**EXPERIMENT NO: 6**

**Aim:** Design of User interface for the system using various interaction styles.

**Theory:**

**Menus**

* **The structures of menus:** Menus vary in form from very simple to very complex. They may range from small dialog boxes requesting the user to choose between one of two alternatives, to hierarchical tree schemes with many branches and levels of depth. A menu’s structure defines the amount of control given to the user in performing a task. The most common structures are the following.

**Single Menus:** In this simplest form of menu, a single screen or window is presented to seek the user’s input or request an action to be performed.

**Sequential Linear Menus:** Sequential linear menus are presented on a series of screens possessing only one path.

**Simultaneous Menus:** Instead of being presented on separate screens, all menu options are available simultaneously.

**Hierarchical or Sequential 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.

**Connected Menus:** Connected menus are networks of menus all interconnected in some manner.

**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.

* **The functions of menus:** From the user’s perspective, a menu can be used to perform several functions: To navigate to a new menu, to execute an action or procedure, to display information, or to input data or parameters.
* **The content of menus:** A menu consists of four elements: its *context*, its *title*, its *choice descriptions*, and its *completion instructions*.
* **Web site navigation and links:** Navigation refers to the method people use to find what they want in a Web site.

**Orientation:** One’s current location relative to nearby objects and the destination must be determined. This is called orientation.

**Route monitoring:** The chosen route must be monitored to confirm that it is leading to the proper destination.

**Destination recognition:** The destination, when it is found, must be easily recognized.

* **Web site navigation elements:** A Web site contains at least three levels of navigation elements: *global* or *site-wide*; *local* and *specific*; and *minor* or *footnote*. Clearly differentiate these navigation elements from one another and locate them consistently from page to page.

**Global:** Global or site-wide navigation elements provide access to the site’s total scope or categories of available information.

**Category or topical:** Local, specific and contextual navigation elements within the category or topical area being presented are typically displayed in a columnar array down the left page side.

**Embedded links:** Phrases or embedded links will be provided within the contents area of a Web page.

**Minor:** Minor illustrative, parenthetical, or footnote links can be arrayed horizontally at the page bottom.

* **Type of menus:**

**Menu Bar:** The highest-level graphical system menu is commonly called the menu bar. A menu bar consists of a collection of descriptions that serve as headings or titles for a series of actions on an associated pull-down menu.

**Pull-down Menu:** Pull-downs are first-level menus used to provide access to common and frequently used application actions that take place on a wide variety of different windows.

**Windows**

* **A window’s characteristics:**

A name or title, allowing it to be identified.

A size in height and width (which can vary).

A state, accessible or active, or not accessible. (Only active windows can have their contents altered.)

Visibility — the portion that can be seen. (A window may be partially or fully hidden behind another window, or the information within a window may extend beyond the window’s display area.)

Management capabilities, methods for manipulation of the window on the screen.

Its highlight, that is, the part that is selected.

The function, task, or application to which it is dedicated.

* **A window’s components:**

**Frame:** A window will have a frame or border, usually rectangular in shape, to define its boundaries and distinguish it from other windows.

**Title Bar:** The title bar is the top edge of the window, inside its border and extending its entire width. This title bar is also referred to by some platforms as the *caption*, *caption bar*, or *title area*.

**Title Bar Icon:** Located at the left corner of the title bar in a primary window, this button is used in Windows to retrieve a pull-down menu of commands that apply to the object in the window. It is a 16×16 version of the icon of the object being viewed.

**Window Sizing Buttons:** Located at the right corner of the title bar, these buttons are used to manipulate the size of a window.

* **A window’s presentation style:** The presentation style of a window refers to its spatial relationship to other windows. There are two basic styles, commonly called tiled or overlapping.

**Tiled Windows:** Tiled windows, illustrated in Figure 5.4, derive their name from the common floor or wall tile. Tiled windows appear in one plane on the screen and expand or contract to fill up the display surface, as needed.

**Overlapping Windows:** Overlapping windows may be placed on top of one another like papers on a desk. They possess a three-dimensional quality, appearing to lie on different planes.

**Cascading Windows:** A special type of overlapping window has the windows automatically arranged in a regular progression. Each window is slightly offset from others.

* **The types of windows available:** Defining standard window types is again difficult across platforms because of the varying terminology and definitions used by different windowing systems, and changes in terminology for new versions of systems.

**Primary Windows:** The *primary* window is the first one that appears on a screen when an activity or action is started. It is required for every function or application, possessing a menu bar and some basic action controls, as previously described.

**Secondary Windows:** Secondary windows are supplemental windows. Secondary windows may be dependent upon a primary window or displayed independently of the primary window. They structurally resemble a primary window, possessing some of the same action controls (Close button) and possibly what’s this? Button.

