficiency,accuracy,constitence
- Two limitations of selecting options: Limited options: Selecting options may not be possible when the desired information is not among the provided options
- Inflexibility: Selecting options can be inflexible if the options do not accurately reflect the needs of the user or if they change over time
- Four factors considered when selecting an interaction style:User characteristics: The target audience and their abilities, preferences, and expectations must be considered when choosing an interaction style. Task requirements: The specific tasks the user will perform must be taken into account when choosing an interaction style.
- Context of use: The physical and social context in which the interaction will take place must be considered. Technology constraints: The technology being used, such as the available hardware and software, must be taken into account when choosing an interaction style.
- Five general guidelines that the hospital could have considered when creating the new human-computer interface:
  - Usability,constitence,security,accessibility, feedback
  - Four factors considered when selecting an interaction style:
    - User xtics,task requirement,context of use,technology constraint
- **What are Mental model characteristics ?**
  - Emotion
  - Individual difference
  - Psychology

- Designing of Interactive systems
- **What is Interaction design ?**
  - Interaction design is a process in which designers focus on creating attractive web interfaces with logical and thought out behaviors and actions.
- **Stages in Norman's model of interaction ?**
  - Establishing the goal.
  - Forming the intention.
  - Specifying the action sequence.
  - Executing the action.
  - Recognizing the system state.
  - Interpreting the system state. - evaluation the system state with respect to the goals & intentions
- **HCI design process (McCracken)**
  - Needs analysis
  - User and task analysis
  - Functional analysis
  - Requirements analysis
  - Setting usability specifications
  - Design
  - Prototyping - Evaluation
- **Ergonomics (or human factors)** is traditionally the study of the physical characteristics of the interaction
- **Affordances** are the range of possible (physical) actions by a user on an artefact
- **Mappings** are the relationships between controls and their effects on a system.
- **Constraints** are physical, semantic, cultural, and logical limits on the number of possibilities
- **Causality** is the relation between two events, cause and effect, where the second occurs as a consequence of the first.
- **Usability Engineering** is a method in the progress of software and systems, which includes user contribution from the inception of the process and assures the effectiveness of the product through the use of a usability requirement and metrics.
- **Design process ?**
  - The Design process is a series of steps that engineers or computer scientists follow to come up with a solution to solve a problem.
- **components of design ?**
  - Goal
  - Constraints
  - trade-off
- **Goals of Usability Engineering**
  - Effective to use - Functional
  - Efficient to use - Efficient
  - Error free in use - Safe
  - Easy to use - Friendly
  - Enjoyable in use - Delightful Experience
- **Usability has five quality components:**
  - Ease of learning: how easy is it to accomplish basic tasks the first time people use the system?
  - Efficiency of use: once used to it, how quickly can they perform tasks?
  - Memorability: how easy is it to reestablish proficiency?
  - Error frequency: how many, how severe, recovery?
- **Guidelines for designing (Normans 7 principles)**
  - Use both knowledge on the world and knowledge in head
  - Simplify the structure of tasks
  - Make things visible execute and evaluate
  - Get the mappings right
  - Exploit the power of constraints both natural and artificial.
  - Design for error
  - When all else, standardize
- **Conceptual model.** Conceptual models of interaction are abstract representations that describe how a user interacts with a computer system. They provide a high-level understanding of the system's functionality, organization, and behavior.
- **Shneiderman's Eight Golden Rules of Interface Design ?**
  - Strive for consistency in action sequences, layout, terminology, command use and so on.
  - Enable frequent users to use shortcuts, such as abbreviations, special key sequences and macros, to perform regular, familiar actions more quickly.
  - Offer informative feedback for every user action, at a level appropriate to the magnitude of the action.
  - Design dialogs to yield closure so that the user knows when they have completed a task.
  - Offer error prevention and simple error handling so that, ideally, users are prevented from making mistakes and, if they do, they are offered clear and informative instructions to enable them to recover.
  - Permit easy reversal of actions in order to relieve anxiety andencourage exploration, since the user knows that he can always return to the previous state.
  - Support internal locus of control so that the user is in control of the system, which responds to his actions.
