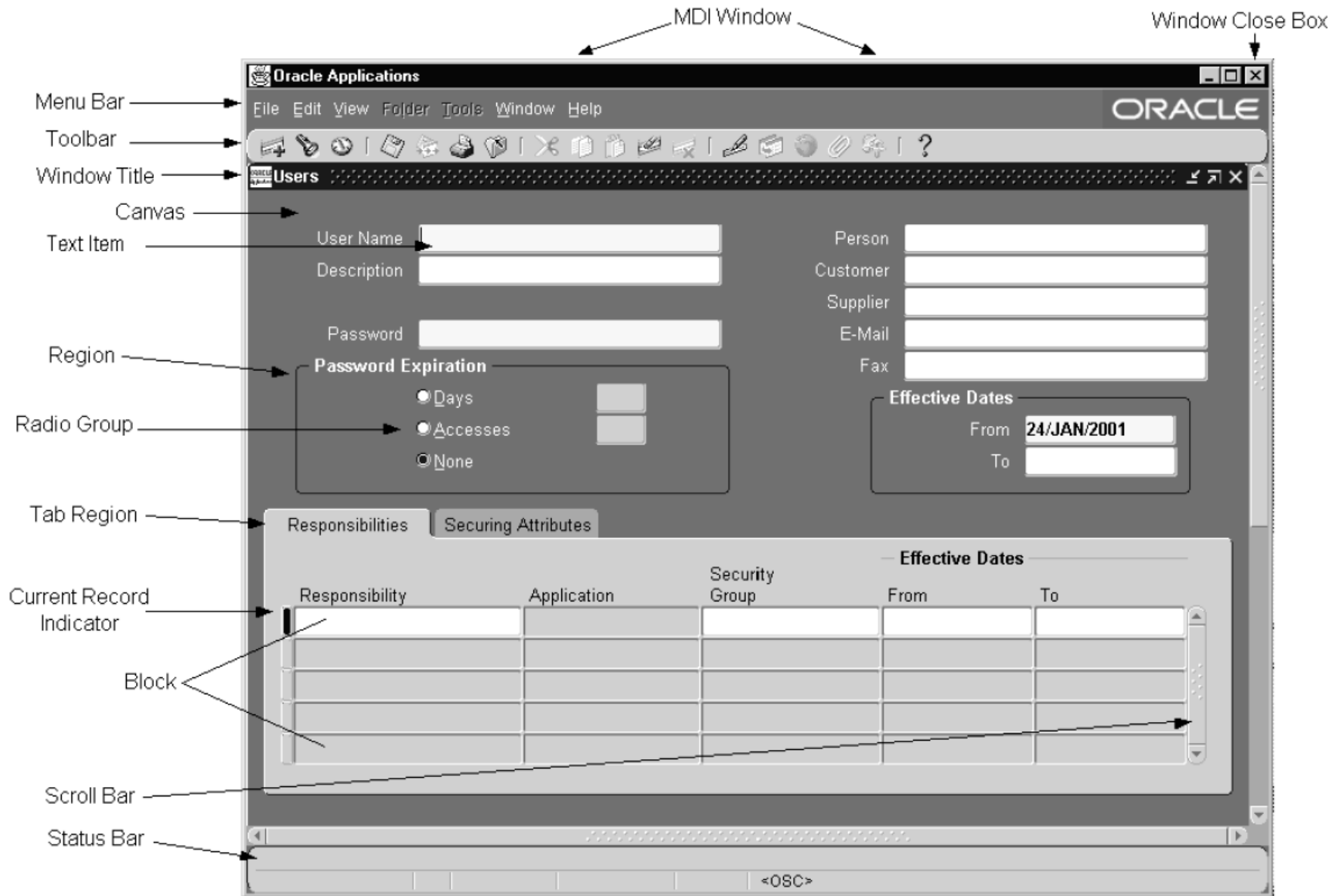# Proper Screen-Based Controls

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Topics

- Elements of the interface, including a brief overview of interface elements such as windows, menus, fields, and LOV's

- To understand how to use different interaction elements effectively.
  - ☐ Text
  - ☐ Color
  - ☐ Images
  - ☐ Moving images
  - ☐ Sound

Elements of Interface

Button

Description:

A square or rectangular-shaped control with label inside that indicates action to be performed.

