CS6008 - Human Computer Interaction

Question Bank

UNIT-I   FOUNDATIONS OF HCI

Part – A

1. Define HCI
2. What are the basic requirements of an Successful Interactive System?
3. What is STM & LTM?
4. List out the types of Reasoning methods
5. What are the types of text entry devices?
6. What is Execution Evaluation cycle?
7. Draw the Norman's Model diagram for Execution Evaluation Cycle
8. Define Ergonomics
9. Define Interaction & what are the styles used for Interaction?
10. What is paradigm?
11. Discuss the elements of WIMP
12. State the Categories of Devices
13. Differentiate the usage of keyboard with mouse?
14. What are the basic levels of skills identified by Anderson's ACT model?
15. Define usability
16. Differentiate between short-term and long-term memory.
17. Identify human characteristics in design?
18. What is problem solving?
19. Define mental model
20. Define sensors & effectors

Part – B

1. Describe the following
    a) Human & Computer Memory(8)
    b) Reasoning & Problem solving(8)
2. Explain in detail about Various types of devices
3. Explain the following
    a) How the user performance is improved using ergonomics? discuss (8)
    b) Interaction styles(8)
4. Explain HCI in detail
5. Discuss in detail about Interactive Models & framework
6. Draw the block diagram representing human-computer interaction framework and discuss it

UNIT-II

DESIGN & SOFTWARE PROCESS

Part – A

1. What are the goals of design?
2. State the Golden rule of Design
3. Draw the process of Design
4. How the complexity of interactive system design will be reduced by the interaction & prototyping?
5. Define Internalization of a System? Why it is necessary?
6. List out the activities in software life cycle
7. What is Usability Engineering?
8. What are the prototyping approaches used?
9. Define Design Rationale
10. State the Principles that support Usability
11. List out the categories of Smith & Mosier guidelines
12. What is Evaluation? List out the techniques
13. Define Heuristic Evaluation
14. What are the factors need to be considered to select an Evaluation Method?
15. Why Universal Design is important?
16. Differentiate Multimedia & Multimodal Systems

Part – B

1. Explain about the usability engineering related to design process.
2. Discuss about the design rules, principles, standards & guidelines applied to design an interactive system
3. Describe the following
   a) HCI in software process(8)
   b) Interaction Design Process(8)
4. Explain in detail about the basics of Interactive Design
5. Discuss in detail about design Rationale & Prototyping Approaches
6. Explain in detail about the Evaluation Techniques
7. Explain the following
   a) Screen Design(8)
   b) Universal Design(8)

UNIT-III

MODELS AND THEORIES

Part – A

1. What is major classification of models?
2. What are the types of cognitive models?
3. Define GOMS
4. State the Cognitive complexity theory
5. Discuss about three state model
6. List out the organization issues that affect the acceptance of Information Communication System
7. Define the term CSCW
8. Who is stakeholder? & List out the categories
9. State the Free rider problem
10. What are the approaches used for capturing the requirements?
11. What is ETHICS?
12. Compare CUSTOM, OSTA Methodologies
13. Deiine Backchannel
14. Describe Basic conversation structure with adjacency pairs
15. What are the four types of textual communications?
16. Define HyperText
17. List out the Components of Multimedia
18. Differentiate Static & Dynamic Web Content
19. Draw the structure of Linear Text & Hyper Text
20. Discuss in detail various issues involved in designing an icon.

Part – B

1. Explain in detail about cognitive Model
2. Discuss in details about socio organizational Issues & Stakeholder Requirements
3. Explain in detail about communication & collaboration models
4. Describe the following
   a) HyperText (8)
   b) Multimedia(8)
5. Explain the following
   a) Face to Face Communication(8)
   b) WWW(8)

UNIT-IV

MOBILE HCI

Part – A

1. What is Mobile Ecosystem?
2. List out different types of the 2G & 3G networks
3. List out the types of mobile applications
4. Define Information Architecture
5. What is the role of mobile information architect? Who can play that role?
6. State the use of Sitemap
7. Define the term Click Stream
8. What is Wireframe?
9. Define Prototyping & state its types
10. Discuss the principles of Mobile2.0
11. What is Mobile 2.0?
12. State Mobile Design Tent Pole
13. List out the Mobile Design Elements
14. Define Typography
15. Discuss the issues to be considered in choosing colors for Mobile screens

