MODULE – 5

SCREEN BASED CONTROLS

Choose the Proper Screen-Based Controls

- Screen-based controls, often simply called *controls* and sometimes called *widgets*, are the elements of a screen that constitute its body.
- By definition, they are graphic objects that represent the properties or operations of other objects. A control may:
    - Permit the entry or selection of a particular value.
    - Permit the changing or editing of a particular value.
    - Display only a particular piece of text, value, or graphic.
    - Cause a command to be performed.
    - Possess a contextual pop-up window.
- Three extremely important principles regarding controls should be noted:
    - A control must:
      Look the way it works.

      Work the way it looks.
    - A control must be used exactly as its design intended.
    - A control must be presented in a standard manner.
- The look of a control should make it obvious that it is a control. Its design characteristics should signal ─enterability‖ or ─clickability.‖ Microsoft Windows, for example, presents the following simple rules:
    - Raised elements can be pressed.
    - Recessed elements cannot be pressed.
   - Elements on a flat white background can be opened, edited, or moved.

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.
- Classes include buttons, text entry/read-only, selection, combination entry/selection, and other specialized controls.

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.

- — Larger size generally provides faster selection target.
    - — Can possess 3-D appearance:
        - • Adds an aesthetically pleasing style to the screen.
        - • Provides visual feedback through button movement when activated.
    - — 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.
- Proper usage:
    - — Use for frequently used actions that are specific to a window.
        - • To cause something to happen immediately.
        - • To display another window.
        - • To display a menu of options.
        - • To set a mode or property value.
- A button comes in three styles.
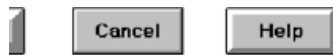
Command buttons.

Toolbar buttons without labels.

Symbol button

Command Buttons

Command button guidelines include the following.

Usage

- For windows with a menu bar:
    - — Use to provide fast access to frequently used or critical commands.
- For windows without a menu bar:
    - — Use to provide access to all necessary commands.

- Give the button a raised appearance.

Str
uct
ure

- Maintain consistency in style throughout an application.

Labels

- Use standard button labels when available.
- Provide meaningful descriptions of the actions that will be performed.
- Use single-word labels whenever possible.
  - — Use two-three words for clarity, if necessary.
- Use mixed-case letters with the first letter of each significant label word capitalized.
- Display labels:
  - — In the regular system font.
  - — In the same size font.
- Do not number labels.

  - Center the label within the button borders, leaving at least two pixels between the text and the button border.
  - Provide consistency in button labeling across all screens.

Size

- Provide as large a button as feasible.
- Maintain consistent button heights and widths.
- Exception: Buttons containing excessively long labels may be wider.
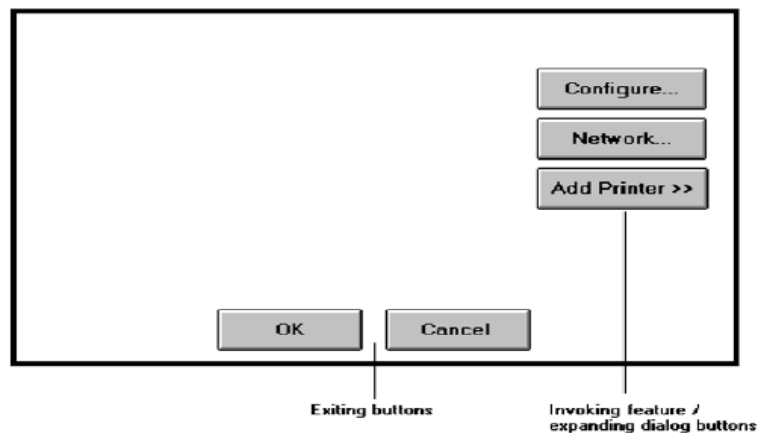
Color Palette >>

OK   Cancel   Help

Number

- Restrict the number of buttons on a window to six or fewer.

Location and Layout

- Maintain consistency in button location between windows.
- Never simply ―fit‖ buttons in available space.
- If buttons are for exiting the dialog:
  - — Position them centered and aligned horizontally at the bottom.
- If buttons are used for invoking a dialog feature or expanding the dialog:
  - — Position them centered and aligned vertically on the right side.
- If a button has a contingent relationship to another control:
  - — Position it adjacent to the related control.
- If a button has a contingent relationship to a group of controls:
  - — Position it at the bottom or to right of related controls.
- If, due to space constraints, exiting and expanding/invoking feature buttons must be placed together:
  - — If at the bottom, place exiting buttons to the right, separating the groupings by one button's width.
  - — If along the right side, place exiting buttons at the bottom, separating the groupings by one button's height.
- For exiting and expanding/invoking feature buttons, do not:
  - — Align with the other screen controls.
  - — Present displayed within a line border.
- Provide equal and adequate spacing between adjacent buttons.
- Provide adequate spacing between buttons and the screen body controls.

Configure...

Network...

Add Printer >>

OK   Cancel

Exiting buttons   Invoking feature / expanding dialog buttons

- Restrict the number of buttons on a window o

Organization

- Organize standard buttons in the manner recommended by the platform being used.
- For other buttons, organize them in common and customary grouping schemes.
  - — For buttons ordered left to right, place those for most frequent actions to the left.
  - — For buttons ordered top to bottom, place those for most frequent actions at the top.

Location and

- Keep related buttons grouped together.
- Separate potentially destructive buttons from frequently chosen selections.
- Buttons found on more than one window should be consistently positioned.
- The order should never change.
- For mutually exclusive actions, use two buttons; do not dynamically change the text.
- Windows recommends the following:
    - An affirmative action to the left (or above).
    - The default first.
    - OK and Cancel next to each other.
    - Help last, if supported.

Intent Indicators

- When a button causes an action to be immediately performed, no intent indicator is necessary.

- When a button leads to a cascading dialog, include an ellipsis (...) after the label.
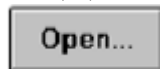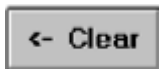

- When a button leads to a menu, include a triangle pointing in the direction the menu will appear after the label.

- When a button leads to an expanding dialog, include a double arrow (>>) with the label.

- When a button has a contingent relationship to another control that must be indicated, include a single arrow (->) pointing at

    the control.

Expansion Buttons

- Gray them out after expansion.
- Provide a contraction button, if necessary.
    — Locate it beneath, or to right of, the expansion button.
    — Gray it out when not applicable.

Defaults

- Intent:

- Selection:
  - A default should be the most likely action:
    - • A confirmation.
    - • An application of the activity being performed.
    - • A positive action such as OK, unless the result is catastrophic.
  - If a destructive action is performed (such as a deletion), the default should be Cancel.
- Presentation:
  - Indicate the default action by displaying the button with a bold or double border.
- Procedures:
  - The default can be changed as the user interacts with the window.
  - When the user navigates to a button, it can temporarily become the default.
  - Use the Enter key to activate a default button.
  - If another control requires use of the Enter key, temporarily disable the default while the focus is on the other control.
  - Permit double-clicking on a single selection control in a window to also carry out the default command.

Unavailable Choices

- Temporarily unavailable choices should be dimmed or grayed out.