  - Reduce short-term memory load by keeping displays simple, consolidating multiple page displays and providing time for learning action sequences.
- **Principles affecting learnability ?**
  - Predictability: Support for the user to determine the effect of future action based on past interaction history
  - Synthesizability: Support for the user to assess the effect of past operations on the current state
  - Familiarity: The extent to which a user's knowledge and experience in other real-world or computer based domains can be applied when interacting with a new system
  - Generalizability: Support for the user to extend knowledge of specific interaction within and across applications to other similar situations
  - Consistency: Likeness in input-output behavior arising from similar situations or similar task objectives
- **Norman's Seven Principles for Transforming Difficult Tasks into Simple Ones ?**
  - Use both knowledge in the world and knowledge in the head.
  - Simplify the structure of tasks.
  - Make things visible: bridge the gulfs of execution and evaluation.
  - Get the mappings right.
  - Exploit the power of constraints, both natural and artificial.
  - Design for error. To err is human, so anticipate the errors the user could make and design recovery into the system.
  - When all else fails, standardize. If there are no natural mappings then arbitrary mappings should be standardized so that users only have to learn them once.
- **Evaluation has three main goals?**
  - To assess the extent and accessibility of the system's functionality,
  - To assess users' experience of the interaction, and
  - To identify any specific problems with the system.
- **Factors Distinguishing Evaluation Techniques ?** the stage in the cycle at which the evaluation is carried out
  - the style of evaluation
  - the level of subjectivity or objectivity of the technique
  - the type of measures provided
  - the information provided
  - the immediacy of the response
  - the level of interference implied
  - the resources required.
- **Universal design** is about designing systems so that they can be used by anyone in any circumstance.
- **What is Heuristic Evaluation in HCI?**
  - Heuristic Evaluation is a method used in HCI to evaluate the usability of a technology. It involves having a team of evaluators assess the technology against a set of established usability heuristics, or guidelines, to identify potential issues and areas for improvement.
- **Seven General Principles of Universal Design**
  - Principle one is equitable use: the design is useful to people with a range of abilities and appealing to all. No user is excluded or stigmatized.
  - Principle two is flexibility in use: the design allows for a range of ability and preference, through choice of methods of use and adaptivity to the user's pace, precision and custom.
  - Principle three is that the system be simple and intuitive to use, regardless of the knowledge, experience, language or level of concentration of the user.
  - Principle four is perceptible information: the design should provide effective communication of information regardless of the environmental conditions or the user's abilities.
  - Principle five is tolerance for error: minimizing the impact and damage caused by mistakes or unintended behavior.
  - Principle six is low physical effort: systems should be designed to be comfortable to use, minimizing physical effort and fatigue.
  - Principle seven requires size and space for approach and use: the placement of the system should be such that it can be reached and used by any user regardless of body size, posture or mobility.
- **Who performs Heuristic Evaluation in HCI?**
  - Heuristic Evaluation is typically performed by a team of evaluators, such as usability experts, interaction designers, or user experience designers.
- **What are the benefits of Heuristic Evaluation in HCI?**

- Improving the user experience: Usability evaluations provide feedback on the user's experience and identify areas for improvement, leading to a more intuitive, efficient, and satisfying interface.
- Identifying usability issues: Usability evaluations help identify issues and problems with the interface that may impact the user's ability to complete tasks effectively.
- Cost savings: Usability evaluations can identify design problems early in the development process, reducing the cost and time required to make changes later.
- Improving productivity: By improving the interface's usability, users are able to complete tasks more quickly and efficiently, leading to improved productivity.
- Increasing user satisfaction: Usability evaluations can identify features that users find particularly valuable or enjoyable, which can increase overall user satisfaction with the interface.
- Evaluating accessibility: Usability evaluations can also help assess the accessibility of the interface for users with disabilities, ensuring that the interface is usable for all users.
- **What are the most commonly used heuristics in Heuristic Evaluation in HCI?**
  - The most commonly used heuristics in Heuristic Evaluation in HCI include Nielsen's Heuristics, which consist of ten principles for interaction design, such as visibility of system status and match between system and the real world.