Part – B

1. Explain in detail about Mobile Eco System
2. Describe the following
   a) Mobile Design Elements (10)
   b) Mobile Design Tools (6)
3. Discuss in detail Mobile Information Architecture
4. Explain the various types of mobile application
5. Describe the following
   a) Mobile 2.0 and its principle (8)
   b) Mobile Design (8)

1. Define HCI

It is the study, planning and design of how people and computer work together so that a person needs are satisfied in the most effective way.

2. What are the basic requirements of an Successful Interactive System?

The following 3 words must be true for a product to be successful

Useful : Accomplish what is required

Usable : Do it easily & naturally without danger of error

Used : Make people want to use it(Be attractive)

These are the basic requirements of an interactive system

3. What is STM & LTM?

STM :Short term memory-act as a scratch pad for temporary recall of information. Information can only be held there temporarily In order of 200ms- has limited capacity

LTM: Long term memory –stores factual information, experiential knowledge an srules.-stores information in a semantic network form

4. List out the types of reasoning methods

Reasoning: Inferring new information from what is already known- is a process by which we use the knowledge to draw some conclusion for a problem.Types:
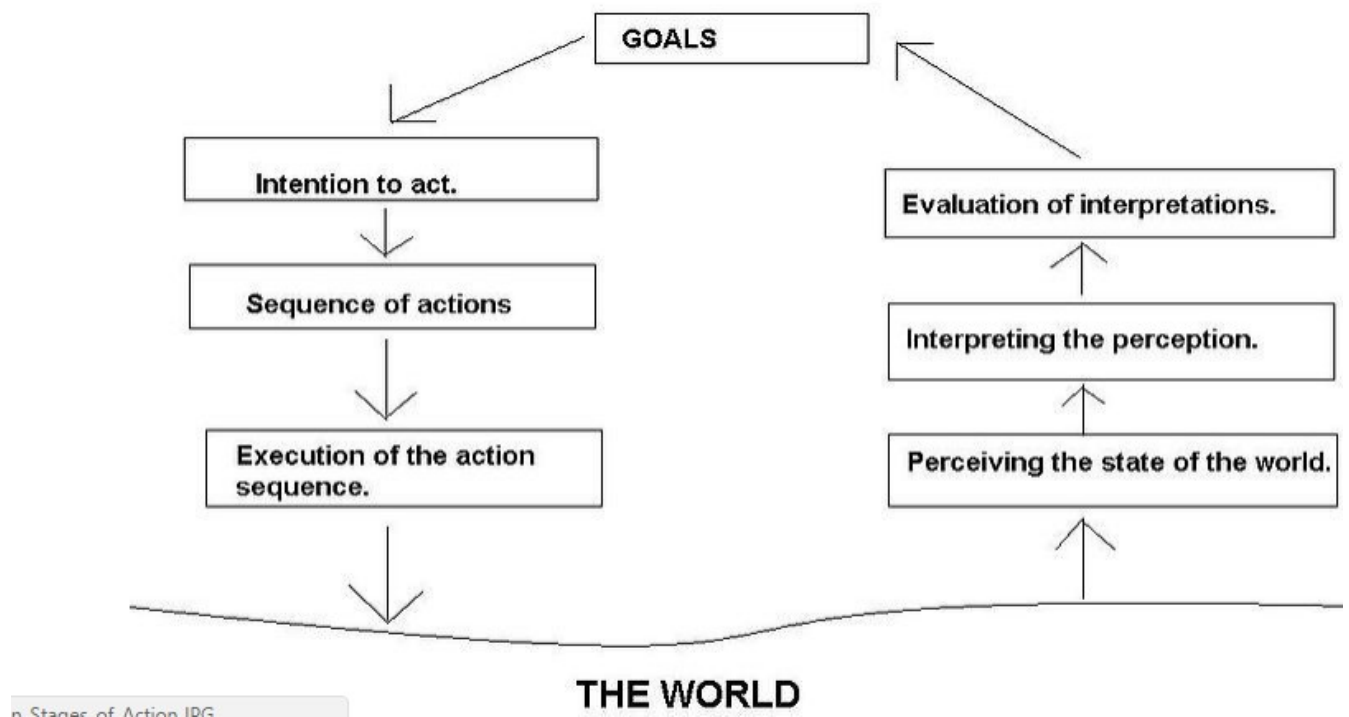
Deductive

