MODULE 1 QB

-PP

1) Define User Interface. Write in brief about the need for human computer interface / Write in brief the importance of Good Design.

Ans)

- User interface design is a subset of a field of study called human-computer interaction.
- Human-computer interaction is the study, planning and design of how people and computers work together so that a person's needs are satisfied in the most effective way.
- The user interface has two components: input and output.

Importance of Good Design:

- Inspite of today's rich technologies and tools we are unable to provide effective and usable screen because of lack of time and care.
- A well-designed interface and screen is terribly important to our users.
- It is their window to view the capabilities of the system.
- It is the vehicle through which complex tasks can be performed.
- A screen's layout and appearance affect a person in a variety of ways.
- If the screen layout is confusing and inefficient, people will have greater difficulty in doing their jobs and will make more mistakes.
- Poor design may even chase some people away from a system permanently.
- It can also lead to aggravation, frustration and increased stress.

2) Write the benefits of good design.

Ans)

Benefits of Good Design:

- The benefits of a well-designed screen have been under experimental study for many years.
- One researcher, for example, attempted to improve screen clarity and readability by making screens less crowded.
- The result: screen users of the modified screens completed transactions in 25% less time and with 25% fewer errors than those who used the original screens.
- Another researcher has reported that following good design principles reduced decision-making time by about 40%.
- Other benefits also come from good design (Karat, 1997).
- Training costs are lowered because training time is reduced.
- Support line costs are lowered because fewer assist calls are necessary.
- Employee satisfaction is increased because aggravation and frustration are reduced.
- Another benefit is the organization's customers benefit because of the improved service they receive.
- Identifying and resolving problems during the design and development process also has significant economic benefits.

3) Explain the advantages and disadvantages of GUI.

Ans)

Advantages:

1) Symbols recognized faster than text:

- Symbols can be recognized faster and more accurately than text.
- Icons speeds up the recognition.
- These icons allow speedy recognition of the type of message being presented.

2) Faster learning:

- A graphical, pictorial representation aids learning and symbols can also be easily learned.

3) Faster use and problem solving:

- Visual or spatial representation of information has been found to be easier to retain and manipulate.
- It leads to faster and more successful problem solving.

4) Easier remembering:

- Because of greater simplicity, it is easier for casual users to retain operational concepts.

5) More natural:

- Symbolic displays are more natural and advantageous because the human mind has a powerful image memory.

6) Fewer errors:

- Reversibility of actions reduces error rates because it is always possible to undo the last step.
- Error messages are less frequently needed.

7) Increased feeling of control:

- The user initiates actions and feels in control.
- This increases user confidence.

8) Immediate feedback:

- The results of actions furthering user goals can be seen immediately.
- If the response is not in the desired direction, the direction can be changed quickly.

9) Predictable system responses:

- Predictable system responses also speed learning.

10) Easily reversible actions:

- This ability to reverse unwanted actions also increases user confidence.

11) More attractive:

- Direct-manipulation systems are more entertaining, cleverer and more appealing.

12) May consume less space:

- Icons may take up less space than the equivalent in words but this is not the case always.

13) Replaces national languages:

- Icons possess much more universality than text and are much more easily comprehended worldwide.

14) Easily augmented with text displays:

- Where graphical design limitations exist, direct-manipulation systems can easily be augmented with text displays.
- The reverse is not true.

15) Low typing requirements:

- Pointing and selection controls, such as the mouse or trackball, eliminate the need for typing skills.

Disadvantages:

1) Greater design complexity:

- Controls and basic alternatives must be chosen from a pile of choices numbering in excess of 50.
- This design potential may not necessarily result in better design unless proper controls and windows are selected.
- Poor design can undermine acceptance.

2) Learning still necessary:

- The first time one encounters many graphical systems, what to do is not immediately obvious.
- A severe learning and remembering requirement is imposed on many users because meanings of icons or using pointing device have to be learned.

3) Lack of experimentally-derived design guidelines:

- Today there is a lack of widely available experimentally-derived design guidelines.
- Earlier only few studies to aid in making design decisions were performed and available for today now.
- Consequently, there is too little understanding of how most design aspects relate to productivity and satisfaction.

4) Inconsistencies in technique and terminology:

- Many differences in technique, terminology, and look and feel exist among various graphical system providers and even among successive versions of the same system.
- So the user has to learn or relearn again while shifting to next terminology.

5) Not always familiar:

- Symbolic representations may not be as familiar as words or numbers.
- Numeric symbols elicit faster responses than graphic symbols in a visual search task.

6) Window manipulation requirements:

- Window handling and manipulation times are still excessive and repetitive.
- This wastes time.

7) Production limitations:

- The number of symbols that can be clearly produced using today's technology is still limited.
- A body of recognizable symbols must be produced that are equally legible and equally recognizable using differing technologies.
- This is extremely difficult today.

8) Few tested icons exist:

- Icons must be researched, designed, tested, and then introduced into the marketplace.
- The consequences of poor or improper design will be confusion and lower productivity for users.

9) Inefficient for touch typists:

- For an experienced touch typist, the keyboard is a very fast and powerful device.

10) Not always the preferred style of interaction:

- Not all users prefer a pure iconic interface.
- User will also prefer alternatives with textual captions.

11) Not always fastest style of interaction:

- Graphic instructions on an automated bank teller machine were inferior to textual instructions.

12) May consume more screen space:

- Not all applications will consume less screen space.
- A listing of names and telephone numbers in a textual format will be more efficient to scan than a card file.

13) Hardware limitations:

- Good design also requires hardware of adequate power, processing speed, screen resolution and graphic capability.

(Learn atleast 10-12 advantages and disadvantages)

4) Elaborate the general principles of User Interface Design.

OR

Explain the characteristics and principles of UID.

Ans)

1. Aesthetically Pleasing:

Provide visual appeal by following these presentation and graphic design principles:

- Provide meaningful contrast between screen elements.
- Create groupings.
- Align screen elements and groups.
- Provide three-dimensional representation.
- Use color and graphics effectively and simply.

2. Clarity:

The interface should be visually, conceptually and linguistically clear, including:

- Visual elements
- Functions
- Metaphors
- Words and text

3. Compatibility:

- Provide compatibility with the following:
  - The user
  - The task and job
  - The product
- Adopt the user's perspective.

4. Comprehensibility:

A system should be easily learned and understood. A user should know the following:

- What to look at
- What to do
- When to do it
- Where to do it
- Why to do it
- How to do it

5. Configurability:

Permit easy personalization, configuration, and reconfiguration of settings.

- Enhances a sense of control.
- Encourages an active role in understanding.

6. Consistency:

- A system should look, act, and operate the same throughout. Similar components should:
  - Have a similar look.
  - Have similar uses.
  - Operate similarly.
- The same action should always yield the same result.
- The function of elements should not change.
- The position of standard elements should not change.

7. Directness:

Provide direct ways to accomplish tasks.

- Available alternatives should be visible.
- The effect of actions on objects should be visible.

8. Efficiency:

- Minimize eye and hand movements, and other control actions.
  - Transitions between various system controls should flow easily and freely.
  - Navigation paths should be as short as possible.
  - Eye movement through a screen should be obvious and sequential.
- Anticipate the user's wants and needs whenever possible.

9. Familiarity:

- Employ familiar concepts and use a language that is familiar to the user.
- Keep the interface natural, mimicking the user's behavior patterns.
- Use real-world metaphors.

10. Flexibility:

A system must be sensitive to the differing needs of its users, enabling a level and type of performance based upon:

- Each user's knowledge and skills.
- Each user's experience.
- Each user's personal preference.
- Each user's habits.
- The conditions at that moment.

11. Forgiveness:

- Tolerate and forgive common and unavoidable human errors.
- Prevent errors from occurring whenever possible.
- Protect against possible catastrophic errors.
- When an error does occur, provide constructive messages.

12. Predictability:

- The user should be able to anticipate the natural progression of each task.
  - Provide distinct and recognizable screen elements.
  - Provide cues to the result of an action to be performed.
- All expectations should be fulfilled uniformly and completely.

13. Recovery:

- A system should permit:
- Commands or actions to be abolished or reversed.

- Immediate return to a certain point if difficulties arise.
- Ensure that users never lose their work as a result of:
  - An error on their part.
  - Hardware, software, or communication problems.

14. Responsiveness:

- The system must rapidly respond to the user's requests.
- Provide immediate acknowledgment for all user actions:
  - Visual.
  - Textual.
  - Auditory.

15. Simplicity:

- Provide as simple an interface as possible.
- Five ways to provide simplicity:
  - Use progressive disclosure, hiding things until they are needed.
- Present common and necessary functions first.
- Prominently feature important functions.
- Hide more sophisticated and less frequently used functions.
  - Provide defaults.
  - Minimize screen alignment points.
  - Make common actions simple at the expense of uncommon actions being made harder.
  - Provide uniformity and consistency.

16. Transparency:

Permit the user to focus on the task or job, without concern for the mechanics of the interface.

- Workings and reminders of workings inside the computer should be invisible to the user.

17. Trade-Offs:

- Final design will be based on a series of trade-offs balancing often-conflicting design principles.
- People's requirements always take precedence over technical requirements.

(Learn atleast 12 to 15 points)

5) Explain the characteristics of graphical user interface.

Ans)

1) Sophisticated Visual Presentation:

- It is the visual aspect of the interface and what people see on the screen.
- It permits displaying lines, including drawings and icons.
- It also permits the displaying of a variety of character fonts, including different sizes and styles.
- The objective is to reflect visually on the screen the real world of the user as realistic, meaningful, simple and as clear as possible.

2) Pick-and-Click Interaction:

- Elements of a graphical screen upon which some action is to be performed must first be identified.
- The primary mechanism for performing this pick-and-click is most often the mouse and its buttons.
- The secondary mechanism for performing these selection actions is the keyboard.

