

Q. What are the benefits of good design? Explain.

Ans- (I) Attracts Attention :-

- Good design makes a product, website, or idea appealing.
- It helps in catching the interest of people quickly.

(II) Improves Usability :-

- A well-designed product or system is easy to use.
- User can find information or perform tasks without confusion.

(III) Builds Trust and Credibility :-

- Professional and neat design creates a positive first impression.
- People trust brands, websites, or products that look well-organized.

(IV) Enhances Communication :-

- Good design presents information clearly.
- It reduces misunderstanding by using proper layout, colors, and symbols.

(V) Increases Engagement :-

- Users stay longer on well-designed websites or apps.
- Attractive design encourages people to interact more.

(VI) Supports Branding :-

- Unique and consistent design reflects the identity of a brand.
- It helps customers remember & recognize the product or company.

(VII) Boosts Sales & Growth :-

- appealing design influences customer decisions.
- It helps in increasing sales, popularity, & long-term growth.

(VIII) Saves Time & Effort :-

- Clear design avoids confusion for users.
- It reduces the need for extra instructions or support.

3. Give a brief history of Human Computer Interface.

Explain briefly how GUI evolved.

Ans:- History of Human Computer Interface :-

(I) Early Human Communication :-

- The lowest and most common level of communication mode we share are movements and gestures.
- These are the language independent and it can be understood by anyone what the other one want to tell.

(II) Spoken Language :-

- The next higher level, in terms of universality, is Spoken language.
- A spoken language is a very efficient mode of communication if each other understand it.

(III) Written Language :-

- Writing is more complex than speaking, while most people speak, not all can write.
- Writing is slower, compared to speech.

(IV) Typewriter :-

- The typewriter added another step in communication.
- Skilled typists could type faster than handwriting.
- But speaking still remained more efficient than writing.

(V) Early Computers :-

- computers required rigid typed input through keyboard.

- Users found it slow & sometimes difficult.
- common interaction styles were :-
 - command language, Questions & answer, Menu Selection
 - function key selection, form fill-in

Evolution of GUI

- (i) Before GUI, the computers only had the text-based interfaces, where users typed commands to operate the systems.
- (ii) Beginning of GUI :-
 - In the 1970s, Xerox Alto introduced the idea of GUI with icons, windows and a mouse pointer.
 - This made computers easier for ordinary people to use.
- (iii) Spread of GUI :-
 - In 1984, Apple Macintosh made GUI popular in PC.
 - later, Microsoft Windows (1985 onwards) brought GUI to millions of users worldwide.
- (iv) Modern GUI :-
 - Today, GUI has advanced with touchscreens, drag & drop, gestures and voice input.
 - It makes interaction more visual, natural & user-friendly.

- i. HCI is a multi-disciplinary subject. Illustrate the statement with proper example in different subjects?

Ans- HCI is multi-disciplinary because it combines technology, psychology, design, engineering, social sciences to create systems that are both powerful and easy for people to use.

- It takes knowledge from many different fields to design effective and user-friendly systems.

Computer Science :-

- It provides the technical foundations for building the software and hardware.
- ex:- programming languages & OS that supports GUI.

(IV) Psycho psychology :-

- It studies how human think, perceive, and react while using computers.
- ex:- It helps in understanding memory load while designing menus and navigation.

(V) Design :-

- Focuses on visual design, colors, icons and layout for better user experience.
- ex:- Creating clear & attractive icons in a Smartphone interface.

(VI) Engineering :-

- Deals with hardware design to make devices comfortable and efficient.
- ex:- Designing a keyboard or mouse that reduces strain & increases speed.

(VII) Social Science :-

- Studies how technology affects society & human behaviour.
- ex:- Researching how people use social media platforms in daily life.

(VIII) Education :-

- Uses HCI to make learning interactive & effective.
- ex:- E-learning platforms with animations, quizzes, & user-friendly navigations.

(IX) Communication & Linguistics :-

- It is important for developing speech recognition & natural language interfaces.
- ex:- Chatbots, Siri, Alexa, Google Assistant.

Q. What do you mean by Direct Manipulation Systems? What are their characteristics? Explain with the proper illustration of real-life applications.

Ans - Direct Manipulation Systems :-

- Direct Manipulation Systems are the interfaces where users interact directly with objects on the screen.

- rather than typing commands.
- The system gives immediate visual feedback to the user's actions.
 - em - moving a file by drag and drop instead of typing a copy command.

Characteristics :-

- I) objects are visible - Users can see files, icons or items on the screen.
- II) Physical actions - Users can click, drag or touch instead of typing commands.
- III) Immediate feedback - The system shows results right away.
- IV) easy to undo - mistakes can be corrected quickly (undo / redo).
- V) Step-by-step - Users can make small changes and see them instantly.