Keyboard Equivalents and Accelerators

- Equivalents:
  - Assign a keyboard equivalent mnemonic to each button to facilitate keyboard selection.
  - The mnemonic should be the first character of the button's label.
    - • If duplication exists in first characters, for duplicate items, use another character in the label.
    - • Preferably, choose the first succeeding consonant.
  - Designate the mnemonic character by underlining it.
  - Maintain the same mnemonic on all identical buttons on other

Apply

  - screens.
- Accelerators:
  - Assign a keyboard accelerator to each button to facilitate keyboard selection.

Scrolling

- If a window can be scrolled, do not scroll the command buttons.
  - Exception: if the screen cannot scroll independently of the buttons.
- Use buttons to move between multipage forms, not scroll bars.
  - Label buttons Next and Previous.

Button Activation

Pointing:

— H when the pointer is resting on it and the button is available for
selection.

Activation:
— Call attention to the button in another visually distinctive manner when it has been activated or pressed.
— If a button can be pressed continuously, permit the user to hold the mouse button down and repeat the action.

Toolbars

- *Toolbars* are compilations of commands, actions, or functions, usually graphical in structure but sometimes textual, grouped together for speedy access.
- Toolbars may also be called *button bars*, *control bars,* or *access bars*. Specialized toolbars may also be referred to as *ribbons*, *toolboxes*, or *palettes*. Toolbars may also appear in palette windows.

Usage

- To provide easy and fast access to most frequently used commands or options across multiple screens.
- To invoke a sub application within an application.
- To use in place of certain menu items.

Highlight the button to pin some visually distinctive manner

Structure
- Images:
  — Provide buttons of equal size.
  — Create a meaningful and unique icon.
  - • Design them using icon design guidelines.
  — Center the image within the button.
  — Give the button a raised appearance.
  — Ensure that toolbar images are discernible from Web page graphical images.
- Text:
  — Create a meaningful label, adhering to label guidelines for command buttons.
  — Create toolbar buttons of equal size, following the size guidelines recently described.
- Consistency:
  — Use the same icon throughout an application and between applications.

Size

- Button:
  — 24 (w) by 22 (h) pixels, including border.
  — 32 (w) by 30 (h) pixels, including border.
  — Larger buttons can be used on high-resolution displays.
- Label:
  — 16 (w) by 16 (h) pixels.
  — 14 (w) by 24 (h) pixels.
- Default:
  — Provide the smaller size as the default size with a user option to change it.
- Image:
  — Center the image in the button.

Organization
- Order the buttons based on common and customary grouping schemes.
  — For buttons ordered left to right, place those for the most frequently used actions to the left.
  — For buttons ordered top to bottom, place those for the most frequently used actions at the top.
- Keep related buttons grouped together.
- Separate potentially destructive buttons from frequently chosen selections.
- Permit user reconfiguration of button organization.

Location
- Position main features and functions bar horizontally across top of window just below menu bar.
- Position subtask and sub features bars along sides of window.
- Permit the location of the bar to be changed by the user.
- Permit display of the bar to be turned on or off by the user.
  — Also provide access through standard menus.

Active Items

☐ Make only currently available toolbar items available.

☐ Temporarily not available items may be displayed grayed out.

Customization

☐ Permit toolbars to be turned off by the user.

☐ Allow the customizing of toolbars.

— Provide a default, however.

Keyboard Equivalents and Accelerators

☐ Equivalents:

— Assign keyboard equivalents to facilitate keyboard selection.

— Maintain the same mnemonic on all identical buttons on all screens.

☐ Accelerators:

— Assign a keyboard accelerator to facilitate keyboard selection.

Button Activation

☐ Pointing:

— Highlight the button in some visually distinctive manner when the pointer is resting on it and the button is available for selection.

☐ Activation:

— Call attention to the button in another visually distinctive manner when it has been activated or pressed.

Text Entry/Read-Only Controls

☐ A Text Entry/Read-Only control contains text that is exclusively entered or modified through the keyboard.

☐ It may also contain entered text being presented for reading or display purposes only.

Text Boxes

☐ Description:

— A control, usually rectangular in shape, in which:

• Text may be entered or edited.

• Text may be displayed for read-only purposes.

— Usually possesses a caption describing the kind of information contained within it.

— An outline field border:

• Is included for enterable/editable text boxes.

• Is not included for read-only text boxes.

— Two types exist:

- • Single line.
    - • Multiple line.
- — When first displayed, the box may be blank or contain an initial value.
- ☐ Purpose:
    - — To permit the display, entering, or editing of textual information.
    - — To display read-only information.
- ☐ Advantages:
    - — Very flexible.
    - — Familiar.
    - — Consumes little screen space.
- ☐ Disadvantages:
    - — Requires use of typewriter keyboard.
    - — Requires user to remember what must be keyed.
- ☐ Proper usage:
    - — Most useful for data that is:
        - • Unlimited in scope.
        - • Difficult to categorize.
        - • Of a variety of different lengths.
    - — When using a selection list is not possible.

Types of text box

- ☐ Two types of *text boxes* exist. One consists of a rectangular box into which information is typed. It may also be referred to as an *edit* control.
- ☐ The second is also rectangular in shape but contains text displayed purely for read-only purposes. The former type has historically been referred to as an *entry field*, the latter as an *inquiry* or *display field*.

Entry/Modification: Information

Display/Read Only: Information

Two forms of Text Box
Single-Line and Multiple-Line Text Boxes

- ☐ Single line:
    - — Description:
        - • A control consisting of no more than one line of text.
    - — Purpose:
        - • To make textual entries when the information can be contained within one line of the screen.
    - — Typical uses:
        - • Typing the name of a file to save.
        - • Typing the path of a file to copy.
        - • Typing variable data on a form.
        - • Typing a command.
- ☐ Multiple line:
    - — Description:
        - • A control consisting of a multiline rectangular box for multiple

lines of text.

— Purpose:

• To type, edit, and read passages of text.

— Typical uses:

• Creating or reading an electronic mail message.

• Displaying and editing text files.

Captions

☐ Structure and size:

— Provide a descriptive caption to identify the kind of information to be typed, or contained 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.

Composition: [   ]

— Place a colon (:) immediately following the caption.

— Position above the upper-left corner of the box, flush with the left edge.

— Multiple occurrence fields:

Composition:

[   ]

• For entry/modification text boxes:

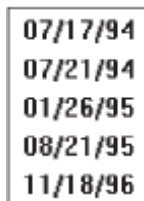— Position the caption left-justified one line above the column of entry fields.

Offices:

[   ]

[   ]

• For display/read-only boxes:

— If the data field is long and fixed-length, or the displayed data is about the same length, center the caption above the displayed text box data.

Date:

| 07/17/94 |
| 07/21/94 |
| 01/26/95 |
| 08/21/95 |
| 11/18/96 |

— If the data displayed is alphanumeric, short, or quite variable in length, left-justify the caption above the displayed text box data.

Location:

| Alice Springs |
| Kakadu National Park |
| Traralgon |
| Wagga Wagga |
| Whyalla |

— If the data field is numeric and variable in length, right-justify the caption above the displayed text box data.