3) Restricted Set of Interface Options:

- The array of alternatives available to the user is what is presented on the screen or what may be retrieved through what is presented on the screen, nothing less, nothing more.
- This concept fostered the acronym WYSIWYG.

4) Visualization:

- It is a cognitive process that allows people to understand information that is difficult to perceive, because it is either too voluminous or too abstract.
- Presenting specialized graphic portrayals facilitates visualization.
- The best visualization method for an activity depends on what people are trying to learn from the data.

5) Object Orientation:

- A graphical system consists of objects and actions.
- Objects are what people see on the screen.
- They are manipulated as a single unit.
- A well-designed system keeps users focused on objects, not on how to carry out actions.
- Objects can be composed of sub-objects.

6) Use of Recognition Memory:

- Continuous visibility of objects and actions encourages to eliminate - out of sight, out of mind problem.

7) Concurrent Performance of Functions:

- Graphic systems may do two or more things at one time.
- Multiple programs may run simultaneously.
- It may process background tasks.
- Data may also be transferred between programs.
- Data may be temporarily stored on a clipboard.

6) Differentiate between GUI and Web Interface.

Ans)

GUI	Web Interface
1) Screen appears exactly as specified.	1) Screen appearance influenced by hardware being used.
2) User focuses on Data and Applications.	2) User focuses on Information and Navigation.
3) Typically created and used by known and trusted sources	3) Full of unknown content. Source not always trusted
4) Controlled and constrained by program.	4) Infinite and generally unorganized.
5) Contains - Windows, menus, controls, data, toolbars, messages, and so on.	5) Contains two components - browser and page.
6) Navigation through menus, lists, trees, dialogs, and wizards.	6) Navigation through links, bookmarks, and typed URLs.
7) User tasks - Install, configure, personalize, start, open, use and close data files.	7) User tasks - Link to a site, browse or read pages, fill out forms, upgrade programs.
8) Response Time is nearly instantaneous.	8) Response Time is quite variable, depends on few factors.
9) Targeted to a specific audience with specific tasks.	9) Often intended for anyone and everyone.
10) Little significant personalization.	10) Limited personalization available.

11) Typically placed into system by users or known people and organizations.	11) Often not placed onto the Web by users or known people and organizations.
12) Presented as specified by designer.	12) May not be presented as specified by designer.
13) Typically prescribed and constrained by toolkit.	13) Encourages a more artistic, individual and unrestricted presentation style.
14) Personal support desk is usually provided.	14) Customer service support is usually provided.

7) Define GUI. Give example.

Ans) GUI means the user can interact with the visual representations on digital control panels.
Ex: Tablets, smartphones, gaming systems.

8) Discuss the direct & indirect manipulation graphical system with examples.
Ans)

Direct Manipulation:

They possess the following characteristics:

The system is portrayed as an extension of the real world:

- A person is allowed to work in a familiar environment and in a familiar way, focusing on the data, not the application and tools.
- The physical organization of the system, which most often is unfamiliar, is hidden from view and is not a distraction.

Continuous visibility of objects and actions:

- Objects are continuously visible.
- There are reminders of actions to be performed.

Actions are rapid and incremental with visible display of results:

- The results of actions are immediately displayed visually on the screen in their new and current form.
- Auditory feedback may also be provided.
- The impact of a previous action is quickly seen, and the evolution of tasks is continuous and effortless.

Incremental actions are easily reversible:

- Finally, actions, if discovered to be incorrect or not desired, can be easily undone.

Indirect Manipulation:

- In practice, direct manipulation of all screen objects and actions may not be feasible because of the following:
  - The operation may be difficult to conceptualize in the graphical system.
  - The graphics capability of the system may be limited.
  - The amount of space available for placing manipulation controls in the window border may be limited.
  - It may be difficult for people to learn and remember all the necessary operations and actions.
- When this occurs, indirect manipulation is provided.
- Indirect manipulation substitutes words and text, such as pull-down or pop-up menus, for symbols and substitutes typing for pointing.

9) Explain Application versus Object/Data Orientation.

Ans)

An application-oriented action: object approach does this:
Action> 1. An application is opened (for example, word processing).
Object> 2. A file or other object selected (for example, a memo).

An object-oriented object: action approach does this:
Object> 1. An object is chosen (a memo).
Action> 2. An application is selected (word processing).

10) Differentiate between Internet and Intranet.

Ans)

Internet	Intranet
1) Connects different networks of computers simultaneously.	1) It is owned by private firms.
2) There are multiple users.	2) There are limited users.
3) It is unsafe.	3) It is safe.
4) There are more number of visitors.	4) There are less number of visitors.
5) It is public network.	5) It is private network.
6) Anyone can access it.	6) Anyone cannot access it.
7) Provides unlimited information.	7) Provides limited information.
8) It includes several intranets.	8) It is like a subset of internet.

MODULE 2 QB

-PP

1) State the obstacles and pitfalls faced in UID?

Ans)

- The development path of a computer system is littered with obstacles and traps, many of them human in nature.
- Gould (1988) has made these general observations about design:
  - Nobody ever gets it right the first time.
  - Development is chock-full of surprises.
  - Good design requires living in a sea of changes.
  - Making contracts to ignore change will never eliminate the need for change.
  - Even if you have made the best system humanly possible, people will still make mistakes when using it.
  - Designers need good tools.

- The first five conditions listed will occur naturally because people are people, both as users and as developers.
- User mistakes that always occur can be reduced.
- Pitfalls in the design process exist because of a flawed design process.
- Common pitfalls are:

  1) No early analysis and understanding of the user's needs and expectations.

  2) A focus on using design features or components that are "neat" or "glitzy."

  3) Little or no creation of design element prototypes.

  4) No usability testing.

  5) Poor communication between members of the development team.

2) How obstacles and pitfalls faced in UID can be eliminated by the designers?

OR

Explain the five commandments in designing for the people.

Ans)

1) Gain a complete understanding of users and their tasks:

- The users are the customers.
- Today, people expect a level of design sophistication from all interfaces, including Web sites.
- The product must be geared to people's needs, not those of the developers.
- A wide gap in technical abilities, goals, and attitudes often exists between users and developers.

2) Solicit early and ongoing user involvement:

- Involving the users in design from the beginning provides us knowledge about their jobs, tasks, and needs.
- People dislike change for a variety of reasons like fear of the unknown and lack of identification with the system.
- User involvement should be based on job or task knowledge, not status or position.
- The boss seldom knows what is really happening out in the office.

3) Perform rapid prototyping and testing:

- Prototyping and testing the product will quickly identify problems and allow you to develop solutions.
- Prototyping and testing must be continually performed during all stages of development.
- Encountering a series of problems early in system use will create a negative first impression in the customer's mind.
- It is also much harder and costlier to fix a product after its release.

4) Modify and iterate the design as much as necessary:

- Design proceeds through a series of stages.
- Problems detected in one stage may force the developer to revisit a previous stage.
- This is normal and should be expected.
- Continuous testing and modifying should be done until all design goals are met.

5) Integrate the design of all the system components:

- The software, the documentation, the help function and training needs are all important elements of a graphical system.
- A system is being constructed, not simply a software.
- All the possible problems earlier in the design must be addressed more effectively.

3) List the common usability problems.

Ans)

Common Usability problems:

1. Ambiguous menus and icons.
2. Languages that permit only single-direction movement through a system.
3. Input and direct manipulation limits.
4. Highlighting and selection limitations.
5. Unclear step sequences.
6. More steps to manage the interface than to perform tasks.
7. Complex linkage between and within applications.
8. Inadequate feedback and confirmation.
9. Lack of system anticipation and intelligence.
10. Inadequate error messages, help, tutorials and documentation

4) Explain the Web usability problems.

Ans)

1) Visual clutter:

- A lack of "white space," meaningless graphics, and unnecessary and wasteful decoration often turn pages into jungles of visual noise.
- Useless displayed elements are actually a form of visual noise.

2) Impaired information readability:

- Page readability is diminished by poor developer choices in colors and graphics.
- A person's attention is directed towards trying to understand why the differences exist, instead of being focused toward identifying and understanding the page's content.
- Backgrounds that are brightly colored or contain pictures or patterns greatly reduce the importance of the overwritten text.

3) Incomprehensible components:

- Some design elements do not give the user any clue about their function.
- Some icons and graphics do not contain text to explain what they do.
- Command buttons or areas that are clickable often won't be clicked.
- Language is also often confusing, with the developer's terminology being used, not that of the user.

4) Annoying distractions:

- Elements constantly in motion, scrolling marquees or text, blinking text, or looping continually running animations compete with meaningful content for the user's eye's and attention and destroy a page's readability.
- Automatically presented music or other sounds interrupt one's concentration.
- Non-requested pop-up widows must be removed. That wastes more of the user's time.

5) Confusing navigation:

- Poor, little or no organization exists among pages.
- The size and depth of many Web sites can eventually lead to a "lost in space" feeling as perceived site structure evaporates as one navigates.
- Navigation links lead to dead-ends from which there is no return, or boomerang you right back to the spot where you are standing without you being aware of it.
- Some navigation elements are invisible.
- Confusing navigation violates expectations and results in disturbing unexpected behavior.

6) Inefficient navigation:

- A person must transverse content-free pages to find what is meaningful.
- Large graphics waste screen space and add to the page count.
- The path through the navigation maze is often long and tedious.
- Massive use of short pages with little content often creates the feeling that one is "link drunk."

7) Inefficient operations:

- Time is wasted doing many things.
- Page download times can be excessive.
- Pages that contain, for example, large graphics and maps, large chunky headings, or many colors, take longer to download than text.