* **Web system frames and pop-up windows:** Historically, the Web is essentially a single page (or, by analogy, a single window) entity. While providing significant interface benefits, it is also a reversal of the interface evolution process that led from single-screen technology to windowing. To counteract this shortcoming, *frames* were created. A frame is an independent pane of information presented in a Web page, or, again by analogy, as multiple windows. Frames, however, are presented as tiled, with no overlapping capability. The interaction richness, support, and contextual cues provided by overlapping windows are lacking. Frames, then, allow the displaying of multiple documents on a single Web page. These multiple documents can be independently viewed, scrolled, and updated.

**Screen Based Controls:**

Screen Based controls, often simply called controls and sometimes called widgets. By

definitions, they are graphic objects that represent the properties or operations of other

objects.

Different types of Screen-based controls are as explained below:

1. **Operable Controls**: Operable controls are those that permit the entry, selection,

changing, or editing of a particular value, or cause a command to be performed.

Buttons: 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. Types include command buttons and toolbars.

**2. Text entry/read-only:** We have two kinds of controls in the text-entry

category: entry boxes and read only boxes.

For entry boxes: - Place a colon (:) immediately following the caption. For

single fields, caption can be located in front of upper-left corner of the

box. For multiple fields, position the caption upper left of the box.

For read-only boxes: - If the data field is long or about the same length,

center the caption above the displayed text box. If the data is

alphanumeric, short, or quite variable in length, left-justify the caption

above the displayed. If the data field is numeric and variable in length,

right-justify the caption above the displayed

**3. Selection Controls:** A selection control presents on the screen all the

possible alternatives, conditions or choices that may exist for an entity,

property or a value. It includes radio buttons, checkboxes, list boxes, drop-

down/pop-up list boxes, and palettes.

**4. Combination Entry/Selection Controls**: It is possible for a control to

possess the characteristic of both a text field and a selection field. In this

type of control, information may either be keyed into the field or selected

and placed within it. The types of combination entry/selection fields are

spin boxes, attached combination boxes, and drop-down/pop-up

combination boxes.

**5**. **Presentation controls:** - Presentation controls are purely informational.

They provide details about other screen elements or controls or assist in

giving the screen structure. Common Presentation controls are static text

fields, group boxes column headings, tooltips, balloon tips, and progress

indicators.

**6. Other Operable** **controls**: Other more specialized operable controls also

exist. Among them are sliders, tabs, date pickers and scroll bars.

**Device Based Controls:**

Device-based controls, often called input devices, are the mechanisms through which

people communicate their desires to the system.

**Characteristics and capabilities of device-based control:** Selecting the proper device-

based control to do the required job is critical to system success. A good fit between user

and control will lead to fast, accurate performance. A poor fit will result in lower

productivity, produce more errors.

**Characteristics of Input Devices:**

Several specific tasks are performed using today’s systems:

• To point at an object on the screen.

• To select the object or identify it as the focus of attention.

• To drag an object across the screen.

• To draw something free-form on the screen.

• To track or follow a moving object.

• To orient or position an object.

• To enter or manipulate data or information.

**Types of Input Devices:**

**Based on their mechanism:**

**1. Direct devices:** These are operated on the screen itself. Examples include light

pen, finger and voice.

**2. Indirect devices:** These are operated on locations other than the screen, most often

on desktop. Examples include mouse, trackball and keyboard.

**Based on their action:**

**1. Discrete devices:** used to enter individual bits of information — letters, numbers,

or commands.

**2. Continuous input devices:** operate sequentially in nature— best exemplified by

tasks such as dragging or drawing.

Various input devices include trackball, joystick, graphic tablet, light pen, touch screen,

voice, mouse and keyboard.

**Selecting the Proper Device- Based Controls:**

• Provide keyboards for tasks involving

– Heavy text entry and manipulation

– Movement through structured arrays consisting of few discrete objects

• Provide an alternative pointing device for graphical or drawing tasks

– Mouse: pointing, selecting, drawing, and dragging

– Joystick: selecting and tracking

– Trackball: pointing, selecting and tracking

– Touch screen pointing and selecting

– Graphic tablet pointing selecting, drawing, and dragging

• Provide touch screens under the following conditions

– The opportunity for training is minimal

– Targets are large, discrete and spread out

– Frequency of use is low

– Desk space is at a premium

– Little or no text input requirement exists

• Consider user characteristics and preferences

– Provide keyboards for touch typists

– Minimize eye and hand movements between devices

**Conclusion:**

List all interaction styles which are used in designing of UI.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Program Execution**  **(7)** | **Documentation**  **(2)** | **Punctuality**  **(2)** | **Viva**  **(4)** | **Experiment**  **Marks**  **(15)** | **Teacher**  **Signature**  **with date** |
|  |  |  |  |  |  |