- **How does Heuristic Evaluation in HCI compare to other usability evaluation methods, such as user testing?**
  - Heuristic Evaluation in HCI is a quicker and less resource-intensive method for evaluating the usability of a technology compared to user testing. However, it does not provide as much depth and insight into user behavior and perception as user testing does. It is often used as a complementary method to user testing, with the results of both methods being used together to inform the design process
- **What is Task Analysis in HCI?**
  - Task Analysis in HCI is the process of understanding and analyzing the tasks that users perform with technology, in order to design systems that are efficient and effective to use.
- **Why is Task Analysis important in HCI?**
  - Task Analysis is important in HCI because it helps to ensure that technology is designed to meet the needs and expectations of the users. By understanding the tasks that users perform, designers can create systems that are efficient and effective, reducing the risk of errors and increasing user satisfactio
- **How is Task Analysis performed in HCI?**
  - Task Analysis in HCI typically involves observing and interviewing users to understand their tasks and workflows, and then documenting and analyzing the tasks to identify the most important and critical tasks. This information can then be used to inform the design of the technology.
- **What are the different types of Task Analysis in HCI?**
  - There are several different types of Task Analysis in HCI, including Cognitive Task Analysis, which focuses on understanding the mental processes involved in performing tasks, and Physical Task Analysis, which focuses on understanding the physical actions involved in performing tasks.
- **How does Task Analysis inform the design of technology in HCI?**
  - Task Analysis informs the design of technology in HCI by providing a deep understanding of the tasks that users perform and the constraints and requirements of these tasks. This information can be used to inform the design of the technology, including the functionality, user interface, and overall user experience. By designing technology that is optimized for the tasks that users perform, designers can create systems that are efficient, effective, and user-friendly.
- **What is User Support in HCI?**
  - User Support in HCI refers to the various mechanisms and resources that are provided to help users effectively use technology. This can include user manuals, help systems, online forums, and other forms of support.
- **Why is User Support important in HCI?**
  - User Support is important in HCI because it can help to ensure that users are able to effectively use technology, reducing the risk of errors and increasing user satisfaction. Effective User Support can also help to reduce the amount of time that users spend searching for answers or seeking help, which can improve productivity and efficiency.
- **What are the different types of User Support in HCI?**
  - There are several different types of User Support in HCI, including user manuals, help systems, online forums, customer support services, and tutorials.
- **How can User Support be designed to be effective in HCI?**
  - Effective User Support in HCI can be designed by considering the needs and expectations of the users, providing clear and concise information, making it easy for users to find the information they need, and ensuring that the information is up-to-date and relevant. Additionally, providing multiple forms of User Support, such as online forums and customer support services, can help to ensure that users are able to find the information they need, regardless of the situation.
- **How does User Support impact the user experience in HCI?**
  - User Support can have a significant impact on the user experience in HCI. Effective User Support can help to ensure that users are able to effectively use technology, reducing the risk of errors and increasing user satisfaction. On the other hand, poor or ineffective User Support can lead to frustration, decreased productivity, and decreased user satisfaction. As a result, it is important to carefully design and evaluate User Support in HCI in order to ensure that it is effective and meets the needs of the users.
- Three aids that the university could have included in the student portal to enable Peter to use it: screen reader compactibility,alternative text,high contrast mode
- Six indicators of a system with high usability are: learnability efficiency,error recovery,memorability,flexibility
- **Technological considerations in interface design include:** ,screen size and revolution,color depth, os and device type,performance and loading speed,input method(touch, mouse, keyboard), Accessibility and compatibility with assistive technologies
- Various types of statistical graphics used in screen design include: bar chat,line chat,scattered,histogram, pie chat,box plot,heat map
- Don Norman's model of human-centered design, also known as the design thinking model, consists of three main stages: **Empathy:** This stage involves understanding the users and their needs through observation, interviews, and other research methods. **Define:** This stage involves defining the problem and identifying opportunities for improvement based on the user research. **Ideate:** This stage involves generating and prototyping ideas to solve the problem, with the goal of creating a solution that meets the users' needs. Draw User,system,execution,eveluation