8) Excessive or inefficient page scrolling:

- Long pages requiring scrolling frequently lead to the user's losing context as related information's spatial proximity increases and some information entirely disappears from view and, therefore, from memory.
- Out of sight is often out of mind.
- If navigation elements and important content are hidden below the page top, they may be missed entirely.
- To scroll to do something important or complete a task can be very annoying.

9) Information overload:

- Poorly organized or large amounts of information taxes one's memory and can be overwhelming.
- Heavy mental loads can result from making decisions concerning which links to follow and which to abandon, given the large number of choices available.
- One easily becomes buried in decisions and information.
- Requiring even minimal amounts of learning to use a Web site adds to the mental load.

10) Design inconsistency:

- The business system user may visit a handful of systems in one day, the Web user may visit dozens, or many more.
- It is expected that site differences will and must exist because each Web site owner strives for its own identity.
- For the user's sake, some consistency must exist to permit a seamless flow between sites.
- When users are forced to remember different color meanings in different places, it causes confusion between links and underlined text.
- The Web is a form of the graphical user interface, and GUI guidelines should be followed.

11) Outdated information:

- A Web site should be "current."
- Outdated information destroys a site's credibility in the minds of many users.
- If that happens then useless site is not very usable.

12) Stale design caused by emulation of printed documents and past systems:

- The Web is a new medium with expanded user interaction and information display possibilities.
- Websites should be rethought and redesigned using the most appropriate and robust design techniques available.
- Developers often have created a product to please themselves and "look cool," not to please their users.

5) Mention the importance of usability with its measures.

Ans)

Importance of Usability:

- It supports users in completing actions accurately.
- It is more efficient.
- It makes users to use pleasantly.
- It supports a range of user actions and only shows an error in genuine erroneous situations.
- It makes new users accomplish goals easily.

Some Practical Measures of Usability:

- Are people asking a lot of questions or often reaching for a manual?
- Are frequent exasperation responses heard?
- Are there many irrelevant actions being performed?
- Are there many things to ignore?
- Do a number of people want to use the product?

Some Objective Measures of Usability:

- How effective is the interface?
- How learnable is the interface?
- How flexible is the interface?

6) Discuss the impact of human characteristics in design.

Ans)

1) Perception

- Perception is our awareness and understanding of the elements and objects of our environment through the physical sensation of our various senses, including sight, sound, smell and so forth.
- Perception is influenced partly by experience.
- Other perceptual characteristics include the following:

a) Proximity
b) Similarity
c) Matching patterns
d) Succinctness
e) Closure
f) Contest
f) Unity
g) Continuity
h) Balance
i) Expectancy
k) Signals versus noise

2) Memory:

- Memory is viewed as consisting of two components: long-term and short-term memory.
- Short-term memory receives information from either the senses or long-term memory.
- Long-term memory contains the knowledge we possess.

3) Sensory Storage:

- Sensory storage is the buffer where the automatic processing of information collected from our senses takes place.
- It constantly scans the environment for things that are important to pass on to higher memory.
- Design the interface so that all aspects and elements serve a definite purpose.

4) Visual Acuity:

- Capacity of the eye to resolve details is called visual acuity.
- Phenomenon that results in an object becoming more distinct as we turn our eyes towards it and rapidly losing distinctness as we turn our eyes away from it.

5) Foveal and Peripheral Vision:

- Foveal vision is used to focus directly on something.
- Peripheral vision senses anything in the area surrounding the location we are looking at, but what is there cannot be clearly resolved because of the limitations in visual acuity.

6) Information Processing:

- The information that our senses collect has to be processed in some meaningful way.
- There are two levels - High level and Low level.
- Higher level performs reasoning and problem solving.
- Lower level perceives the physical form of information sensed.

7) Mental Models:

- A mental model is an internal representation of a person's current understanding of something.
- The key to forming this is design consistency and design standards.

8) Movement Control:

- Once data has been perceived and an appropriate action decided upon, a response must be made.
- In many cases the response is a movement.

- Big buttons are better than small buttons. They provide a larger target for the user to access with the screen pointer.

9) Learning:

- Learning is the process of encoding in long-term memory information that is contained in short-term memory.
- Our ability to learn clearly differentiates people from machines.

10) Skill:

- Goal of human performance is to perform skillfully.
- It requires linking inputs and responses into a sequence of action.
- System and screen design must permit development of increasingly skillful performance.

11) Individual Differences:

- An advantageous human characteristic is that we all differ in looks, feelings, motor abilities, intellectual abilities, learning abilities and speed, and so on.
- Design must provide for the needs of all potential users.

7) Explain briefly about human interaction speeds.

Ans)

Reading:

Prose text:	250–300 words per minute.
Proof reading text on paper:	200 words per minute.
Proof reading text on a monitor:	180 words per minute.
Listening:	150–160 words per minute.
Speaking to a computer:	105 words per minute.
After recognition corrections:	25 words per minute.

Keying Typewriter:

Fast typist:	150 words per minute and higher.
Average typist:	60–70 words per minute.

Computer:

Transcription:	33 words per minute.
Composition:	19 words per minute.

Two finger typists:

Memorized text: 37 words per minute.

Copying text: 27 words per minute.

Hand printing:

Memorized text: 31 words per minute.

Copying text: 22 words per minute.

8) Explain the techniques for determining the user requirements using Direct Method.

Ans)

1. Individual Face-to-Face Interview:

- A one-on-one visit is held with the user.
- It may be structured or somewhat open-ended.
- Formal questionnaire should not be used.

2. Telephone Interview or Survey:

- Interview conducted using the telephone.
- It must be structured and well planned.
- Telephone interviews are less expensive than personal interviews.

3. Traditional Focus Group:

- Small group of users (8 to 12) and a moderator brought together to discuss the requirements.
- Session lasts for about two hours.
- Purpose - Understand user's experiences, attitudes, beliefs and desires and obtain their reactions to ideas.

4. Facilitated Team Workshop:

- Similar in structure and content to a traditional focus group.
- Less formal.

5. Observational Field Study:

- Users are observed and monitored for an extended time to learn what they do.
- It can be time-consuming and expensive.

6. Requirements Prototyping:

- A demo, or very early prototype, is presented to users for comments concerning functionality.

7. User-Interface Prototyping:

- A demo, or early prototype, is presented to users to understand user-interface issues and problems.

8. Usability Laboratory Testing:

- Users at work are observed, evaluated and measured in a specially constructed laboratory.
- Usability tests discovers what people actually do.

9. Card Sorting for Web Sites:

- A technique to establish groupings of information for Web sites.

9) Explain the guidelines for designing conceptual model.

Ans)

1) Reflect the user's mental model, not the designer's:

- A user will have different expectations and levels of knowledge than the designer.
- The user is concerned with the task to be performed, the business objectives that must be fulfilled.

2) Draw physical analogies or present metaphors:

- Replicate what is familiar and well known.
- A metaphor must be widely applicable within an interface, to be effective.

3) Comply with expectancies, habits, routines and stereotypes:

- Use familiar associations, avoiding the new and unfamiliar.
- Use words and symbols in their customary ways.

4) Provide action-response compatibility:

- All system responses should be compatible with the actions that elicit them.
- For example, Names of commands should reflect the actions that will occur.

5) Make invisible parts and process of a system visible:

- New users of a system often make erroneous or incomplete assumptions about what is invisible and develop a faulty mental model.
- As more experience is gained, their mental models evolve to become more accurate and complete.

6) Provide proper and correct feedback:

- Be generous in providing feedback.
- Keep a person informed of what is happening, and what has happened, at all times.

7) Avoid anything unnecessary or irrelevant:

- Never display irrelevant information on the screen.
- People may try to interpret it and integrate it into their mental models, thereby creating a false one.

8) Provide design consistency:

- Design consistency reduces the number of concepts to be learned.
- If an occasional inconsistency cannot be avoided, explain it to the user.

9) Provide documentation and a help system that will reinforce the conceptual model:

- Do not rely on the people to uncover consistencies and metaphors themselves.
- The help system should offer advice to improve mental models.

10) Promote the development of both novice and expert mental models:

- Novices and experts are likely to bring to bear different mental models when using a system.

10) Write a note on guidelines that must be followed during detailed interface design that are valuable for users and developers.

Ans)

Valuable to users because they:

- Allow faster performance.
- Reduce errors.
- Reduce training time.
- Provides better system utilization.
- Improve satisfaction.
- Improve system acceptance.

Valuable to system developers because they:

- Increase visibility of the human-computer interface.
- Simplify design.
- Provide more programming and design aids.
- Reducing programming time.
- Reduce redundant effort.
- Reduce training time.
- Provide a benchmark for quality control testing.

11) Explain techniques for determining requirements using indirect method.

Ans)

1. MIS Intermediary:

- A company representative who defines the user's goals and needs to designers and developers.
- Too often this person does not have the breadth of knowledge needed to satisfy all design requirements.

2. Paper Survey or Questionnaire:

- A paper questionnaire given to a sample of users to obtain their needs.
- They may take a long time to collect and may be difficult to analyze.

3. Electronic Survey or Questionnaire:

- A questionnaire is given to a sample of users via e-mail or the Web.
- It is much faster than those distributed in a paper format.

4. Electronic Focus Group Similar:

- It is similar to a traditional focus group except but the discussion is accomplished electronically using specialized software on a workstation, e-mail or a Web site.

5. Marketing and Sales:

- Company representatives regularly meet customers, obtain their suggestions or needs.
- Business representatives have knowledge of the nature of customers, the business, and the needs that have to be met.

6. Support Line:

- Information collected by unit that helps customers with day-to-day problems.
- It is cheap.

7. E-Mail, Bulletin Boards or Guest Book:

- Problems, questions and suggestions by users posted to a bulletin board, a guest book, or through e-mail are gathered and evaluated.
- It is cheap.