Balances:

| 12,642,123.05 |
| 53.98 |
| 355,125.44 |
| 199.13 |
| 612.01 |

Fields

☐ Structure:
— Identify entry/modification text boxes with a line border or reverse polarity rectangular box.
  • To visually indicate that it is an enterable field, present the box in a recessed manner.
  • Present display/read-only text boxes on the window background.
—Break up long text boxes through incorporation of slashes (/), dashes (-), spaces, or other common delimiters.

Date: ☐ ☐ ☐

Telephone: ☐ ☐ ☐

Date: [/   /   ]

Telephone: [(   )   -   ]

☐ Size:
— Size to indicate the approximate length of the field.
— Text boxes for fixed-length data must be large enough to contain the entire entry.
— Text boxes for variable-length data must be large enough to contain the majority of the entries.
— Where entries may be larger than the entry field, scrolling must be provided to permit keying into, or viewing, the entire field.
— Employ word wrapping for continuous text in multiple-line text boxes.

☐ Highlighting:
— Call attention to text box data through a highlighting technique.
  • Higher intensity.

- If color is used, choose one that both complements the screen background and contrasts well with it.
☐ Unavailable fields:
— Gray-out temporarily unavailable text boxes.
☐ Fonts:
— To support multiple fonts, use a *Rich-Text Box*.

Selection Controls

☐ A selection control presents on the screen all the possible alternatives, conditions, or choices that may exist for an entity, property, or value.
☐ The relevant item or items are selected from those displayed.
☐ Selection controls include radio buttons, check boxes, list boxes, drop-down/pop-up list boxes, and palettes.

1. 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.
☐ Disadvantages:
— Consume screen space.
— Limited number of choices.
☐ Proper usage:
— For setting attributes, properties, or values.
— For mutually exclusive choices (that is, only one can be selected).
— Where adequate screen space is available.
— Most useful for data and choices that are:
• Discrete.
• Small and fixed in number.
• Not easily remembered.
• In need of a textual description to meaningfully describe the alternatives.
• Most easily understood when the alternatives can be seen together and compared to one another.
• Never changed in content.

— Do not use:
- For commands.
- Singly to indicate the presence or absence of a state.
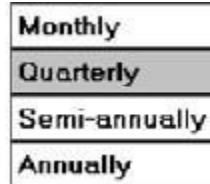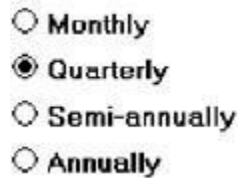
Choice Descriptions
- Provide meaningful, fully spelled-out choice descriptions clearly describing the values or effects set by the radio buttons.
- Display in a single line of text.
- Display using mixed-case letters, using the sentence style.
- Position descriptions to the right of the button. Separate them by at least one space from the button.
- When a choice is conditionally unavailable for selection, display the choice description grayed out or dimmed.
- Include a none choice if it adds clarity.

Size
- Show a minimum of two choices, a maximum of eight.

Defaults
- When the control possesses a state or affect that has been predetermined to have a higher probability of selection than the others, designate it as the default and display its button filled in.
- When the control includes choices whose states cannot be predetermined, display all the buttons without setting a dot, or in the *indeterminate* state.
- When a multiple selection includes choices whose states vary, display the buttons in another unique manner, or in the *mixed value* state.

Structure
- A columnar orientation is the preferred manner of presentation.
- Left-align the buttons and choice descriptions.
- If vertical space on the screen is limited, orient the buttons horizontally.
- Provide adequate separation between choices so that the buttons are associated with the proper description.
  — A distance equal to three spaces is usually sufficient.
- Enclose the buttons in a border to visually strengthen the relationship they possess.
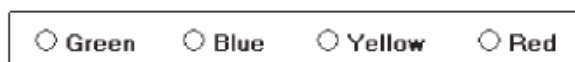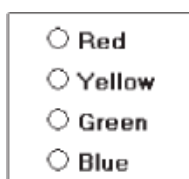
Still Better

Best

Organization

- ☐ Arrange selections in expected order or follow other patterns such as frequency of occurrence, sequence of use, or importance.
  — For selections arrayed top to bottom, begin ordering at the top.
  — For selections arrayed left to right, begin ordering at the left.
- ☐ If, under certain conditions, a choice is not available, display it subdued or less brightly than the available choices.

Related Control

- ☐ Position any control related to a radio button immediately to the right of the choice description.
- ☐ If the radio button choice description also acts as the label for the control that follows it, end the label with an arrow (>).

Captions

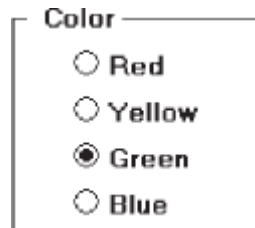- ☐ Structure:
  — Provide a caption for each radio button control.
    - • Exception: In screens containing only one radio button

control, the screen title may serve as the caption.

☐ Display:
— Fully spelled out.
— In mixed-case letters, capitalizing the first letter of all significant words.

☐ Columnar orientation:
— With a control border, position the caption:
  • Upper-left-justified within the border.

```
┌ Color ──────────────┐
│   ○ Red             │
│   ○ Yellow          │
│   ◉ Green           │
│   ○ Blue            │
└─────────────────────┘
```

  • Alternately, the caption may be located to the left of the topmost choice description.
— Without an enclosing control border, position the caption:
  • Left-justified above the choice descriptions, separated by one space line.

```
Color:

◉ Red
○ Yellow
○ Green
○ Blue
```

  • Alternately, the caption may be located to the left of the topmost choice description.

```
Color:   ○ Red
         ○ Yellow
         ◉ Green
         ○ Blue
```

☐ Horizontal orientation:
— Position the caption to the left of the choice descriptions.

```
Color:   ○ Green   ○ Blue   ○ Yellow   ○ Red
```

  • Alternately, with an enclosing control border, left-justified within the border.

```
┌ Color ────────────────────────────────────┐
│   ○ Green   ○ Blue   ○ Yellow   ◉ Red     │
└────────────────────────────────────────────┘
```

— Be consistent in caption style and orientation within a screen.

Keyboard Equivalents

☐ Assign a keyboard mnemonic to each choice description.

```
◉ Red
```

☐ Designate the mnemonic by underlining the applicable letter in the

choice description.

Selection Method and Indication

☐ Pointing:
— The selection target area should be as large as possible.
  • Include the button and the choice description text.
  — Highlight the selection choice in some visually distinctive way
  when the cursor's resting on it and the choice is available for selection.
      • This cursor should be as long as the longest choice description
      plus one space at each end. Do not place the cursor over the small

      ○ Red
      ○ Yellow
      ○ Green
      ○ Blue

  button.
☐ Activation:
  — When a choice is selected, distinguish it visually from the unselected choices.
      • A radio button should be filled in with a solid dark dot or made to
      look depressed or higher through use of a shadow.
  — When a choice is selected, any other selected choice must be deselected.
☐ Defaults:
  — If a radio button control is displayed that contains a choice previously
  selected or a default choice, display the selected choice as set in the control.

2. 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.
      • Used alone or grouped in sets.
☐ Purpose:
  — To set one or more options as either on or off.
☐ Advantages
  — Easy-to-access choices.
  — Easy-to-compare choices.
  — Preferred by users.
☐ Disadvantages:

      — Consume screen space.