Inductive

Abductive

5. What are the types of text entry devices?

Keyboard, Chord Keyboard, Phone Pad, Handwriting recognition & Speech recognition

6.What is Execution Evaluation cycle?

In Norman's Model, User formulates a plan, Executed at the computer interface. when plan has been executed, user observes the computer interface to evaluate the result of the executed plan and determine future action. This cycle has two phases, Execution & Evaluation phase.

7. Draw the Norman's Model diagram for Execution Evaluation Cycle

GOALS

Intention to act.

Sequence of actions

Execution of the action sequence.

Evaluation of interpretations.

Interpreting the perception.

Perceiving the state of the world.

THE WORLD

n Stages of Action IPG

8.Define Ergonomics

Ergonomics are human factors –is a study of the physical characteristics of the interaction. That is,how the controls are designed, In which physical environment the interaction takes place, layout & physical qualities of the screen. The main focus is on User performance

9.Define Interaction & what are the styles used for Interaction?

Interaction is a dialog between the computer and user.The no. of styles are,

- Command Line Interface
- Menus
- Natural Language
- Question / Answer and Query Dialog
- Form fills and spread sheets
- WIMP
- Print & click
- 3D Interfaces

10. What is paradigm?

A successful Interactive system can serve as paradigms fro the development of future products

Concerns

  – how can an interactive system be developed to ensure its usability?

  – how can the usability of an interactive system be demonstrated or measured?

History of interactive system design provides paradigms for usable designs

11. Discuss the elements of WIMP

WIMP elements are,

- Windows
- Icons
- Menu
- Pointers

12. State the Categories of Devices

1. Text entry devices
2. Positioning & Printing Devices
3. Display devices
4. Devices for Virtual reality & 3D Interaction
5. Physical Controls, Sensors & Special Devices

13. Differentiate the usage of keyboard with mouse?

Keyboard	Mouse
Keying process becomes fast and well learned	Mouse is slower and it has tendency to move about the desk.
It remains in the same spot. Its location can be memorized.	Its location cannot be memorized

14. What are the basic levels of skills identified by Anderson's ACT model?

There are 3 levels,

1. Learner uses general purpose rules which interpret facts about a problem.(This is slow & demanding on memory access)
2. Learner develop rules specific to the task
3. The rules are tuned to speed up performance

15. Define usability.

It describes the effectiveness of human performance. It can be defined as the capability to be used by humans easily and effectively.

16.Differentiate between short-term and long-term memory.

Short –term	Long-term
Contains limited amount of information	Contains unlimited amount of information
Receives information from either the senses or long term memory	Receives information from short term through learning process.

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17.Identify human characteristics in design?

The important human characteristics in design are perception, memory, visual and peripheral vision, sensory Storage, information processing & skill and individual differences.

18. What is problem solving?

It is a process of finding a solution to an unfamiliar task, using the knowledge we have
No. of views are

Glestall view- Productive problem solving, Reproductive problem solving

Newell & Simon's View: Problem space

19.Define Mental model

It is an internal representation of a person's current conceptualization and understands of something.Mental model are gradually developed in order to understand, explain and do something.

20. Define Sensors & Effectors

Input in the human occurs mainly through the sensors and the output through the motor control of the effectors

Five major senses: Sight, Hearing, Touch, Taste, Smell

Five major Effectors: Limbs, Fingers, Eyes, Head, Vocal System,

UNIT-II
DESIGN & SOFTWARE PROCESS

1. What are the goals of design?

The main goal of an interactive system design is Maximize the usability. Design means "Achieving the goals within the constraints". The goals are determine the purpose of the design, identify the users & why do they want?