8. User Group:

- User groups have the potential to provide a lot of good information, if organized properly.
- They require careful planning.

9. Competitor Analysis:

- Either designers can perform this evaluation or users can be asked to perform the evaluation.

10. Trade Show:

- Customers at a trade show can be exposed to a prototype and asked for comments.

11. Other Media Analysis:

- Analyze how other media, print or broadcast, presents the process, information, or subject matter of interest.

12. System Testing:

- New requirements and feedback can be accumulated, evaluated, and implemented as necessary

MODULE 3 QB

-PP

1) Explain the guidelines to be followed in phrasing menus during the development of system menus.

Ans) Following are guidelines to be followed in phrasing menus:

❖ **Main menu:**

- Menu title should immediately make the viewer understand the menu's content and purpose.
- Should be short, clear, distinctive and descriptive.
- Title should represent the entire series of choices.
- It is an important contextual and navigation component.

❖ **Submenus:**

- Submenu titles must be worded exactly the same way as the menu choice previously selected to display them.
- This will provide structural continuity.
- It assures users that they are progressing as expected through a menu hierarchy.

❖ **General:**

- Locate the title at the top of a listing of choices, in the title bar.
- Display title in uppercase or in a mixed-case font using the headline style of presentation.
- For headline style, capitalize the first letter of each significant title word.
- Case style chosen should be consistently used on all menus.
- Titles that add nothing to the understanding of menu content and context, may be omitted.
- Better to have a pop-up menu request during a text editing task.
- Message windows do not need a title either; the text of the message provides the context.

❖ **Menu Choice Descriptions:**

- Create meaningful choice descriptions that are familiar, fully spelled out and distinctive.
- Descriptions may be single words, compound words, or multiple words or phrases.
- Place the keyword first, usually a verb.
- Capitalize the first letter of each significant word in the choice description.
- Exception: Menu bar items should be a single word (if possible).

❖ **Menu Instructions:**

- Left-justify the instruction.
- Leave a space line, if possible, between the instructions.

❖ **Intent Indicators:**

- Provide an indication of what will happen when a menu item is selected to enhance predictability.
- Items causing a direct action will have no indicator.

❖ **Keyboard Equivalents:**

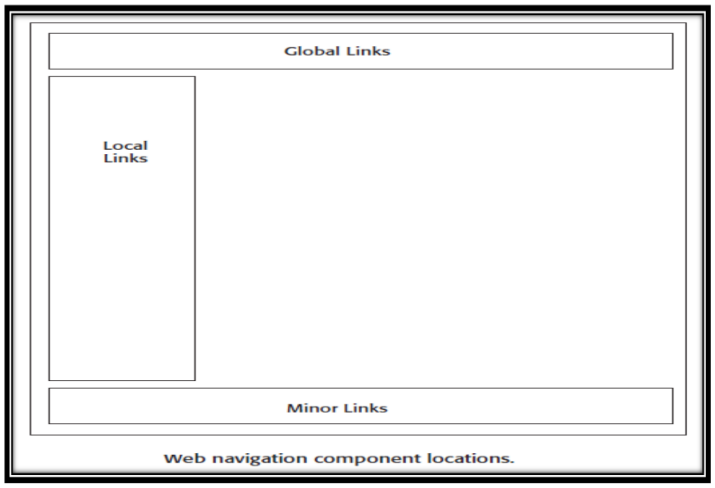
- Ability to select a menu alternative through the keyboard should always be provided.
- The mnemonic should be the first character of the menu item's description.

❖ **Keyboard Accelerators:**

- (Take few points from 7th Ans)

2) Explain the components of web navigation system with illustration.

Ans)



1. Browser Command Buttons:

- Provides navigation controls within the application for the movement within the application.
- They can take the form of links or command buttons such as Next and Previous.

2. Web Site Navigation Bars:

- Provides a global navigation bar at the top of each page.
- Provides a minor illustrative or footnote links at the end of the page.
- Consistency that reduces learning and avoids user confusion.
- For long pages, provide a navigation bar repeating important global or local links at the bottom of the page.

3. Textual Phrases:

- Textual phrases are words, or short pieces of highlighted text, serving as links.
- Textual phrase links possess two distinct structures - explicit and embedded.

4. Graphical Images or Icons:

- They may appear in an array in the form of a navigation bar or be individually located at relevant points in a page.

5. Command Buttons:

- They may appear in an array in the form of a navigation bar or be individually located at relevant points in a page.

6. Other Web Site Navigation Elements:

i) Overviews:

- It provides a top-level view of a site's organization and content.
- It will permit review of major topics and the subtopics within.

ii) Historical Trails:

- Provides information to user by showing them where they have come from, or where they have been.
- Displayed paths also provide a means to easily return to places of interest.

iii) Search Facility:

- Navigation support is provided within larger sites.

3) Explain the different elements of menu contents.

Ans) A menu consists of four elements, its context, its title, its choice descriptions and its completion instructions.

1. Menu Context:

- Provides information to keep the user oriented.
- Feedback necessary that tells users where they are in a process, what their past choices were and possibly how much farther they still have to navigate.
- Verbal linkage, spatial linkage, or both may be used to provide navigation feedback.
- Verbal linkage - involves providing a listing of choices made on previous menus that have led to this position.
- Spatial linkage - can be accomplished by graphic methods.

2. Menu Title:

- A menu's title provides the context for the current set of choices.
- Title must reflect the choice selected on the previously displayed menu.

3. Choice Descriptions:

- Choice descriptions are the alternatives available to the user.
- Can range from a mnemonic, numeric, or alphabetized listing of choices to single words or phrases to full sentences or more.
- Style chosen will reflect
  - experience of the user (novice or expert)
  - nature of the choices (well-learned alternatives or not)
  - nature of the selection mechanism (keyboard or mouse)
  - nature of the system (business system application or Web page).

4. Completion Instructions:

- Completion instructions tell users how to indicate their choices.
- Explicit instructions may be needed for first time or casual users of a system.
- Experienced users will find very wordy instructions unnecessary.
- Needs of all system users and the nature of the system, must be considered in creating this kind of on-screen guidance.

4) Explain the guidelines to be followed for formatting menus.

Ans) The following are the guidelines for formatting menus:

1) Consistency:

- Menu design consistency is an integral component of system usability.
- Provide consistency with the user's expectations.

2) Display:

- If only occasional references to menu options are necessary, the menu may be presented on demand.
- Critical options should be continuously displayed.

3) Presentation:

- A menu and its choices should be immediately recognizable by the user as being a menu of choices.
- Techniques chosen should be consistent throughout the system.

4) Organization:

- Provide a general or main menu.
- Display: - All relevant alternatives.
  - Only relevant alternatives.
- Delete or gray-out inactive choices.

- Match the menu structure to the structure of the task.
- Minimize number of menu levels within limits of clarity.
- Never require menus to be scrolled.

5) Complexity:

- Providing two sets of menus will more effectively satisfy the differing needs of the novice and expert user.
- Expert may prefer a full set of options.

6) Item Arrangement:

- For easy scanning, menu choices should be left-justified and aligned vertically into columns.
- Do not array a menu in multiple columns.

7) Ordering:

- Options must be ordered in meaningful ways.
- Understanding structure and relationships helps in focusing attention on that which is relevant.

8) Groupings:

- Create groupings of items that are logical, distinctive, meaningful, and mutually exclusive.
- Provide immediate access to critical or frequently chosen items.

5) List the different types of graphical menus. Explain any three in detail.

Ans)

1) Menu Bar

2) Pull-Down Menu

3) Cascading Menus

4) Pop-up Menus

5) Tear-off Menus

6) Iconic Menus

7) Pie Menus

Menu Bar:

- A menu bar is the starting point for many dialogs.
- It often consists of a series of textual words.
- It will have a pull-down menu associated with it, detailing the specific actions that may be performed.

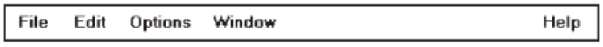


Figure 3.19: Menu bar composed of text

Figure 3.20: Menu bar composed of buttons

Advantages:

They

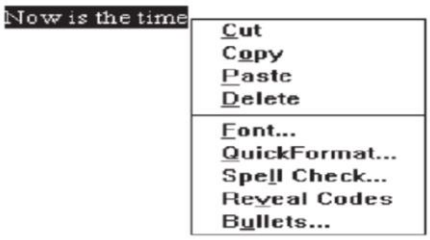
- Are always visible to the user
- Are easy to browse through.
- Are easy to locate consistently on the screen.
- Usually do not obscure the screen working area.

Disadvantages:

- They consume a full row of screen space.
- Their horizontal orientation is less efficient for scanning.
- Their horizontal orientation limits number of choices that can be displayed.

Pop-up Menus:

- Use to present alternatives or choices within the context of the task.
- When positioned over text, for example, a pop-up might include text-specific commands.



Advantages:

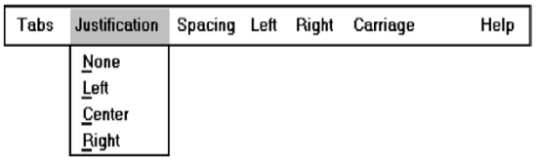
- They appear in the working area.
- They do not use window space when not displayed.
- Their vertical orientation is most efficient scanning.
- Their vertical orientation most efficient for grouping.

Disadvantages:

- Their existence must be learned and remembered.
- They require a special action to see the menu (mouse click).
- Their display locations may not be consistent.

Pull-Down Menu:

- The choices are displayed in a vertically arrayed listing that appears to pull down from the bar.
- Most useful for a small number of rarely changing items.
- Items are represented textually.



Advantages:

- No window space is consumed.
- Easy to browse.
- Most efficient for scanning, grouping.
- More choices to be displayed.