Real life Applications :-

- I) Desktop interface :- Icons, folders and drag-and-drop features in windows or macOS.
- II) Touchscreen Smartphones :- Pinch-to-zoom in photos, swipe to unlock, or drag apps on the home screen.
- III) Graphic Design software :- Drawing directly on canvas, resizing shapes, or moving objects visually.
- IV) Video games :- players interact with objects by directly controlling characters or dragging items in the game.
- V) ATM Machines :- users press buttons or touch icons directly instead of typing codes.

5. Analyze and explain the characteristics of graphical user interfaces? Explain each point briefly. What are the psychological responses to poor design from user?

Ans - Characteristics of Graphical User Interface (GUI) :-

- I) Icons and symbols :-
 - Objects and functions are represented by small pictures
 - ex - A trash bin icon for delete, or a folder icon for storage.
- II) Menus and Toolbars :-
 - Options are organized in menus or toolbars for easy access.

7) en: File → Save or clicking the Save button in word.

III) Visualization :-

- A GUI helps people understand large or complex data through charts, graphs and images.
- This makes learning easier, decisions faster, work more accurate.

IV) concurrent performance :-

- A GUI allows users to do multiple tasks at the same time.

→ ex - You can type a document while listening to music.

V) Use of Recognition memory :-

- A GUI keeps objects and actions visible on the screen. So users recognize options instead of remembering them.
- This makes it easier to use & avoid confusion.

Psychological Responses to poor Design from Users :-

- I) confusion - Users feel lost when the design is not clear or -
- II) Frustration - Tasks become irritating and difficult.
- III) stress - Cluttered design increases mental pressure.
- IV) Loss of confidence - Users doubt their abilities.
- V) Low productivity - Work becomes slower and tiring.
- VI) Errors - Mistakes happen due to unclear instructions.
- VII) Negative Attitude - Users may dislike or avoid the system.
- VIII) Reduced Satisfaction - Users feel unhappy and distrust the product.

6. What are the some of the common usability problems in Graphical Systems? Explain at least 10 problems.

Ans - Common usability problems in Graphical Systems :-

i) Too many options on Screen :-

→ when too many buttons or menus are shown on the screen, users get confused and cannot easily find what they need.

→ ex - A mobile app home screen filled with too many

buttons makes it hard to locate the right option.

ii) Difficult navigation :-

- If menus & buttons are not arranged in a proper order, user may get lost while trying to move through the system.
- ex - Settings that are hidden deep inside multiple menus make it difficult for the users to access them quickly.

iii) Different styles in different places :-

- When different screens use different styles, users cannot predict how things will look.
- ex - 'OK' button on the left in one window & on the right in another.

iv) Confusing symbols :-

- When icons or symbols without clear meaning force users to guess their function.
- ex - A Star icon is unclear, it means "favourite" or "rate".

v) Bad error messages :-

- Technical error messages do not help users to understand the problem.
- ex - Website showing only "404" error.

vi) System is slow :-

- If the system responds slowly, users become frustrated & impatient.
- ex - An app that takes a long time to open.

vii) No confirmation or feedback :-

- When the system does not show that an action has been completed, users may repeat the same action.
- ex - Sending a message but no "tick" shown.

viii) Too many pop-ups or effects :-

- Excessive pop-ups or animations distract users & waste their time.
- ex - A game showing ads again and again.

- ix) Not user-friendly for everyone :-
- Designs that use small text, low contrast, or tiny buttons are difficult for many users to operate.
 - ex - website text too small to read.

- x) Important functions hidden :-
- when key options are buried inside menus, users struggle to find them.
 - ex - Logout button hidden in menus.

Q. what are the important Human characteristics that need to be considered when designing interface and screens? Explain briefly each characteristic.

Ans:- Important Human characteristics in Interface and Screen Design :-

when designing interfaces and Screens, it is important to consider the following human characteristics.

- Perception :-
 - use clear visuals.
 - provide proper color contrast
 - keep layouts simple and easy to follow.
- Memory :-
 - Human memory is limited.
 - use menus and icons to reduce memory load.
 - provide cues instead of requiring recall.
- Mental models :-
 - Match design with real-world concepts.
 - ex - Trash bin icon for delete.
 - Help users predict system behavior.
- Movement control :-
 - Buttons and controls should be large.
 - Ensure easy use with mouse, keyboard, or touch
 - Minimize unnecessary movements.

- v) Learning :-
 - Interfaces should be easy to learn.
 - Use simple, consistent layouts.
 - Provide clear instructions and guidance.
- vi) Skill :-
 - Users improve with practice.
 - Allow shortcuts for experienced users.
 - Support efficient performance.
- vii) Attention :-
 - Highlight important items.
 - Avoid unnecessary distractions.
 - Use focus indicators when needed.
- viii) Individual Differences :-
 - Consider user age & culture.
 - Adapt for different abilities (vision, skills).
 - Provide accessibility options.
- ix) Knowledge & experience :-
 - Support beginners with help and tips.
 - Provide advanced features for experts.
 - Allow flexibility for different skill levels.

