HMI Module - 2

Q1. What is a design process?

Ans:

- To make a user-friendly interface, research and proper survey must be done to make a proper design which satisfies the users.
- Designers should work like researchers to perform the user interface requirement survey.
- All product based companies will carry out their own market research to identify the needs of the various types of users.
- There are 5 phases:

a. Requirement Gathering:
    - Important phase as it collects requirements.
    - It focuses on market surveys, conducting user interviews, and generating actual information about users.
    - This phase will produce information about people involved in product usage and the expectations.

b. Analysis:
    - This will help understand user requirements in detail.
    - Analysing potential application domain.
    - Identifying the financial side of the information gathering and dissemination.
    - Find out data complexity.

c. Iteration and Prototyping
    - This phase will represent the prototype of actual product design and framework for the system behaviour.
    - It helps create storyboards at a very high level of detailing.

d. Implementation Phase:
    - Implementation is the finalisation of the design.
    - Implementation completes after delivering the product to the intended party.

e. Deployment and Support Phase:
    - The product is released and available for the users.
    - After the deployment, the maintenance and refining of the product is required as it is difficult to carry out all the challenges.
    - The system has to continuously improve and try to meet all future requirements.

Q2. What is a goal directed design process?

Ans:

- Goal-Directed Design combines techniques of ethnography, stakeholder interviews, market research, product/literature reviews, detailed user models, scenario-based design, and a core set of interaction principles and patterns.

- It provides solutions that meet the needs and goals of users, while also addressing business/organisational and technical imperatives.
- There are 5 phases:

a. Research Phase:
    - This phase will help understand the gap between user and developer.
    - It focuses on market survey, conduction user interviews and user observations.
    - It will generate actual user information.
    - It will help to identify behaviour patterns of various users and modelling phase.
b. Modelling Phase:
    - Output of research phase is converted to user model.
    - User model includes information flow and workflow.
    - This phase will help understand the user.
c. Requirement Definition Phase:
    - This Phase provides the needed connectivity between user, models, and product framework.
    - Important phase as it gathers requirements.
d. Framework Phase:
    - This phase will present the actual product design and framework for the system behaviour.
    - It also proposes product interaction framework.
    - It also explains colour schemes and visual styles of the user's expectations.
e. Refinement Phase:
    - It mainly emphasises on the details of the system and product implementation.
    - Helps create storyboards at a very high level of detail.

Q3. Explain various types of users as per their experience level.

Ans:

- The main goal of a designer is to identify whether the user is an expert or a beginner.
- This understanding may help designers to design systems as per designated user requirements.
- The system users do not belong to similar groups of expertise as they are a mixed bunch of people.

a. Beginner User:
    - Every user is a beginner at an earlier phase of their life.
    - To make beginner users to intermediate designers, we must ensure that the things they see and use UI remain in their mental models.

- They tend to use menus and messages, reading all the labels and understanding of location where specific options and features are placed.
- For dialogs and notifications, users may refer to them slower, trying to understand them thoroughly.
- Beginners may require a lot of help from the system to understand the process.

b. Intermediate User:
   - Intermediate users are always looking for desired features and way to easily access them.
   - Intermediate level users will have some different requirements.
   - The basic skill to operate system is already known to them.
   - As they are familiar with basics they will now find out new techniques to operate system very effectively.
   - Majority numbers of users are intermediates.

c. Expert User:
   - The number of expert users is always smaller than other types of users as they become expert by longer experience and excellent skill set.
   - Experts are a very important group of users although their number is very small as their effectiveness is very high.
   - As always, companies trust experts and ask them for advice as well as design help.
   - Experts may know additional functionalities and abilities of the system to perform all tasks.
   - Experts always look for customization of automation in available systems.

Q4. Explain how to understand the user?

Ans:

- The success of any digital system is linked to the ability of understanding the users, owners and stakeholders' requirements.
- The main goal of a system designer is to understand the user to create the best design possible.
- The user's experience will help the designer into making a better system for usability.
- The knowledge of user experience cannot be gained by quantitative study during market research.
- Qualitative study focuses on enhancement of the system by making decisions based on relevant information gained during a study, such as:
  a. Stakeholder interview
  b. User interview
  c. Domain expert interview

d. Customer Interview
e. System Interface Design Audits.