Disadvantages:

- Require searching and selecting.
- Items are smaller.
- They may obscure the screen working area.

Pull-Downs Leading to Another Pull-Down:

Pull-Downs Leading to a Window:

6) Explain the general guidelines that are followed when establishing navigation links.

Ans)

1. Sensible:

- All navigation controls, in the absence of site context, must make sense to the user.
- The user may have "lost" the context, or the page or Web site may have been entered from almost anywhere.

2. Available:

- All navigational controls must be easy to access.
- If they are not readily available, the full advantages of hypermedia may not be achieved.

3. Obvious and distinctive:

- A navigation link or control must look like a navigation control.
- Its appearance to the user must immediately suggest that it is an entity to be clicked or otherwise selected.
- Do not make any other screen element look like a navigation tool if it is not one.

4. Consistent:

- All elements must be consistent in appearance and behaviour.

5. Textual:

- All navigation must have a textual label or description.
- Navigation using textual descriptions is much preferable.
- Textual links are also necessary for users who do not have graphics, or who have chosen not to display graphics.

6. Provide multiple navigation paths:

- Offer multiple paths or ways to move around the Web.
- Provide structural components such as site maps, a table of contents, and indexes to go directly to a point of interest.
- Provide command buttons, such as Next and Previous, to move sequentially.

7) Write a note on keyboard accelerators.

Ans)

- Accelerators are keys, or combinations of keys, that invoke an action regardless of cursor or pointer position.
- Used to activate a menu item without opening the menu.
- Most useful for frequent activities performed by experienced users.
- Some companies call these keys as shortcut keys. They may also be called hot keys.
- They make it easier to accomplish an action.
- Function key shortcuts are usually easier to learn than modifier plus letter shortcuts.
- Pressing no more than two keys simultaneously is preferred; three keystrokes is the maximum.
- Use standard keyboard accelerators when they exist.

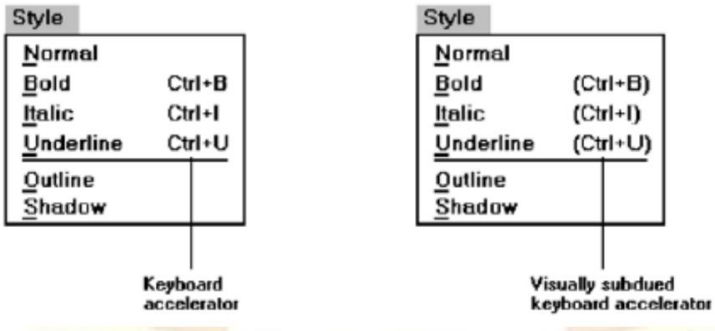


Figure 3.10: keyboard Accelerator

8) Explain the functions of the Menu.

Ans)

1) Displaying information

2) Navigation to new Menu

3) Execute an action or procedure

4) Data or parameter Input

1) Displaying information:

- The main purpose of selecting a menu choice may simply be to display information.
- The user may be searching the database or web.
- The user's focus will be more on information desired rather than on the selection.

2) Navigation to a New Menu:

- Each user selection causes another menu in a hierarchical menu tree to be displayed.
- The purpose of each selection is to steer the user toward an objective or goal.
- Selection errors may lead the user to go in wrong paths, cost time and perhaps, aggravation.
- But these errors are non-destructive and usually unavoidable.

3) Execute an Action or Procedure:

- A user selection directs the computer to implement an action or perform a procedure.
- The action may be something like opening or closing a file, copying text, or sending a message.
- In some cases, execution may only occur after a hierarchical menu tree is navigated.
- In other cases, actions may be performed as successive hierarchical menus are encountered and traversed.

4) Data or Parameter Input:

- Each selection specifies a piece of input data for the system or provides a parameter value.
- Data or values may be input on a single menu or spread over a hierarchy of menus.

9) Explain and illustrate the structure of menus with illustrations.

Ans)

1) Single Menus:

- A single screen or window is presented to seek the user's input or request an action to be performed.
- A single menu may be iterative if it requires data to be entered into it and this data input is subject to a validity check that fails.
- Single menus conceptually require choices from this single menu only, and no other menus will follow necessitating additional user choices.

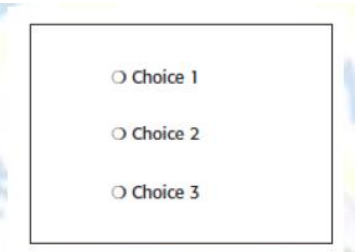


Figure 3.1: Single Menu

2) Sequential Linear Menus:

- Presented on a series of screens possessing only one path.
- Menu screens are presented in a preset order.
- Their objective is to specify parameters or enter the data.
- Length of the path may be short, or long, depending upon the nature of the information being collected.

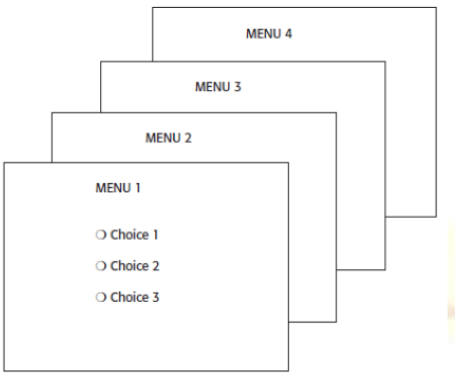


Figure 3.2: sequential linear menu

3) Simultaneous Menus:

- Instead of being presented on separate screens, all menu options are available simultaneously.
- Menu may be completed in the order desired by the user, choices being skipped and returned to later.
- All alternatives are visible for reminding of choices, comparing choices and changing answers.

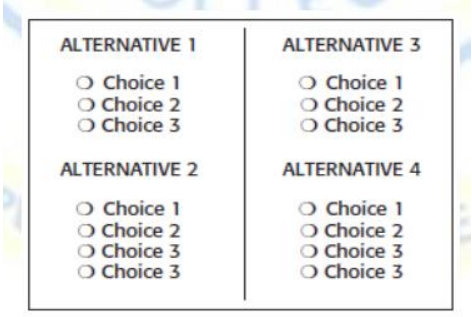


Figure 3.3: Simultaneous Menus

4) Hierarchical Menus:

- When many relationships exist between menu alternatives, and some menu options are only appropriate depending upon a previous menu selection, a hierarchical structure is the best solution.
- A hierarchical structure can best be represented as an inverse tree, leading to more and more branches as one moves downward through it.
- Hierarchies must be consistent with user expectations, and choice uncertainties be reduced as much as possible.
- It must also be easy to back upward through the tree to facilitate exploration of the tree.

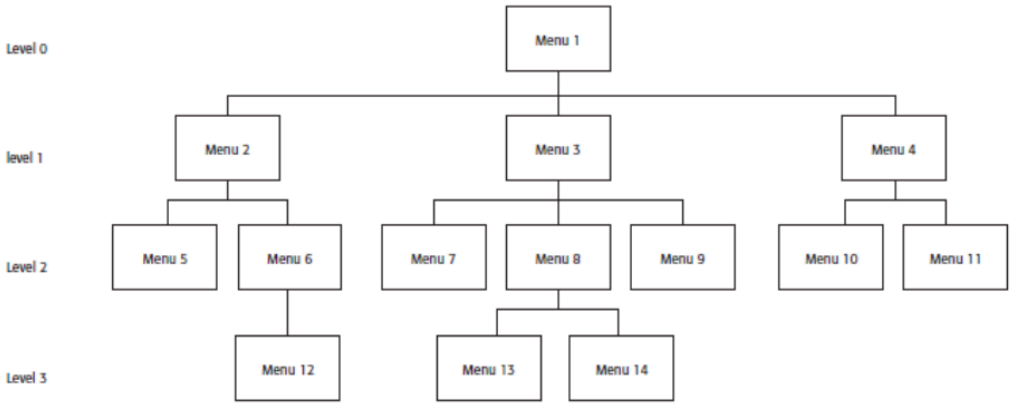


Figure 3.4: Hierarchical Menus

5) Connected Menus:

- Connected menus are networks of menus all interconnected in some manner.
- Movement through a structure of menus is not restricted to a hierarchical tree, but is permitted between most or all menus in the network.
- Advantage: It gives the user full control over the navigation flow.
- Disadvantage: Its complexity, and its navigation may be daunting for an inexperienced user.

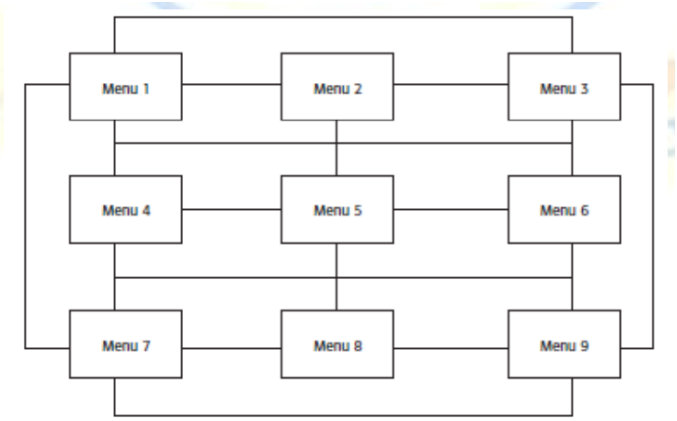


Figure 3.5: Connected Menus

6) Event-Trapping Menus:

- Event Trapping menus provide an ever-present background of control over the system's state and parameters while the user is working on a foreground task.
- They are a set of simultaneous menus imposed on hierarchical menus.
- In a graphical system, for example, existing together are a simultaneous menu, the menu bar, and a hierarchy - the menu bar and its pull-downs.
- These menus can also change content based upon the system state, or an event, existing at that moment.