2. State the Golden rule of Design

The golden rule of design is "Understand Your Materials". For Human computer Interaction the obvious materials are the human and the computer.

Understand the computer: Limitations,Capacities,Tools & Platforms

Understand People : Psychological,Social aspects, Human Error

3. Draw the process of Design

- o Requirements :what is there and what is wanted …
- o Analysis :ordering and understanding
- o Design :what to do and how to decide
- o iteration and prototyping :getting it right … and finding what is really needed!
- o implementation and deployment :making it and getting it out there
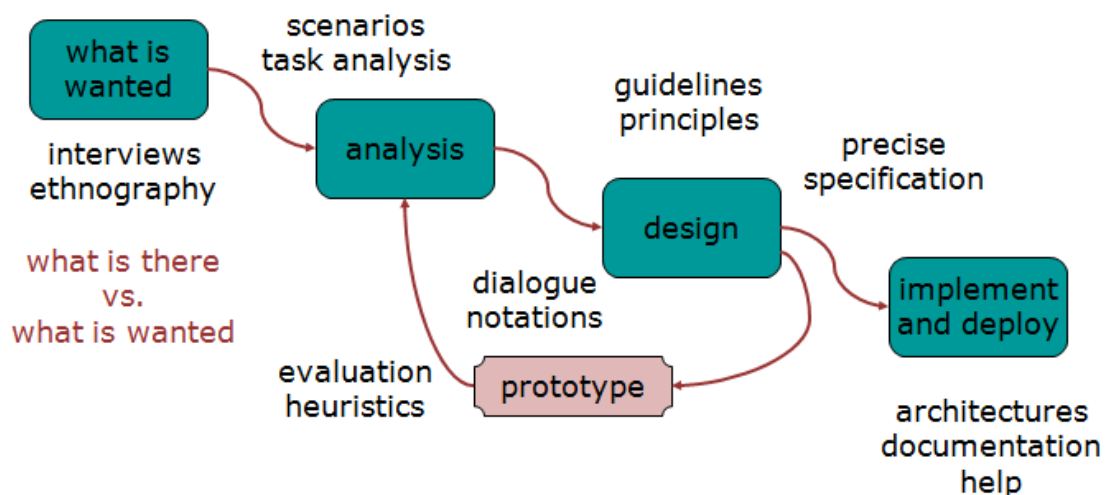
4. How the complexity of interactive system design will be reduced by the interaction & prototyping?

Due to complexity , the first design will not be perfect (human situations are complex). For this reason, all interaction design includes some form of iterations of ideas.
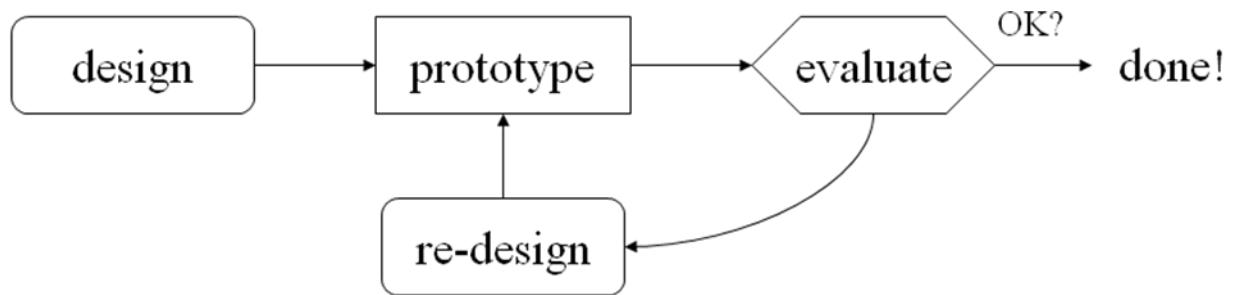
Starts early on with paper design-create protype version of software-Evaluate it- Result of evaluation-Redesign the exercise,prototype & evaluate. End point is one where there is no more problems can be fixed.Thus iterative & prototyping is universally accepted.