      — Limited number of choices.

      — Single check boxes difficult to align with other screen controls.

☐ Proper usage:

      — For setting attributes, properties, or values.

      — For nonexclusive choices (that is, more than one can be selected).

      — Where adequate screen space is available.

      — Most useful for data and choices that are:

            • Discrete.

            • Small and fixed in number.

            • Not easily remembered.

            • In need of a textual description to describe meaningfully.

            • Most easily understood when the alternatives can be seen together and compared to one another.

            • Never changed in content.

    — Can be used to affect other controls.

    — Use only when both states of a choice are clearly opposite and unambiguous.
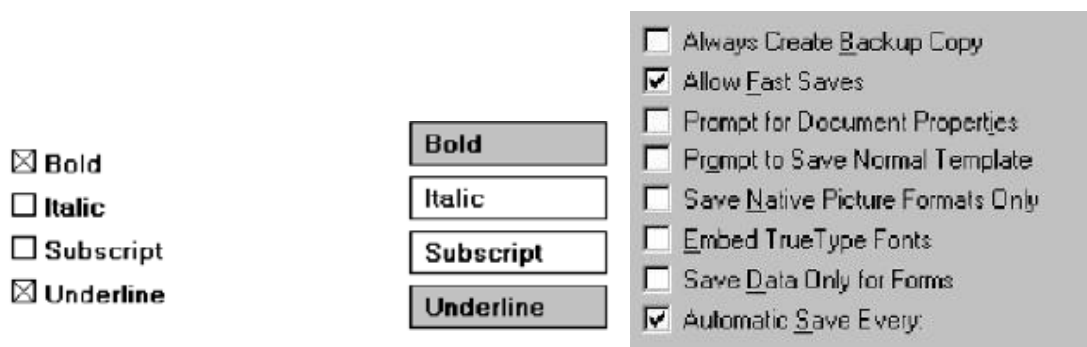
Choice Descriptions

☐ Provide meaningful, fully spelled-out choice descriptions clearly describing the values or effects set by the check boxes.

☐ Display them in a single line of text.

☐ Display them using mixed-case letters in sentence style.

☐ Position descriptions to the right of the check box. Separate by at least one space from the box.

☐ When a choice is unavailable for selection under a certain condition, display the choice description visually dimmed.

Size

☐ Show a minimum of one choice, a maximum of eight.

Defaults

☐ When the control possesses a state or affect that has been preset, designate it as the default and display its check box marked.

☐ When a multiple selection includes choices whose states vary, display the buttons in another unique manner, or the *mixed value* state.

Structure

☐ Provide groupings of related check boxes.
☐ A columnar orientation is the preferred manner of presentation for multiple related check boxes.
☐ Left-align the check boxes and choice descriptions.
☐ If vertical space on the screen is limited, orient the boxes horizontally.
☐ Provide adequate separation between boxes so that the buttons are associated with the proper description.
— A distance equal to three spaces is usually sufficient.
☐ Enclose the boxes in a border to visually strengthen the relationship they possess.

Organization

☐ Arrange selections in logical order or follow other patterns such as frequency of occurrence, sequence of use, or importance.
— For selections arrayed top to bottom, begin ordering at the top.
— For selections arrayed left to right, begin ordering at the left.
☐ If, under certain conditions, a choice is not available, display it subdued or less brightly than the available choices.

Related Control

☐ Position any control related to a check box immediately to the right of the choice description.
— If a the check box choice description also acts as the label for the control that follows it , end the label with an arrow (>).

Captions and Keyboard Equivalents

Same as Radio Button

Selection Method and Indication

☐ Pointing:
— The selection target area should be as large as possible.
• Include the check box and the choice description text.
— Highlight the selection choice in some visually distinctive way when the cursor's resting on it and the choice is available for selection.
• This cursor should be as long as the longest choice description plus one space at each end. Do not place the cursor over the check box.

☐ Activation:
— When a choice is selected, distinguish it visually from the non-selected choices.
• A check box should be filled in or made to look depressed or higher through use of a shadow.
☐ Defaults:

— If a check box is displayed that contains a choice previously selected or default choice, display the selected choice as set in the control.

☐ Select/deselect all:
— Do not use *Select All* and *Deselect All* check boxes.

☐ Mixed-value state:
— When a check box represents a value, and a multiple selection encompasses multiple value occurrences set in both the on and off state, display the check box in a *mixed value* state.

■ Bold
☐ Italic
☐ Underline

• Fill the check box with another easily differentiable symbol or pattern.

— Toggle the check box as follows:
• Selection 1: Set the associated value for all elements. Fill the check box with an ‒X‖ or ‒check.‖
• Selection 2: Unset the value for all associated elements. Blank-out the check box.
• Selection 3: Return all elements to their original state. Fill the check box with the mixed value symbol or pattern.

3. **Palettes**

☐ Description:
— A control consisting of a series of graphical alternatives. The choices themselves are descriptive, being composed of colors, patterns, or images.
— In addition to being a standard screen control, a palette may also be presented on a pull-down or pop-up menu or a toolbar.
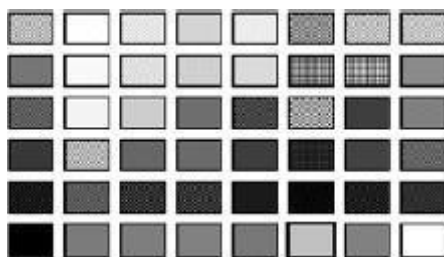
☐ Purpose:
— To set one of a series of mutually exclusive options presented graphically or pictorially.

☐ Advantages:
— Pictures aid comprehension.
— Easy-to-compare choices.
— Usually consume less screen space than textual equivalents.

☐ Disadvantages:
— A limited number of choices can be displayed.
— Difficult to organize for scanning efficiency.

— Requires skill and time to design meaningful and attractive graphical representations.
- Proper usage:
    - For setting attributes, properties, or values.
    - For mutually exclusive choices (that is, only one can be selected).
    - Where adequate screen space is available.
    - Most useful for data and choices that are:
        - Discrete.
        - Frequently selected.
        - Limited in number.
        - Variable in number.
        - Not easily remembered.
        - Most easily understood when the alternatives may be seen together and compared to one another.
        - Most meaningfully represented pictorially or by example.
        - Can be clearly represented pictorially.
        - Rarely changed in content.
    - Do not use:
        - Where the alternatives cannot be meaningfully and clearly represented pictorially.
        - Where words are clearer than images.
        - Where the choices are going to change.

Graphical Representations
- Provide meaningful, accurate, and clear illustrations or representations of choices.
- Create images large enough to:
    - Clearly illustrate the available alternatives.
    - Permit ease in pointing and selecting.
- Create images of equal size.
- Always test illustrations before implementing them.

Size

- Present all available alternatives within the limits imposed by:
    - The size of the graphical representations.
    - The screen display's capabilities.

Layout

- Create boxes large enough to:
    - Effectively illustrate the available alternatives.
    - Permit ease in pointing and selecting.
- Create boxes of equal size.
- Position the boxes adjacent to, or butted up against, one another.
- A columnar orientation is the preferred manner.
- If vertical space on the screen is limited, orient the choices horizontally.