MODULE 4 QB

-PP

1) Explain the characteristics of window.

Ans) A window possesses the following characteristics:

- A name or title that allows to identify the window.
- A size in height and width (which can vary).
- The contents of active windows can be altered.
- It highlights, that is, the part that is selected.
- Visibility - the portion of the window that can be seen. A window may be partially or fully hidden behind another window.
- Windows may be tiled, overlapping or cascading.
- There are methods to manage and manipulate the windows on the screen.
- It is dedicated to the function, task or application it does.

The Attraction of Windows:

- In single-screen technology, only one screen of information can be viewed at one time.
- To support memory, a person is often forced to write notes or obtain printed copies of screens.
- Windows act as external memories that are an extension of one's internal memory.
- Windows are valuable in terms of tasks or jobs.
- A person is asked to monitor and manipulate data from various sources, synthesize information, summarize information and reorganize information.
- Windows makes it much easier to switch between tasks.
- Windows provide access to a lot of information.

Windows are useful in different ways:

• Presentation of Different Levels of Information.

• Presentation of Multiple Kinds of Information.

• Sequential Presentation of Levels or Kinds of Information.

• Access to Different Sources of Information.

• Combining Multiple Sources of Information.

• Performing More Than One Task.

2) Explain the components of window.

Ans)

1. **Frame:**
   - It is usually rectangular in shape, to define its boundaries and distinguish it from other windows.
   - A border need not be rectangular but this shape is a most preferred shape.

2. **Title Bar:**
   - The title bar is the top edge of the window, inside its border and extending its entire width.
   - Title bars are included on all primary and secondary windows.

3. **Title Bar Icon:**
   - Located at the left corner of the title bar in a primary window.
   - Consists of menu of commands that apply to the object in the window.

4. **Window Sizing Buttons:**
   - Buttons located at the right corner of the title bar.
   - They are used to manipulate the size of a window.

5. **What's This? Button:**
   - To provide contextual Help about objects displayed within a secondary window.
   - It is inscribed with a question mark.

6. **Menu Bar:**
   - Used to organize and provide access to actions.
   - Located horizontally at the top of the window, just below the title bar.

7. **Status Bar:**
   - Information of use to the user can be displayed in a designated screen area or areas.
   - They may be located at the top of the screen in some platforms and called a status area, or at the screen's bottom.

8. **Scroll Bars:**
   - A scroll bar is an elongated rectangular container consisting of a scroll area, with arrows or anchors at each end.
   - Vertical scrolling is positioned at the far right side.
   - Horizontal scrolling is positioned at the bottom of the work area.

9. **Split Box:**
   - Also referred to as a split bar.
   - Splitting a window permits multiple views of an object.

10. **Toolbar:**
    - Also called command bars.
    - Designed to provide quick access to specific commands or options.

11. **Command Area:**
    - Command area can be provided for a command to be typed into a screen.
    - Located at the bottom of the window.

12. **Size Grip:**
    - A size grip is a Microsoft Windows special handle included in a window to permit it to be resized.
    - When the grip is dragged the window resizes.

13. **Work Area:**
    - Portion of the screen where the user performs tasks.
    - Also referred to as the client area.

3) Write the advantages and disadvantages of tiled window.

Ans)

- Tiled windows derive their name from common floor or wall tile.
- Tiled windows appear in one plane on the screen.

Advantages:

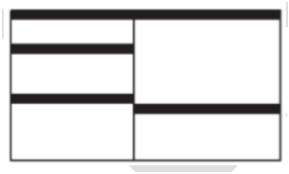
- They are always visible.
- Every window is always completely visible, eliminating the possibility of information being hidden.
- They are easier for inexperienced people to learn and use.
- Better user performance for completing tasks.

Disadvantages:

- Only a limited number can be displayed in the screen area.
- As windows change in size or position, the movement can be confusing.
- They are crowded and more visually complex.
- As the number of displayed windows increases, each window can get very tiny.

4) Explain the window presentation styles.

Ans)



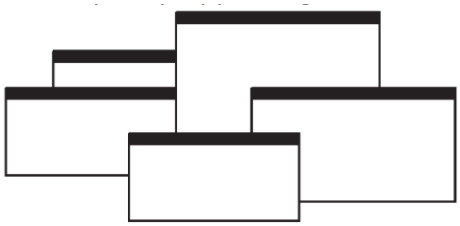
1. Tiled Windows:

(Refer 3rd Ans).

2. Overlapping Windows:

• May be placed on top of one another like papers on a desk.

• Sizes of some types of windows may also be changed.



Advantages:

• Windows can maintain larger sizes.
• Windows can maintain consistent sizes.
• Better user performance for completing tasks.

Disadvantages:

• Information in windows can be hidden behind other windows.
• Much more complex than tiled windows.

3. Cascading Windows:

• Special type of overlapping window.

• Each window is slightly offset from others.

Advantages:

- Bringing any window to the front is easier.
- It provides simplicity in visual presentation and cleanness.
- No window is ever completely hidden.
- It is easy to maintain.

5) Explain the different types of windows with examples.

Ans)

Primary Window:

- Use to present constantly used window components and controls.
- Used for presenting information that is continually updated.
- **Menu bar items**: that are used frequently, by primary or secondary windows.

Secondary Window:

Model:

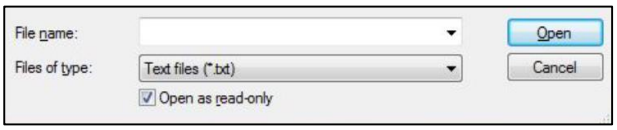
- Used when interaction with any other window must not be permitted.
- Used for:
  - Presenting information. For example, messages (sometimes called a message box).
  - Receiving user input. For example, data or information (sometimes called a prompt box).
  - Asking questions. For example, data, information, or directions.
- Use carefully because it constrains what the user can do.

Modeless:

- Use when interaction with other windows must be permitted.
- Use when interaction with other windows must be repeated.

Dialog Boxes:

- Use for presenting brief messages.
- Use for performing actions that take a short time to complete.
- Command buttons to include:
  - OK.
  - Cancel.
  - Others as necessary.

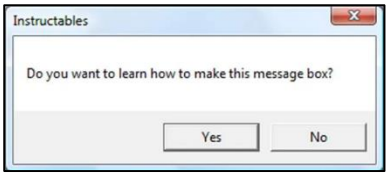


Property Sheets and Property Inspectors:

- Use for presenting the complete set of properties for an object.
- Make changes dynamically.
- Command buttons to include: OK, Cancel, Apply, Reset.

Message Boxes:

- Use for displaying a message about a particular situation or condition.
- Command buttons to include: OK, Cancel, Help, Yes and No, Stop Buttons.
- Designate the most frequent or least destructive option as the default command.



Pop-up Windows:

- It displays:
  - Additional information when an abbreviated form of the information is the main presentation.
  - Textual labels for graphical controls.
  - Context-sensitive Help information.
- Ex: Tool Tips and Balloon Tips
- Do not contain Title bar and Close button.

Palette Windows:

- Used to present a set of controls.
- It is fixed in size.
- They are distinguished by their visual appearance, a collection of images, colors or patterns.
- It has a Title bar and Close button.

6) What are the different window management schemes? Discuss any two schemes.

Ans)

The different window management schemes are:

1. Single-Document Interface
2. Multiple-Document Interface
3. Workbooks
4. Projects

(Learn any 2 schemas from below)

1. Single-Document Interface:

Description: A single primary window with a set of secondary windows.

Proper usage:
• Where object and window have a simple, one-to-one relationship.
• To support simultaneous views by splitting the window into panes.

Advantages:
• Most commonly used.
• Window manipulation is easier and less confusing.
• Data centered approach.

Disadvantage:
- Information is displayed or edited in separate windows.

2. Multiple-Document Interface

Description:
• A technique for managing a set of windows where documents are opened into windows.

Proper usage:
• To present multiple occurrences of an object.
• To present multiple parts of an application.

Advantages:
• Useful for managing a set of objects.
• Provides a grouping and focus for a set of activities within the larger environment of the desktop.

Disadvantages:
• Makes the application to have more importance as the primary focus.

3. Workbooks

Description:
• A window or task management technique that consists of a set of views organized like a tabbed notebook.

Proper Usage:
• To manage a set of views of an object.
• For content where the order of the sections is significant.

Advantages:
• Provides a grouping and focus for a set of activities within the larger environment of the desktop.
• Conserves screen real estate.
• Provides the greater simplicity of the single-document window interface.

Disadvantage:
• Cannot present simultaneous views.

4. Projects

Description:

A technique that consists of a container: a project window holding a set of objects.

Proper usage:
• To manage a set of objects that do not necessarily need to be contained.
• When child windows are not to be constrained.

Advantages:
• Provides a grouping and focus for a set of activities within the larger environment of the desktop.
• Preserves some management capabilities of the multiple document interface.
• Provides the greatest flexibility in the placement and arrangement of windows.

Disadvantage:
- Increased complexity due to difficulty in differentiating peer primary windows of the project from windows of other applications.

7) Explain the general guidelines to be followed while designing various windows operations.

Ans)

1) Active Window:

• A window should be made active with as few steps as possible.

• Visually differentiate the active window from other windows.

• Design easy to use and learn windowing operations.

• Make the setting up of windows particularly easy to remember.

• In overlapping systems, provide powerful commands for arranging windows on the screen.

2) Opening a Window:

• Provide an iconic representation or textual list of available windows.
• When opening a window: Position the opening window in the most forward plane of the screen.
• Adapt the window to the size and shape of the monitor on which it will be presented.
• Designate it as the active window.
• Ensure that its title bar is visible.
• When a primary window is opened or restored, position it on top.
• When a dependent secondary window is opened, position it on top of its associated primary window.
• If more than one object is selected and opened, display each object in a separate window.