8. What is the Human interaction speeds regarding the various communication methods? Which method of communication is the fastest and which is the slowest? Which communication methods are most used by Computer Systems?

- Ans - Human Interaction Speeds & Communication Methods:
- i) Reading :-
 - Humans can read about 250-300 words per minute.
 - Reading is fast because the brain quickly recognizes words and processes meaning.
 - Most computer systems use reading as the main way to present information to users.

II) Writing :-

- Handwriting speed is 20-30 words per minute.
- Typing speed :- 40-60 words per minute on average.
- Writing is slow because it requires physical effort and careful input.

III) Speaking :-

- Average speaking speed is 100-150 words per minute.
- Faster than writing because no hand movements are needed.
- It is used when interacting with voice assistant or in verbal communication.

IV) Listening :-

- Humans can understand speech at 150-200 words per minute.
- Slightly faster than speaking in comprehension but depends on clarity & attention.

Fastest & Slowest communication methods :-

- I) Fastest : Reading is the fastest communication method, because information can be processed quickly by the brain.
- II) Slowest : writing is the slowest communication method because it requires more time and efforts.

Communication Methods most used by computers :-

- I) Reading - users can read information on screens such as texts, menus or instructions.
- II) Typing / keyboard i/p :- users type commands, fill forms, or enter data.
- III) clicking / Touch i/p / Pointing :- common in graphical systems to select options or interact with the objects.
- IV) computers use speaking & listening unless voice recognition or audio output is implemented.

q. What do you mean by Business functions? Explain the different techniques for determining requirements?

Ans- Business Function :- These are the activities or operations performed within an organization to achieve its goals & objectives.

Techniques for determining the requirements :-

- (i) Interviews :- Talk to stakeholders or users to gather needs.
→ ex - Ask managers what reports they need.
 - (ii) Surveys :- collect information from many users by asking questions. ex - Employee survey about the system features.
 - (iii) Observations :- Watch users perform tasks to identify the problems. ex - Observe how orders are processed
 - (iv) Document Analysis :- Review existing forms, reports or procedures. ex - Study past customer records.
 - (v) Workshops :- Group sessions to gather requirements collaboratively. ex :- Workshop to define features of a new HR system.
 - (vi) Prototyping :- Create a small model to clarify requirements and get feedback. ex :- Sample interface for processing order.
10. What do you understand by visually pleasing the composition? What are the different qualities that determine this? With the help of neat diagrams explain each quality?

Ans- Visually pleasing composition :-

- It is an arrangement of visual elements (like shapes, colors, text, and images) in a way that is attractive, balanced, and harmonious to the viewer's eye.
- It ensures that the viewer's attention is guided smoothly and the design communicates its message effectively.

Qualities that determine a visually pleasing composition.

- 1) Balance :- It refers to the distribution of visual weight in a composition.

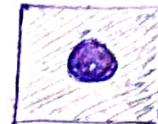
Types of balances :-

- (a) Symmetrical balance :- Equal elements on both sides of central axis.
- (b) Asymmetrical balance: Unequal elements that still feel balanced.

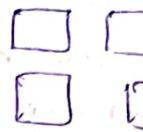


- ii) Contrast :- Difference between elements to make certain areas stand out.

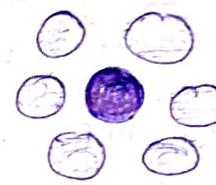
ex:- Light vs dark, big vs small,
Smooth vs Rough



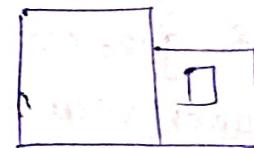
- iii) Unity / Harmony :- How well elements work together to create a cohesive whole.



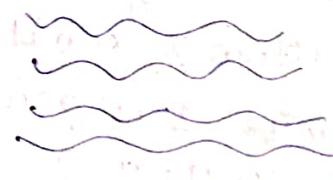
- iv) Emphasis / Focal point :- The part of the composition that draws attention first.



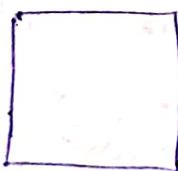
- v) Proportion :- The size relationship between the elements.



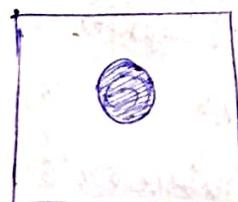
- vi) Rhythm / Repetition :- Repeating elements to create a flow or pattern.



- vii) White space / Negative space :- Empty spaces that prevent clutter and enhance readability.



white space



white space

Negative space