Organization

Arrange palettes in expected or normal order.
  — For palettes arrayed top to bottom, begin ordering at the top.
  — For palettes arrayed left to right, begin ordering at the left.
 If an expected or normal order does not exist, arrange choices by frequency of occurrence, sequence of use, importance, or alphabetically (if textual).
 If, under certain conditions, a choice is not available, display it subdued or less brightly than the other choices.

Captions

 Provide a caption for each palette.
  — On screens containing only one palette, the screen title may serve as the caption.
 Display the caption fully spelled out using mixed-case letters.
 Columnar orientation:
  — The field caption may be positioned left-aligned above the palette.
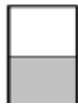
Shade:

  — Alternately, the caption may be positioned to the left of the topmost alternative.

Shade:
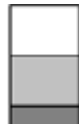
 Horizontal orientation:
  — The field caption may be positioned above the palette.

Shade:

 — Alternately, the caption may be positioned to the left of the alternatives.

Shade:

Selection Method and Indication

 Pointing:
  — Highlight the choice in some visually distinctive way when the pointer or cursor is resting on it and the choice is available for selection.
 Activation:
  — When a choice is selected, distinguish it visually from the unselected choices by highlighting it in a manner different from when it is pointed at, or by placing a bold border around it.
 Defaults:
  — If a palette is displayed with a choice previously selected or a default choice, display the currently active choice in the manner used when it was selected.

List Boxes

- 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 may be associated with a *summary list box* control, which allows the selected choice to be displayed or an item added to the list.
- Purpose:
  — To display a collection of items containing:
  - • Mutually exclusive options.
  - • Non-mutually-exclusive options.
- Advantages:
  — Unlimited number of choices.
  — Reminds users of available options.
  — Box always visible.
- Disadvantages:
  — Consumes screen space.
  — Often requires an action (scrolling) to see all list choices.
  — The list content may change, making it hard to find items.
  — The list may be ordered in an unpredictable way, making it hard to find items.
- Proper usage:
  — For selecting values or setting attributes.
  — For choices that are:
  - • Mutually exclusive (only one can be selected).
  - • Non-mutually-exclusive (one or more may be selected).
  — Where screen space is available.
  — For data and choices that are:
  - • Best represented textually.
  - • Not frequently selected.
  - • Not well known, easily learned, or remembered.
  - • Ordered in an unpredictable fashion.
  - • Frequently changed.
  - • Large in number.
  - • Fixed or variable in list length.

  — When screen space or layout considerations make radio buttons or check boxes impractical.
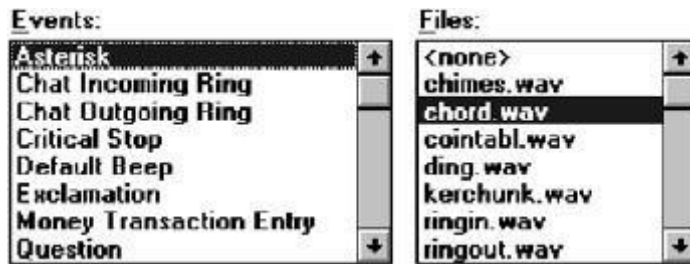
4. List Box General

Guidelines Selection

Descriptions

- ☐ Clearly and meaningfully describe the choices available. Spell them out as fully as possible.
  — Graphical representations must clearly represent the options.
- ☐ Present in mixed case, using the sentence style structure.
- ☐ Left-align into columns.

List Size

- ☐ Not actual limit in size.
- ☐ Present all available alternatives.
- ☐ Require no more than 40 page-downs to search a list.
  — If more are required, provide a method for using search criteria or scoping the options.

Box Size

- ☐ Must be long enough to display 6 to 8 choices without requiring scrolling.
  — Exceptions:
  • If screen space constraints exist, the box may be reduced in size to display at least three   items.
  • If it is the major control within a window, the box may be larger.
  — If more items are available than are visible in the box, provide vertical scrolling to display all   items.

☐ Must be wide enough to display the longest possible choice.

— When box cannot be made wide enough to display the longest entry:
• Make it wide enough to permit entries to be distinguishable, or,
• Break the long entries with an ellipsis (...) in the middle, or,
• Provide horizontal scrolling.

Organization

☐ Order in a logical and meaningful way to permit easy browsing.
— Consider using separate controls to enable the user to change the sort order or filter items displayed in the list.
☐ If a particular choice is not available in the current context, omit it from the list.
— Exception: If it is important that the existence and unavailability of a particular list item be communicated, display the choice dimmed or grayed out instead of deleting it.

Layout and Separation

☐ Enclose the choices in a box with a solid border.
— The border should be the same color as the choice descriptions.
☐ Leave one blank character position between the choice descriptions and the left border.
☐ Leave one blank character position between the longest choice description in the list and the right border, if possible.

Captions

☐ Use mixed-case letters.
☐ The preferred position of the control caption is above the upper-left corner of the list box.

☐ Alternately, the caption may be located to the left of the topmost choice description.

☐ Be consistent in caption style and orientation within a screen, and related screens.

Disabling

☐ When a list box is disabled, display its caption and show its entries as grayed out or dimmed.

Selection Method and Indication

☐ Pointing:
— Highlight the selection choice in some visually distinctive way when the pointer or cursor is resting on it and the choice is available for selection.
☐ Selection:
— Use a reverse video or reverse color bar to surround the choice description when it is selected.
— The cursor should be as wide as the box itself.

— Mark the selected choice in a distinguishing way.
☐ Activation:
— Require the pressing of a command button when an item, or items, is selected.

Single-Selection List Boxes

☐ Purpose:
— To permit selection of only one item from a large listing.
☐ Design guidelines:
— Related text box

• If presented with an associated text box control:

— Position the list box below and as close as possible to the text box.

— The list box caption should be worded similarly to the text box caption.
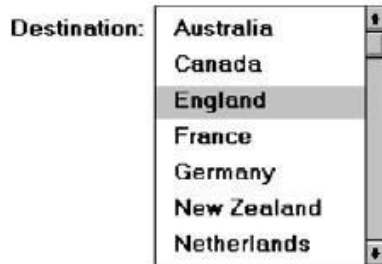
— If the related text box and the list box are very close in proximity, the caption may be omitted from the list box.

— Use the same background color for the text box as is used in the list box.

☐ Defaults:

• When the list box is first displayed:

— Present the currently active choice highlighted or marked with a circle or d diamond to the left of the entry.

— If a choice has not been previously selected, provide a default choice and display it in the same manner that is used in selecting it.

— If the list represents mixed values for a multiple selection, do not highlight an entry.

☐ Other:

—Follow other relevant list box guidelines.

**Extended and Multiple-Selection List Boxes**

☐ Purpose:

— To permit selection of more than one item in a long listing.

  • Extended list box: Optimized for individual item or range selection.

  • Multiple-selection list box: Optimized for independent item selection.

☐ Design guidelines:

— Selection indication:

  • Mark the selected choice with an X or check mark to the left of the entry.