3) Sizing Windows

• Provide large-enough windows to: Present all relevant and expected information for the task.
• Avoid hiding important information.
• Avoid crowding or visual confusion.
• Minimize the need for scrolling.
• Optimum window sizes: For text, about 12 lines. For alphanumeric information, about 7 lines.

4) Window Placement:

• Position the window so it is entirely visible.
• If the window is being restored, place the window where it last appeared.
• Do not let the user move a window to a position where it cannot be easily repositioned.

5) Window Separation:

• Provide a surrounding solid line border for the window.
• Provide a window background that differentiates it from screen background.
• Consider incorporating a drop shadow beneath the window.

6) Moving a Window:

• Permit the user to change the position of all windows.
• Change the pointer shape to indicate that the move selection is successful.
• Move the entire window as the pointer moves.
• Try to move the entire window along with the pointer.
• It may be necessary for a window to be moved if not active.

7) Resizing a Window:

- Permit the user to change the size of primary windows.
- Change the pointer shape to indicate that the resizing selection is successful.
- The simplest operation is to anchor the upper-left corner and resize from the lower right corner.
- Flexibility can be provided by permitting resizing to occur from any point on the border.
- Show the changing window as the pointer moves.
- Change image size proportionally as window size changes.
- Resize a window when it is not active, if necessary.

8) Other Operations:

- Maximizing a window increases to its largest optimum size.
- Minimizing a window reduces it to its smallest size.
- Restoring returns a window to its previous size and position.

9) Window Shuffling:

• Permit rapid window shuffling and the swapping of the front window and the second or back window.

10) Keyboard Control/Mouseless Operation:

• Keyboard alternatives should be designated through use of mnemonic codes as much as possible.
• Keyboard designations should be capable of being modified by the user.

11) Closing a Window:

• Close a window when:
  - The user requests that it be closed.
  - The window has no further relevance.

• If a primary window is closed, also close all of its secondary windows.

• When a window is closed, save its current state, including size and position, for use when the window is opened again.

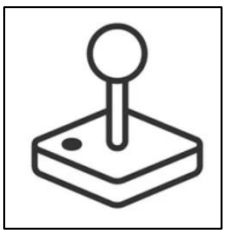
8) Explain the characteristics of Joystick and trackball.

Ans)

Joystick:

Description:

• A stick or bat-shaped device anchored at the bottom.
• Variable in size, smaller ones being operated by fingers, larger ones require the whole hand.
• Variable in cursor direction movement method.



Advantages:

• Direct relationship between hand and pointer movement in terms of direction.
• Does not obscure vision of screen.
• Does not require additional desk space (if mounted on keyboard).

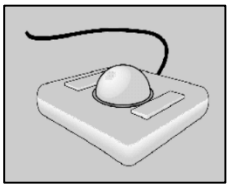
Disadvantages:

• Movement indirect, in plane different from screen.
• Indirect relationship between hand and pointer in terms of speed and distance.
• Requires a degree of eye-hand coordination.

• Requires hand to be removed from keyboard keys.
• Requires different hand movements to use.
• Requires hand to be removed from keyboard (if not mounted on keyboard).
• Requires additional desk space (if not mounted on keyboard).
• May be fatiguing to use over extended time.

Trackball:

Description:



• A spherical object (ball) that rotates freely in all directions in its socket.
• Direction and speed is tracked and translated into cursor movement.

Advantages:
• Direct relationship between hand and pointer movement in terms of direction and speed.
• Does not obscure vision of screen.
• Does not require additional desk space (if mounted on keyboard).

Disadvantages:
• Movement is indirect, in a plane different from the screen.
• No direct relationship exists between hand and pointer movement in terms of distance.
• Requires a degree of eye-hand coordination.
• Requires hand to be removed from keyboard keys.
• Requires different hand movements.
• Requires hand to be removed from keyboard (if not mounted on keyboard).
• Requires additional desk space (if not mounted on keyboard).
• May be difficult to control.

9) Describe the guidelines for selecting proper device based controls.

Ans) The guidelines for selecting proper device based controls are:

- Screen objects should be at least 3/4″ × 3/4″ in size.
- Object separation should be at least 1/8″.
- Provide visual feedback in response to activation.
- Auditory feedback may also be appropriate.
- When the consequences are destructive, it requires confirmation after selection to eliminate the unintentionally done selection.
- Provide an instructional invitation to begin using.

10) Explain the characteristics of Touch Screen and Keyboard.
Ans)

Touch Screen:

- A touch screen is a screen that consists of a special surface sensitive to finger touch.
- In touch screens, selection is accomplished by lifting the finger off the screen.
- This may allow more accurate item selection.

Advantages:

- Direct relationship between hand and pointer movement interms of direction, distance and speed.
- This relationship is direct because the control is on the same plane as the pointer.
- It does not require any additional desk space.

Disadvantages:

- They are fatiguing to use over an extended period of time.
- Fingers may soil the screen and damage it.

Keyboard:

- Commonly called the QWERTY layout.
- There are a number of keys on the keyboard that perform specific functions.
- Some of the functions of the mouse can be performed by using a keyboard.

Advantages:

- The standard keyboard is familiar, accurate and does not consume additional desk space.
- It is useful and efficient for entering or inserting text or alphanumeric data.
- A mouse with a limited number of buttons will require use of the keyboard to accomplish some functions.
- The keyboard is flexible enough to accept keyed shortcuts, either keyboard accelerators or mnemonic equivalents.

Disadvantages:

- No direct relationship between finger or hand movement on the keys and cursor movement on the screen in terms of speed and distance.
- Keyboards will be slower for non-touch typists and slower than other controls in pointing task.

MODULE 5 QB

-PP

1) What are operable controls? Explain Usage of buttons along with their advantages and disadvantages.

Ans) Operable controls are those that permit the entry, selection, changing or editing of a particular value, or cause a command to be performed.

Proper usage of Buttons:

Use for frequently used actions that are specific to a window:

- To start actions.
- To change properties.
- To display a pop-up menu.
- To cause something to happen immediately.
- To display another window.
- To display a menu of options.
- To set a mode or property value.

Advantages:

- Always visible, reminding one of the choices available.
- Easy to use and can be logically organized in the work area.
- Can provide meaningful descriptions of the actions that will be performed.
- Selection is faster if size is large.
- Can possess 3-D appearance(pleasing style to the screen).
- May permit use of keyboard equivalents and accelerators.
- Faster than using a two-step menu bar/pull-down sequence.

Disadvantages:

- Consumes screen space.
- Size limits the number that may be displayed.
- Requires looking away from main working area to activate.
- Requires moving the pointer to select.

2) Explain the following controls with an example for each:

a. Radio buttons

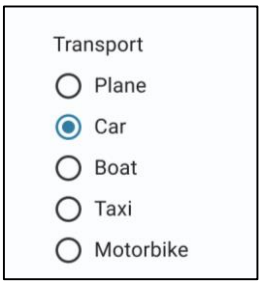
Ans)

Description:

- Radio box permits selection of only one option.

A two-part control consisting of the following:

- Small circles, diamonds, or rectangles.
- Choice descriptions



When a choice is selected:

- The option is highlighted.
- Rest other choices are unhighlighted and deselected.

Advantages:

- They provide Easy-to-access choices and Easy-to-compare choices.
- They are preferred by users.

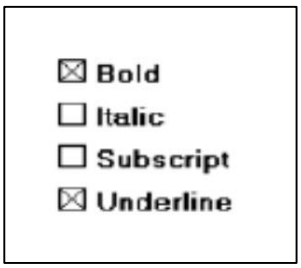
Disadvantages:

- Consume screen space
- Limited number of choices.

b. Check Boxes

Ans)

Description:



- Check box permits selection of more than one option.
- Each box can be:
  - Switched on or off independently.
  - Used alone or grouped in sets.

Advantages:

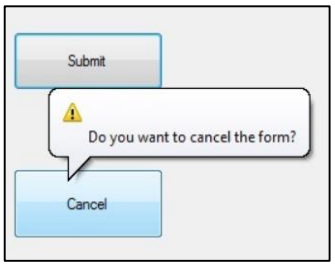
- They provide Easy-to-access choices and Easy-to-compare choices.
- They are preferred by users.

Disadvantages:

- Consume screen space.
- Provide limited number of choices.
- Single check boxes are difficult to align with other screen controls.

c. Tool tips

Ans) Tooltips are short information messages that become visible when users hover over a particular screen element.



Advantages:

- Provides information for unlabeled icons.
- It explains complex features.

Disadvantages:

- It may be redundant and distracting.

d. Progress indicators

Ans)

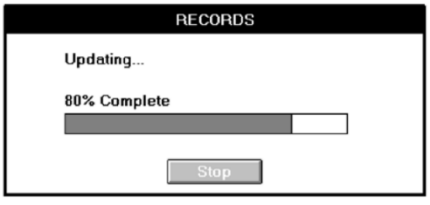
Description:

- A rectangular bar that indicating the percentage of the process that has been completed.

Purpose:

- To provide feedback concerning the completion of a lengthy operation.

Guidelines:



- Fill it with a color or a shade of gray.
- Place text outside of the control.

e. Sample boxes

Ans)

Description:

- A box illustrating what will show up on the screen based upon the parameter or parameters selected.
- May include text, graphics, or both.

Purpose:

- To provide a representation of actual screen content based upon the parameter or parameters selected.

Guidelines:

- Include a brief label.
- Locate it adjacent to the controls upon which it is dependent.

3) Write a note on think-Aloud-Evaluations and Usability test.

Ans)

Think-Aloud Evaluations:

Description:

- Users perform specific tasks while thinking out load.
- Comments are recorded and analyzed.