5. Define Internalization of a System? Why it is necessary?

Process of making a software suitable for different languages & culture is called Internationalization. Internationalization (sometimes shortened to "I18N , meaning "I - eighteen letters -N") is the process of planning and implementing products and services so that they can easily be adapted to specific local languages and cultures, a process called localization . The internationalization process is sometimes called translation or localization *enablement*. internationalization occurs as a fundamental step in the design and development process,

6. List out the activities in software life cycle

Software life cycle is an attempt to identify the activities that occur in software development. The various activities are,

- Requirement Specification
- Architectural Design
- Detailed Design
- Coding & Testing
- Integration & Testing
- Operation & Maintenance

7. What is Usability Engineering?

Usability engineering is used to determine to what degree a product or prototype will be user-friendly. It often pertains to the field of software development.

Usability is all about how users interact with technology, and usability engineering studies the human-computer interface (HCI) in depth. Usability engineering requires a firm knowledge of computer science and psychology and approaches product development based on customer feedback.

A usability engineer works hand-in-hand with customers, working to develop a better understanding of the functionality and design requirements of a product.

8. What are the prototyping approaches used?

Iterative design overcomes inherent problems of incomplete requirements Prototypes simulate or animate some features of intended system different types of prototypes

- throw-away
- Incremental
- Evolutionary

9. Define Design Rationale

Design rationale is information that explains the structural/Architectural description, Functional/Behavioral description of a system. It relates to an activity of both reflection & documentation

Benefits of design rationale
- Communication throughout life cycle
- Reuse of design knowledge across products
- Enforces design discipline
- Presents arguments for design trade-offs
- Organizes potentially large design space
- Capturing contextual information

10. State the Principles that support Usability

Usability describes the effectiveness of human performance. It can be defined as the capability to be used by humans easily and effectively. The principles that supports usability are,

- abstract design rules
- low authority
- high generality

The Abstract Design Rule are divided into 3 main categories (by DIX)

- Learnability: ease with new user

- Flexibility : Multiple ways in which user, system exachange information
- Robustness : Level of support provided to the user

11. List out the categories of Smith & Mosier guidelines

Guidelines are Lower-level, more specific than principles.The basic categories of smith & Mosier guidelines are,

- Data entry
- Data Display
- Sequence control
- User guidance
- Data Transmission
- Data Protection

12. What is Evaluation? List out the techniques

Tests the usability, functionality and acceptability of interactive system. It occurs throughout the design Life cycle and the results of evaluation feedback into modifications to the design. The various evaluation techniques are,

- Evaluation through Expert Analysis
- Evaluation through User participation
- Evaluation through Observation Techniques
- Evaluation through Monitoring physiological Response

13. Define Heuristic Evaluation

Heuristic is a guideline \rule\Thumb to critique a system. It is useful for evaluating early design. It is flexible & cheap. It evaluates independently critique a system come up with potential problem

14. What are the factors need to be considered to select an Evaluation Method?

- Stage in the cycle at which the evaluation is carried out
- Style of Evaluation
- Level of Subjectivity\Objectivity of the technique
- Types of Measures provided
- Information Provided
- Immediate of the response
- Level of Interference implied

- Resources required

15. Why Universal Design is important?

Universal design makes thing more accessible, safer and convenient for everyone. It also called Design for all or Inclusive Design. It is a philosophy that can be applied to policy, design and other practices to make products, environments and systems. It functions better for a wide range of people.

16. Differentiate Multimedia & Multimodal Systems

- Multi-modal systems

use more than one sense (or mode) of interaction, Multimodal systems process two or more combined user input modes – such as speech, pen, touch, manual gestures, gaze, and head and body movements – in a coordinated manner with multimedia system output.

e.g. visual and aural senses: a text processor may speak the words as well as echoing them to the screen

- Multi-media systems

use a number of different media to communicate information

e.g. a computer-based teaching system:may use video, animation, text and still images: different media all using the visual mode of interaction; may also use sounds, both speech and non-speech: two more media, now using a different mode