• Consider providing a *summary list box*.
— Position it to the right of the list box.
— Use the same colors for the summary list box as are used in the list box.
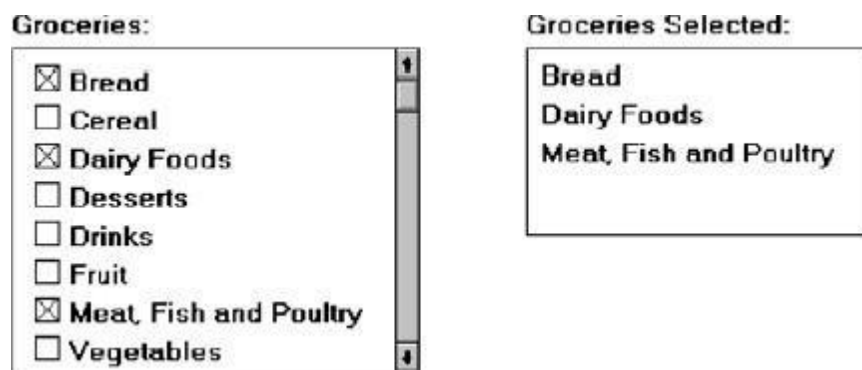
— Provide command buttons to *Add* (one item) or *Add All* (items) to the summary list box, and *Remove* (one item) or *Remove All* (items) from the summary list box.

☐ Consider providing a display-only text control indicating how many choices have been selected.
— Position it justified upper-right above the list box.

— Select all and Deselect All buttons
— Provide command buttons to accomplish fast *Select All* and *Deselect All* actions, when these actions must be frequently or quickly performed.
— Defaults:
   • When the list box is first displayed:
   — Display the currently active choices highlighted.
   — Mark with an X or check mark to the left of the entry.

   — If the list represents mixed values for a multiple selection,

do not highlight an entry.
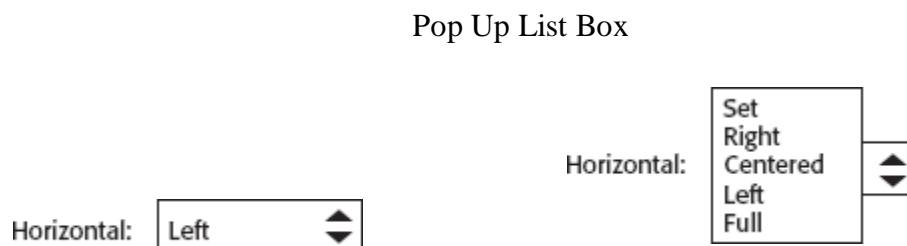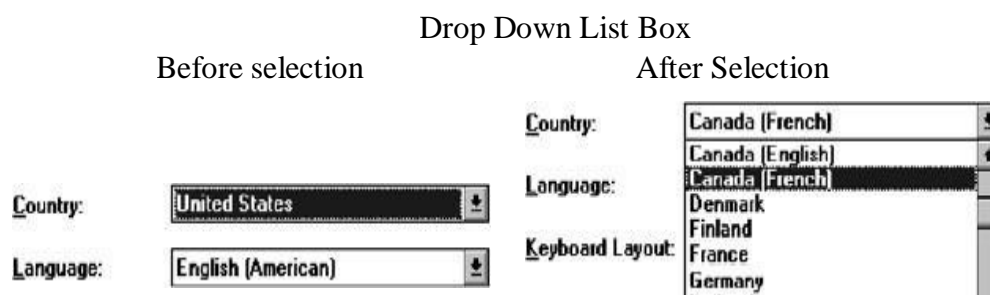— Other:
  • Follow other relevant list box guidelines.

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.
    — Leftmost column includes icon and its label.
    — Subsequent columns include application-specific information.

☐ Purpose and usage:
— Where the representation of objects as icons is appropriate.
— To represent items with multiple columns of information.

5. Drop-down/Pop-up List Boxes

☐ Description
— A single rectangular control that shows one item with a small button to the right side.
  • The button provides a visual cue that an associated selection box is available but hidden.
— When the button is selected, a larger associated box appears, containing a list of choices from which one may be selected.
— Selections are made by using the mouse to point and click.
— Text may not be typed into the control.

☐ Purpose:
— To select one item from a large list of mutually exclusive options when screen space is limited.

☐ Advantages:
— Unlimited number of choices.
— Reminds users of available options.
— Conserves screen space.

☐ Disadvantages:
— Requires an extra action to display the list of choices.
— When displayed, all choices may not always be visible, requiring scrolling.
— The list may be ordered in an unpredictable way, making it hard to find items.

☐ Proper usage:
— For selecting values or setting attributes.
— For choices that are mutually exclusive (only one can be selected).
— Where screen space is limited.

— For data and choices that are:
- Best represented textually.
- Infrequently selected.
- Not well known, easily learned, or remembered.
- Ordered in a unpredictable fashion.
- Large in number.
- Variable or fixed in list length.

— Use drop-down/pop-up lists when:
- Screen space or layout considerations make radio buttons or single- selection list boxes impractical.
- The first, or displayed, item will be selected most of the time.

— Do not use a drop-down list if it important that all options be seen together.

Drop Down List Box

Before selection   After Selection

Pop Up List Box

Prompt Button

☐ Provide a visual cue that a box is hidden by including a downward pointing arrow, or other meaningful image, to the right side of the selection field.
— Position the button directly against, or within, the selection field.

Selection Descriptions

☐ Clearly and meaningfully describe the choices available. Spell them out as fully as possible.
— Graphical representations must clearly represent the options.
— Left-align them in columns.
— Display the descriptions using mixed-case letters.

List Size
☐ Not limited in size.
☐ Present all available alternatives.

Box Size

☐ Long enough to display 6 to 8 choices without scrolling.
— If more than eight choices are available, provide vertical scrolling to display all items.
☐ Wide enough to display the longest possible choice.
☐ When a box cannot be made wide enough to display the longest entry:
— Make it wide enough to permit entries to be distinguishable, or,
— Break long entries with ellipses (...) in the middle, or,
— Provide horizontal scrolling.

Organization

☐ Order in a logical and meaningful way to permit easy browsing.
☐ If a particular choice is not available in the current context, omit it from the list.
— Exception: If it is important that the existence and unavailability of a particular list item be communicated, display the choice dimmed or grayed out instead of deleting it.

Layout and Separation

☐ Enclose the choices in a box composed of a solid line border.
— The border should be the same color as the choice descriptions.
— Leave one blank character position between the choices and the left border.
— Leave one blank character position between the longest choice description in the list and the right border, if possible.

Captions

☐ Display using mixed-case letters.
☐ Position the caption to the left of the box.
— Alternately, it may be positioned left-justified above the box.

Defaults

☐ When the drop-down/pop-up listing is first presented, display the currently set value.
☐ If a choice has not been previously selected, provide a default choice.

Disabling

☐ When a drop-down/pop-up list box is disabled, display its caption and entries as disabled or dimmed.

Selection Method and Indication

☐ Pointing:
— Highlight the selection choice in some visually distinctive way when the pointer or cursor is resting on it and the choice is available for selection.
☐ Activation:
— Close the drop-down/pop-up list box when an item is selected.

Combination Entry/Selection Controls

☐ It is possible for a control to possess the characteristics of both a text field and a selection field.

☐ The types of combination entry/selection fields are spin boxes, attached combination boxes, and drop-down/pop-up combination boxes.