Advantages:

- Makes use of actual representative tasks.
- Provides better understanding for the user's reasoning.

Disadvantages:

- May be difficult to get users to think out loud.

Guidelines:

- Develop:
  - Several core or representative tasks.
  - Tasks of particular concern.
- Limit session to 60 to 90 minutes.

Usability Test:

Description:

- An interface evaluation under real-world or controlled conditions.
- Measures of performance are derived for specific tasks.
- Problems are identified.

Advantages:

- Utilizes an actual work environment.
- Identifies serious or recurring problems.

Disadvantages:

- Facilities are expensive.
- Requires a test conductor with user interface expertise.
- Poorly suited for detecting inconsistency problems.

4) Explain Cognitive Walkthroughs and Heuristic Evaluation tests conducted in user interface design.

Ans)

Cognitive Walkthroughs:

Description:

- Takes the reviews of the interface in which the users perform.
- The user's goals and assumptions must also be clearly defined before the walkthrough is performed.

Advantages:

- Allow a clear evaluation of the task flow early in the design process.
- Do not require a functioning prototype.
- Low cost.
- Can be used to evaluate alternate solutions and can be performed by developers.
- More structured than a heuristic evaluation.

Disadvantages:

- Slow performance.
- May miss inconsistencies and general and recurring problems.

Guidelines:

- Start with simple tasks.
- Don't get stuck while finding solutions.
- Limit session to 60 to 90 minutes.

Heuristic Evaluation test process:

Preparing the session:

- Select evaluators and prepare a project overview and a checklist of heuristics.
- Provide briefing to evaluators to:
  - Review the purpose of the evaluation session and preview the evaluation process.
  - Present the project overview and heuristics.
  - Answer any evaluator questions and provide any special evaluator training that may be necessary.

Conducting the session

- Have each evaluator to review the system alone.
- The evaluator should:
  - Establish own process or method of reviewing the system.
  - Provide usage scenarios, if necessary.
  - Identify any other relevant problems or issues.
  - Make at least two passes through the system.

- Detected problems should be related to the specific heuristics they violate.
- Comments are recorded either by the evaluator or an observer.
- The observer may answer questions and provide hints.
- Restrict the length of the session to not more than 2 hours.

After the session:

- This session includes observers and design team members where:
  - Each evaluator presents problems detected and the heuristic it violated.
  - Design suggestions for improving those problems that are discussed.

After the debriefing session:

- Here, ratings are given to the composite list of violation.
- Request evaluators to assign their ratings to each violation.
- Analyze results and establish a program to correct these violations and deficiencies.

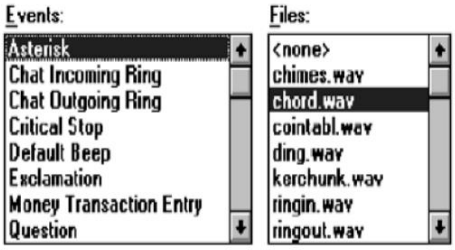
5) Define selection control. Briefly explain List Boxes and List view controls.

Ans) A selection control provides all the possible alternatives, conditions or choices that may exist for an entity, property or value, on the screen.

List Boxes:

Description:

- A permanently displayed box-shaped control containing a list of attributes or objects from which a single or multiple selections can be made.
- The choice may be text, pictorial representations or graphics.
- Selections are made by using a mouse to point and click.
- Capable of being scrolled to view large lists of choices.
- No text entry field exists here.



Advantages:

- They can provide unlimited number of choices.
- They remind users of available options.
- They are always visible.

Disadvantages:

- They consume screen space.
- They often need to be scrolled to see all list choices.
- The list may be ordered in an unpredictable way, making it hard to find items.

List View Controls:

Description

- A special extended-selection list box that displays a collection of items, consisting of an icon and a label.

- The contents can be displayed in four different views:
  - **Large Icon:** Items appear as a full-sized icon with a label below.
  - **Small Icon:** Items appear as a small icon with label to the right.
  - **List:** Items appear as a small icon with label to the right. Arrayed in a columnar, sorted layout.
  - **Report:** Items appear as a line in a multicolumn format.

Purpose and usage:

- Where the representation of objects as icons is appropriate.
- To represent items with multiple columns of information.

6) List all and explain any three presentation controls.

Ans)

1) Static Text Fields

2) Group Boxes

3) Column Headings

4) ToolTips

5) Balloon Tips

6) Progress Indicators

7) Sample Box

8) Scrolling Tickers

ToolTips:

Description:

A small pop-up window providing an additional descriptive or status information that appears when a pointer is moved over a control or element.

Purpose: To provide descriptive information about a control or screen element.

Advantages:

- Identifies an unidentified control/element.
- Enables control size to be reduced.

Disadvantages:

- Not obvious, must be discovered.
- Unnecessary appearance can be distracting.

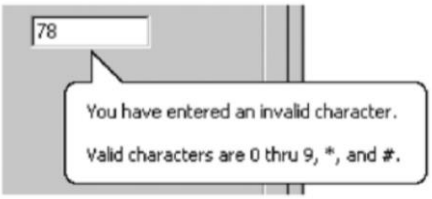
Proper usage:

- To identify a control that has no caption.
- To provide additional descriptive or status information about a screen element.

Balloon Tips:

Description:

- A small pop-up window that contains information in a word balloon.
- Components can include - Title, Body text and Message Icons.
- Appear adjacent to the item to which they apply, generally above or to left.
- Tips are removed after a specified time period.



Purpose: To provide additional descriptive or status information about a screen element.

Advantage:

- Provides useful reminder and status information.

Disadvantages:

- If overused they lose their attention-getting value.
- If overused in situations the user considers not very important.

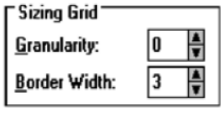
Group Boxes:

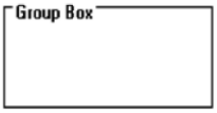
Description:

- A rectangular frame that surrounds a control or group of controls.
- An optional caption may be included in the frame's upper-left corner.

Purpose:

- To visually relate the elements of a control.
- To visually relate a group of related controls.





Proper usage:

- To provide a border around radio button or check box controls.
- To provide a border around two or more functionally related controls.

Guidelines:

Label or heading:

- Typically, use a noun or noun phrase for the label or heading.
- Let heading be of one or two words.
- Relate label or heading's content to the group box's content.
- Capitalize the first letter of each significant word.
- Do not include a colon (:) at the end.

7) Explain the purpose of prototypes. Discuss any two types of prototypes with their importance to system developers.

Ans)

- A prototype is primarily a vehicle for exploration, communication and evaluation.
- Its purpose is to obtain user input in design and to provide feedback to designers.
- A prototype is a simulation of an actual system that can be quickly created.

- A prototype may be a rough approximation, such as a simple hand-drawn sketch or it may be interactive.
- A prototype may include as many features as possible to present concepts and overall organization.
- Some of the types of prototypes are:
  1) Hand Sketches and Scenarios
  2) Interactive Paper Prototypes
  3) Programmed Facades
  4) Prototype-Oriented Languages

Hand Sketches and Scenarios:

Description:

- Screen sketches created by hand.
- Focus is on the design, not the interface mechanics.
- A low-fidelity prototype.

Advantages:

- Can be used very early in the development process.
- No large investment of time and cost.
- No programming skill needed.
- Easily portable.
- Fast to modify and iterate.
- Can be used to define requirements.

Disadvantages:

- Only a rough approximation.
- Limited in providing an understanding of navigation and flow.
- A demonstration, not an exercise.
- Limited usefulness for a usability test.
- A poor detailed specification for writing the code.
- Driven by a facilitator, not the user.
- Usually restricted to most common tasks.

Interactive Paper Prototypes

Description:

- Interface components (menus, windows and screens) constructed of common paper technologies.
- The components are manually manipulated to reflect the dynamics of the software.
- A low-fidelity prototype.

Advantages:

- More illustrative of program dynamics than sketches.
- Can be used to demonstrate the interaction.
- Generally, same as for hand-drawn sketches and scenarios.

Disadvantages:

- Only a rough approximation.
- A demonstration, not an exercise.
- Driven by a facilitator, not the user.
- Limited usefulness for usability testing

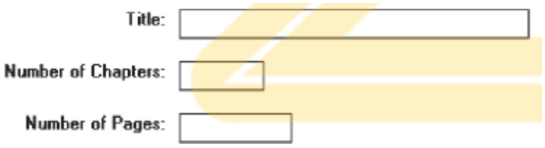
8) Explain the following.
i) Text-box

Ans)

- A control, usually rectangular in shape, in which:
  - Text may be entered or edited. It may also be referred to as an edit control.
  - Text may be displayed for read-only purposes. It is also referred to as an display field.
- Two types of text boxes exist, Single-Line and Multiple-Line Text Boxes.

Purpose:

- To permit the display, entering, or editing of textual information.
- To display read-only information.



Advantages:

- They are very flexible.
- They are much familiar.
- They consume little screen space.

Disadvantages:

- They require the use of typewriter keyboard.
- They require user to remember what must be keyed.

ii) Caption

Ans)
Structure and size:

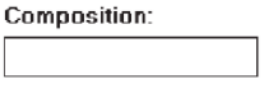
- Provide a descriptive caption to identify the kind of information to be typed within the text box.
- Use a mixed-case font.
- Display the caption in normal intensity or in a color of moderate brightness.

Formatting:

Single fields:

- Position the field caption to the left of the text box.
  - Place a colon (:) immediately following the caption.
  - Separate the colon from the text box by one space.

- Alternately, the caption may be placed above the text box.
  - Place a colon (:) immediately following the caption.
  - Position above the upper-left corner of the box.



Multiple occurrence fields:

- For entry/modification text boxes.
- Position the caption left-justified one line above the column of entry fields.