



**CMR Institute of Technology, Bangalore**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**III - INTERNAL ASSESSMENT**

Semester: 8-CBCS 2017

Date: 17 Jul 2021

Subject: USER INTERFACE DESIGN (PE) (17CS832)

Faculty: Dr Anand R

Time: 01:00 PM - 02:30 PM

Max Marks: 50

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**Instructions to Students:**

Answer any Five Full Questions

ANSWER ALL QUESTIONS

Marks CO PO BT/CL

1. Explain the purpose of prototypes. Discuss any two kinds of prototypes with their importance to system developers. [10.0] 1 [2] [2]

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.

- **Hand Sketches and Scenarios**
- **Sketch Creation Process**
- **Interactive Paper Prototypes**
- **Programmed Facades**
- **Prototype-Oriented Languages**

2. What are Operable Controls?. Explain the usage of Buttons along with its advantage and disadvantages. [10.0] 1 [3] [2]

**Buttons**

- **Description:**
  - A square or rectangular-shaped control with a label inside that indicates action to be accomplished.
  - The label may consist of text, graphics, or both.
- **Purpose:**
  - To start actions.
  - To change properties.
  - To display a pop-up menu.
- **Advantages:**
  - Always visible, reminding one of the choices available.

- Convenient.
- Can be logically organized in the work area.
- Can provide meaningful descriptions of the actions that will be performed.



Command buttons.



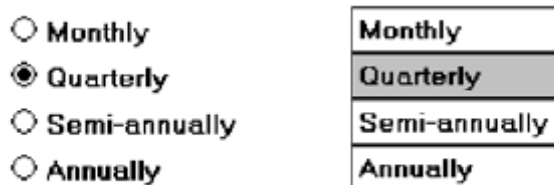
Toolbar buttons without labels.

3. Explain the following controls with examples Radio Buttons, Check Boxes and List Boxes.

[10.0] 1 [3] [2]

### Radio Buttons

- Description:
  - A two-part control consisting of the following:
    - Small circles, diamonds, or rectangles.
    - Choice descriptions.
  - When a choice is selected:
    - The option is highlighted.
    - Any existing choice is automatically unhighlighted and deselected.
- Purpose:
  - To set one item from a small set of mutually exclusive options (2 to 8).
- Advantages:
  - Easy-to-access choices.
  - Easy-to-compare choices.
  - Preferred by users.



### Check Boxes

Description:

- A two-part control consisting of a square box and choice description.
- Each option acts as a switch and can be either “on” or “off.”
- When an option is selected (on), a mark such as an “X” or “check” appears within the square box, or the box is highlighted in some other manner.
- Otherwise the square box is unselected or empty (off).
- Each box can be:
  - Switched on or off independently.

## List Boxes

- Bold**
- Italic**
- Subscript**
- Underline**

**Bold**

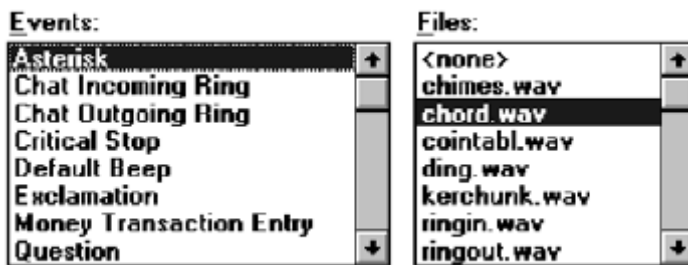
**Italic**

**Subscript**

**Underline**

- Always Create Backup Copy
- Allow Fast Saves
- Prompt for Document Properties
- Prompt to Save Normal Template
- Save Native Picture Formats Only
- Embed TrueType Fonts
- Save Data Only for Forms
- Automatic Save Every:

- Description:
  - A permanently displayed box-shaped control containing a list of attributes or objects from which:
    - A single selection is made (mutually exclusive), or
    - Multiple selections are made (non-mutually-exclusive).
  - 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 in which to type text.
  - A list box may be associated with a *summary list box* control, which allows the selected choice to be displayed or an item added to the list.