        • Selections are made by using a mouse to point and click.

— As text is typed into the text box, the list scrolls to the nearest match.

— When an item in the list box is selected, it is placed into the text box, replacing the existing content.

— Information keyed may not necessarily have to match the list items.

☐ Purpose:

— To allow either typed entry in a text box or selection from a list of options in a permanently displayed list box attached to the text box.

☐ Advantages:

— Unlimited number of entries and choices.

— Reminds users of available options.

— Flexible, permitting selection or typed entry.

— Entries not necessarily restricted to items selectable from list box.

— List box always visible.

☐ Disadvantages:

— Consumes some screen space.

— All list box choices not always visible, requiring scrolling.

— Users may have difficulty recalling sufficient information to type entry, making text box unusable.

— The list may be ordered in an unpredictable way, making it hard to find items.

☐ Proper usage:

— For entering or selecting objects or values or setting attributes.

— For information that is mutually exclusive (only one can be entered or selected).

— When users may find it practical to, or prefer to, type information rather than selecting it from a list.

— When users can recall and type information faster than selecting it from a list.

— When it is useful to provide the users a reminder of the choices available.

— Where data must be entered that is not contained in the selection list.

— Where screen space is available.

— For data and choices that are:

        • Best represented textually.

        • Somewhat familiar or known.

        • Ordered in an unpredictable fashion.

        • Frequently changed.

        • Large in number.

        • Variable or fixed in list length.

Custom Controls

☐ Implement custom controls with caution.
☐ If used, make the look and behavior of custom controls different from that of standard controls.

Presentation Controls

☐ Common presentation controls are *static text fields, group boxes column headings, ToolTips, balloon tips,* and *progress indicators*.

1. Static Text Fields

☐ Description:
  — Read-only textual information.
☐ Purpose:
  — To identify a control by displaying a control caption.
  — To clarify a screen by providing instructional or prompting information.
  — To present descriptive information.
☐ Proper usage:
  — To display a control caption.
  — To display instructional or prompting information.
  — To display descriptive information.

Static Text Field Guidelines

☐ Captions:
  — Include a colon (:) as part of the caption.
  — Include a mnemonic for keyboard access.
  — When the associated control is disabled, display it dimmed.
  — Follow all other presented guidelines for caption presentation and layout.

☐ Instructional or prompting information:
  — Display it in a unique and consistent font style for easy recognition and differentiation.
  — Follow all other presented guidelines for prompting and instructional information.
☐ Descriptive information:
  — Follow all other guidelines for required screen or control descriptive information.

2. 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.
• Provide a brief label or heading, preferably 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 and ending colon (:).
— Follow all other guidelines presented for control and section borders.

Sizing Grid		
Granularity:	0	▲▼
Border Width:	3	▲▼

Group Box

3. Column Headings

☐ Description:
— Read-only textual information that serves as a heading above columns of text or numbers.
— Can be divided into two or more parts.
☐ Purpose:
— To identify a column of information contained in a table.
☐ Proper usage:
— To display a heading above a column of information contained in a table.
☐ Guidelines:
— Heading:
• Provide a brief heading.
• Can include text and a graphic image.

• Capitalize the first letter of each significant word.
• Do not include an ending colon (:).
— The width of the column should fit the average size of the column entries.
— Does not support keyboard access.

Name ▲	Size
diff bwn udf and sp.doc	31 KB
EXAM-700.rar	2,114 KB
EXAM-703.rar	690 KB
Fundamentals of Stored Proc...	195 KB
IBMMAINFRAMES.zip	2,177 KB
Message001.eml	3,062 KB
PROC_LIB.zip	87 KB
triggers.rtf	18 KB
udfs.doc	48 KB

4. ToolTips

- Description:
  — A small pop-up window containing descriptive text that appears when a pointer is moved over a control or element either:
  - Not possessing a label.
  - In need of additional descriptive or status information.
- Purpose:
  — To provide descriptive information about a control or screen element.
- Advantages:
  — Identifies an otherwise unidentified control.
  — Reduces possible screen clutter caused by control captions and descriptive information.
  — Enables control size to be reduced.
- Disadvantages:
  — Not obvious, must be discovered.
  — Inadvertent 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.

ToolTip Guidelines

- Display after a short time-out.
- For toolbars, provide a brief word as a label.
  — Use mixed case in the headline style of presentation with no ending punctuation.
- For other elements, provide a brief phrase presenting descriptive or status information.
— Use mixed case in the sentence style of presentation.
- Present ToolTips at the lower-right edge of the pointer.
  — Display them fully on the screen.

  — For text boxes, display ToolTips centered under the control.
- Display them in the standard system ToolTip colors.
- Remove the ToolTip when the control is activated or the pointer is moved away.
- Don't substitute ToolTips for good design.
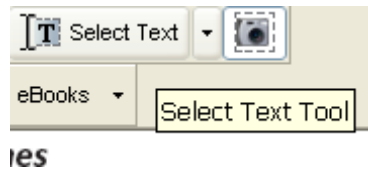
5. Balloon Tips

- Description:
  - — A small pop-up window that contains information in a word balloon.
  - — Components can include:
    - • Title.
    - • Body text.
    - • Message Icons.
  - — Appear adjacent to the item to which they apply, generally above or to left.
  - — Only one tip, the last posted, is visible at any time.
  - — Tips are removed after a specified time period.
- Purpose:
  - — To provide additional descriptive or status information about a screen element.
- Advantages:
  - — 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, their continual appearance can be aggravating.
- Proper usage:
  - — To display noncritical:
    - • Reminder information.
    - • Notification information.
  - — Do not use tips to display critical information.
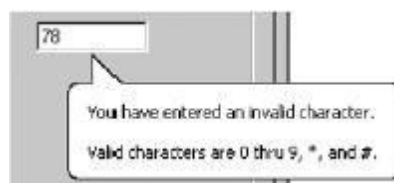
Balloon Tip Guidelines

- General:
  - — Use a notification tip to inform the user about state changes.
  - — Use a reminder tip for state changes that the user might not usually notice.
  - — Point the tip of the balloon to the item it references.
  - — Do not use them to replace ToolTips.
  - — Do not overuse balloon tips.
- Content:
  - — Restrict them to a length of 100 characters, including title and body text.

— Title text should:
  • If the tip refers to an icon or other image representing a specific object, include:
    — The object's name, using its normal capitalization.
    — The object's status, using sentence-style presentation without ending punctuation.
  • Be presented in bold.
— Body text should:
  • Include a description of the situation in one or two brief sentences.
  • Include a brief suggestion for correcting the situation.
  • Be presented using mixed-case in the sentence style.

6. Progress Indicators

☐ Description:
  — A rectangular bar that fills as a process is being performed, indicating the percentage of the process that has been completed.
☐ Purpose:
  — To provide feedback concerning the completion of a lengthy operation.
☐ Proper usage:
  — To provide an indication of the proportion of a process completed.

Progress Indicator Guidelines

☐ When filling the indicator:
  — If horizontally arrayed, fill it from left to right.
  — If vertically arrayed, fill it from bottom to top.
☐ Fill it with a color or a shade of gray.
☐ Include descriptive text for the process, as necessary.
☐ Place text outside of the control.