Q.5 How to implement a mental model in reality?
Ans:

- Mental models play an important role in Human-Computer Interaction (HCI) and interaction design.
- They relate to the way that a user perceives the world around them and are based in belief.
- If a designer can understand users' mental models, he can simulate these models within his designs to make them more usable and intuitive.
- However, they can only do this successfully if they truly understand their users' mental models.
- It is an all too common failing of designs for designers to base their ideas on their own mental models; their models are often too complete and detailed to bear any relationship with a user's model.
- This in turn leads to failure in UI where the user does not find their mental model and is left confused and frustrated.

Q6. Write short notes on Modelling Personas and goals of users.

- Systems may have many types of users, all of them are different.
- The observations of the system end users may give some models to represent human behavioural patterns.
- Personas:
    - Personas are descriptions of individual people who represent groups of users that would interact with your system. You use them to guide your design.
    - The user's behaviour and the way they think will help the developer to accomplish the things they want to do with the system.
    - Personas are designed by behavioural data gathered from many users from which we capture some percent of information.
    - Personas may help to determine, communicate, measure and contribute to the design quality of the product.
    - Personas are represented as individual people or groups of users.
    - Personas can be adopted by various techniques:
        a. Identify user behavioural pattern.
        b. Arrange interview as per user behaviour.
        c. Generate various user characteristics and relevant goals.
        d. Explain all attributes and behaviour of users.
- Goals:
    - Design goals are basic drivers for users.

- Persona without a goal may be an effective tool but goal serves as a magnifier through which the designer examines the product and may refine it.
- Goals will motivate the usage pattern to get better results after using the product.

Q7. What is universal design process?
Ans:

- Universal design is the process used for designing products so that they can be utilised by maximum people.
- It must provide a uniform user experience.
- Design must be simple and cost effective.
- Seven Principles of Universal Design:

1. Equitable Use:
    - The design must be usable for a wide range of audiences.
    - Similar type of access for all range of audiences.
    - Proper security and privacy should be provided.
2. Flexible:
    - It allows for a wide range of individual preferences and abilities.
3. Simple and Intuitive:
    - Design must be simple and intuitive with regards to language, experience of user, lifestyle and expectations.
    - System Design should not be complicated unnecessarily.
4. Perceptible Info:
    - It communicates effectively to the user, regardless of distractions in the environment or the user's sensory abilities.
    - Design must be supported on all types of devices.
5. Tolerance for Errors:
    - Minimising effects which happened due to errors.
    - System must be safe from any failure or data loss.
    - Potential conditions must be shown through warning.
6. Low Physical Efforts:
    - System should be comfortable to use and should not give any physical stress to the user while using the system.
7. Size and space for approach and use:
    - Users shouldn’t face any issue for reach, manipulation, and use regardless of the user's body size, posture, or mobility.

Q8. Mistakes Performed While Designing:
Ans:

- System designers may have assumed that the end user knows everything about the system and understands all necessary action required to use the system.

- Developers may deliver only targeted tasks of the system and may overlook some important functions required for system design which may cause failure of the system.
- General errors due to assumptions about the users:
    a. End user knows everything.
    b. End user understand complex operations.
    c. End user behaviours can be ignored.
- If a system designer overlooks the end user's skill and knowledge, it leads to poor system design.

Q9. Usability Engineering
Ans:

- Software engineering deals with software development processes related to software life cycle.
- However, usability engineering is based on basic designing and detailed designing, software life cycle processes and working model.
- It allows use of diverse ideas and criterias to determine the success of working model and its use in different fields.
- Major decisions taken initially in the basic design phase and feedback analysis at each and every phase is very important in usability engineering.
- Prediction analysis during iteration and prototyping affects a lot as well.
- Decision Support System is very important as it has to convey exact track of working style.