4. Explain the cognitive walkthroughs, think aloud evaluations and usability test conducted in the user interface design. [10.0] 1 [3] [3]

### **Cognitive Walkthroughs**

Description:

- Reviews of the interface in the context of tasks users perform.

Advantages:

- Allow a clear evaluation of the task flow early in the design process.
- Do not require a functioning prototype.
- Low cost.

### **Think-Aloud Evaluations**

#### Description:

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

#### Advantages:

- Utilizes actual representative tasks.
- Provides insights into the user's reasoning.

### **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.

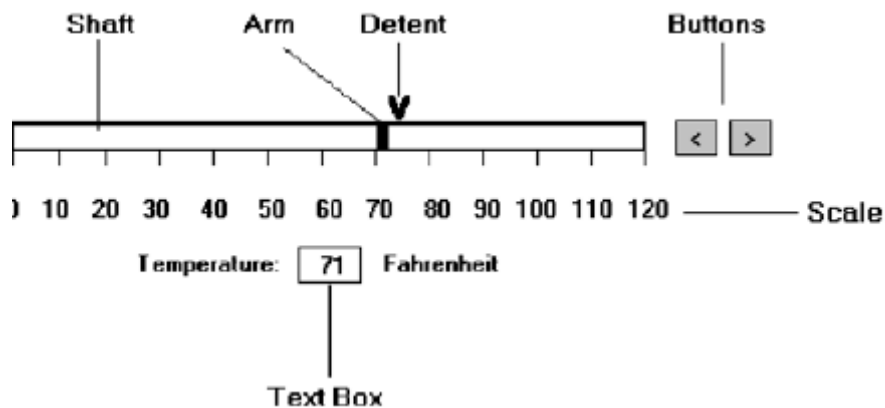
5. Explain the Slider and tree view operable controls.

[10.0] 1 [3] [2]

#### Description:

- A scale exhibiting degrees of a quality on a continuum.
- Includes the following:
  - A shaft or bar.
  - A range of values with appropriate labels.
  - An arm indicating relative setting through its location on the shaft.

- Optionally, a pair of buttons to permit incremental movement of the slider arm.
- Optionally, a text box for typing or displaying an exact value.
- Optionally, a detent position for special values.



### Caption and Labels

Scale

Slider Arm

Slider Buttons

Detents

Proportions

6. Explain the concept of Direct and indirect Manipulation for user interface design

[10.0] 1 [2] [2]

### Direct Manipulation

- The system is portrayed as an extension of the real world
- Continuous visibility of objects and actions
- Actions are rapid and incremental with visible display of results
- Incremental actions are easily reversible

### 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.

7. Define Interaction Styles. Explain the various types of interaction styles in the graphical systems. [10.0] 1 [1] [2]

Command Line

Menu Selection

Form Fill-in

Direct Manipulation

Anthropomorphic

STYLE	ADVANTAGES	DISADVANTAGES
Command Line	Powerful Flexible Appeals to expert users Conserves screen space	Commands must be memorized Requires learning Intolerant of typing errors Difficult for casual users

STYLE	ADVANTAGES	DISADVANTAGES
Menu Selection	Utilizes recognition memory Reduces interaction complexity Aids decision-making process Minimizes typing Aids casual users	May slow knowledgeable users Consumes screen space May create complex menu hierarchies
Form Fill-in	Familiar format Simplifies information entry Requires minimal training	Consumes screen space Requires careful and efficient design Does not prevent typing errors
Direct Manipulation	Faster learning Easier remembering Exploits visual/spatial cues Easy error recovery Provides context Immediate feedback	Greater design complexity Window manipulation requirements Requires icon recognition Inefficient for touch typists Increased chance for screen clutter
Anthropomorphic	Natural	Difficult to implement