7. Sample Box

☐ 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.
    — Use mixed case in the headline style.
    — Locate it adjacent to the controls upon which it is dependent.

Sample

AaBbYyZz

6. Scrolling Tickers

- Description:
    — Text that scrolls horizontally through a container window.
- Advantages:
    — Consume less screen space than full text.
- Disadvantages:
    — Hard to read.
        — Time-consuming to interpret.
        — Distracting.
- Guideline:
    — Do not use.

Windows Tests - Prototypes

- 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.
- prototype may be a rough approximation, such as a simple hand-drawn sketch, or it may be interactive, allowing the user to key or select data using controls, navigate through menus, retrieve displays of data, and perform basic system functions.
- A prototype may have great breadth, including as many features as possible to present concepts and overall organization, or it might have more depth, including more detail on a given feature or task to focus on individual design aspects.

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.

— Suited for use by entire design team.

— No large investment of time and cost.

— No programming skill needed.

— Easily portable.

— Fast to modify and iterate.

— A rough approximation often yields more substantive critical comments.

— Easier to comprehend than functional specifications.

— 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.

— Driven by a facilitator, not the user.

— Limited usefulness for a usability test.

— A poor detailed specification for writing the code.

— Usually restricted to most common tasks.

☐ **Sketch Creation Process**

o Sketch (storyboard) the screens while determining:
— The source of the screen's information.
— The content and structure of individual screens.
— The overall order of screens and windows.

o Use an erasable medium.

o Sketch the screens needed to complete each workflow task.

o Try out selected metaphors and change them as necessary.

o First, storyboard common/critical/frequent scenarios.
— Follow them from beginning to end.
— Then, go back and build in exceptions.

o Don't get too detailed; exact control positioning is not important, just overall order and flow.

o Storyboard as a team, including at least one user.

o Only develop online prototypes when everyone agrees that a complete set of screens has been satisfactorily sketched.

Interactive Paper Prototypes

☐ Description:

— Interface components (menus, windows, and screens) constructed of common paper technologies (Post-It notes, transparencies, and so on).

— 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.

— Otherwise, generally the 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.

Programmed Facades

o Description:

— Examples of finished dialogs and screens for some important aspects of the system.

— Created by prototyping tools.

— Medium-fidelity to high-fidelity prototypes.

o Advantages:

— Provide a good detailed specification for writing code.

— A vehicle for data collection.

o Disadvantages:

— May solidify the design too soon.

— May create the false expectation that the ‒real thing‖ is only a short time away.

— More expensive to develop.

— More time-consuming to create.

— Not effective for requirements gathering.

— Not all of the functions demonstrated may be used because of cost, schedule limitations, or lack of user interest.

— Not practical for investigating more than two or three approaches.

Prototype-Oriented Languages

☐ Description:

— An example of finished dialogs and screens for some important aspects of the system.

— Created through programming languages that support the actual programming process.

— A high-fidelity prototype.

☐ Advantages:

— May include the final code.

— Otherwise, generally the same as those of programmed facades.

☐ Disadvantages:

— Generally the same as for programmed facades.

Kinds of Tests

A test is a tool that is used to measure something. The ‒something‖ may be:

☐ Conformance with a requirement.

☐ Conformance with guidelines for good design.

☐ Identification of design problems.

☐ Ease of system learning.

- Retention of learning over time.
- Speed of task completion.
- Speed of need fulfillment.
- Error rates.
- Subjective user satisfaction.

Guidelines Review

- Description:
  — A review of the interface in terms of an organization's standards and design guidelines.
- Advantages:
  — Can be performed by developers.
  — Low cost.
  — Can identify general and recurring problems
  — Particularly useful for identifying screen design and layout problems.
- Disadvantages:
  — May miss severe conceptual, navigation, and operational problems.

Heuristic Evaluation

- Description:
  — A detailed evaluation of a system by interface design specialists to identify problems.
- Advantages:
  — Easy to do.
  — Relatively low cost.
  — Does not waste user's time.
  — Can identify many problems.
- Disadvantages:
  — Evaluators must possess interface design expertise.
  — Evaluators may not possess an adequate understanding of the tasks and user communities.
  — Difficult to identify system wide structural problems.
  — Difficult to uncover missing exits and interface elements.
  — Difficult to identify the most important problems among all problems uncovered.
  — Does not provide any systematic way to generate solutions to the problems uncovered.
- Guidelines:
  — Use 3 to 5 expert evaluators.
  — Choose knowledgeable people:
    - Familiar with the project situation.
    - Possessing a long-term relationship with the organization.

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.
  - Can be used to evaluate alternate solutions.
  - Can be performed by developers.
  - More structured than a heuristic evaluation.
  - Useful for assessing ―exploratory learning.‖
- Disadvantages:
  - Tedious to perform.
  - May miss inconsistencies and general and recurring problems.
- Guidelines:
  - Needed to conduct the walkthrough are:
    - A general description of proposed system users and what relevant knowledge they possess.
    - A specific description of one or more core or representative tasks to be performed.
    - A list of the correct actions required to complete each of the tasks.
  - Review:
    - Several core or representative tasks across a range of functions.
    - Proposed tasks of particular concern.
  - Developers must be assigned roles of:
    - Scribe to record results of the action.
    - Facilitator to keep the evaluation moving.
  - Start with simple tasks.
  - Don't get bogged down demanding solutions.
  - Limit session to 60 to 90 minutes.

Think-Aloud Evaluations

- Description:
  - Users perform specific tasks while thinking out load.
  - Comments are recorded and analyzed.
- Advantages:
  - Utilizes actual representative tasks.
  - Provides insights into 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:
  — High cost for establishing facility.
  — Requires a test conductor with user interface expertise.
  — Emphasizes first-time system usage.
  — Poorly suited for detecting inconsistency problems.

Classic Experiments

☐ Description:
  — An objective comparison of two or more prototypes identical in all aspects except for one design issue.
☐ Advantages:
  — Objective measures of performance are obtained.
  — Subjective measures of user satisfaction may be obtained.
☐ Disadvantages:
  — Requires a rigorously controlled experiment to conduct the evaluation.
  — The experiment conductor must have expertise in setting up, running, and analyzing the data collected.
  — Requires creation of multiple prototypes.
☐ Guidelines:
  — State a clear and testable hypothesis.
  — Specify a small number of independent variables to be manipulated.
  — Carefully choose the measurements.
  — Judiciously select study participants and carefully or randomly assign them to groups.
  — Control for biasing factors.
  — Collect the data in a controlled environment.
  — Apply statistical methods to data analysis.
  — Resolve the problem that led to conducting the experiment.

Focus Groups

☐ Description:
  — A discussion with users about interface design prototypes or tasks.
☐ Advantages:
  — Useful for:
      • Obtaining initial user thoughts.
•   Trying out
          ideas.
—   Easy to set up and
          run.

— Low cost.
- Disadvantages:
    — Requires experienced moderator.
    — Not useful for establishing:
        • How people really work.
        • What kinds of usability problems people have.
- Guidelines:
    — Restrict group size to 8 to 12.
    — Limit to 90 to 120 minutes in length.
    — Record session for later detailed analysis.