A label may consist of text, graphic or both.

Purpose:

- **To start actions**
- **To change properties**
- **To display a pop-up window**

Proper frequent usage:

- **To cause something happen immediately**
- **To display another window**
-

Examples

- **To grape selected items from list**
- **To Add, Remove, Update and Cancel record(s)**
- **To open other form or window/ pop-up message**
- **To refresh existing displayed information**

Buttons example

Toolbars

Toolbars are compilations of commands, actions, or functions, usually graphical in structure but sometimes textual. Toolbars may also be called button bars, control bars, or access bars. Other shapes of toolbars are toolboxes or palettes.

Usage:

- ☐ To provide easy and fast access to most frequently used commands or options across multiple screens
- ☐ To invoke sub-applications (windows) within an application
- ☐ To use in place of certain menu item

Elements of Toolbars:

Elements can be Images, icons, buttons, text, combo items

Toolbar example

Text Entry/ read-only elements

Text Boxes

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

- Text may be entered or edited

- Text may be displayed or read-only

- Mostly it is shown with label description

- It has two types: single or multiple lines

- Can have initial value

- It allows text formatting like italic, bold or coloured etc.

Selection Control

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
- Related Controls
    - List Boxes
    - Combo Boxes
    - List View Controls
    - Drop-down/ Pop-up List Boxes (LOV)

► Radio Buttons

Description:

A two-part control consisting of the following

Small circles, diamonds, or rectangle

Choice description

When a circle is selected, the option is highlighted. **Only one choice is selected or highlighted**

Proper usage:

Requires an adequate space on screen

Most useful for data and choices that are:

- Small and fixed in number
- Not easily remembered
- Easily to understand with possible alternatives
- Never changed in content

► Check Boxes

Description:

A two part control consisting of a square box and choice description

Each option acts as a switch and can either "on" or "off" independently

When an option is selected (on), a mark as cross (X) or "check" appears within the square box.

Used alone or grouped in sets

Purpose:

To set one or more options as either ON or OFF.

Advantages:

Easy to access choices

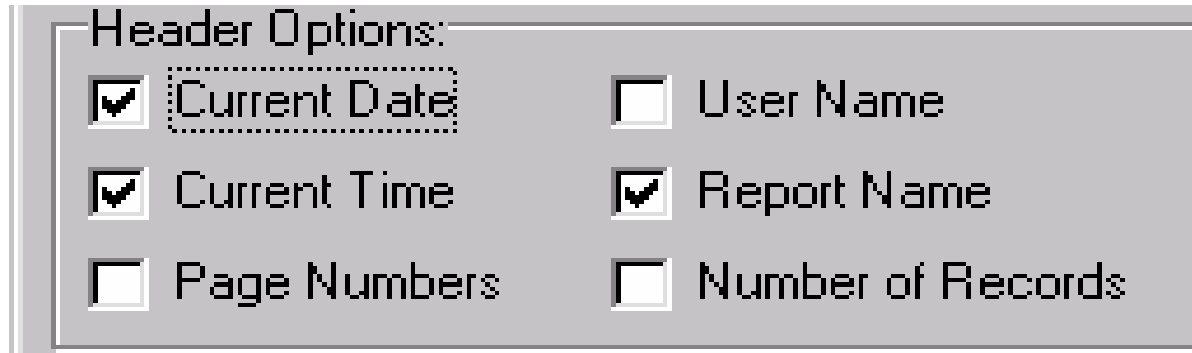Easy to compare choices

Preferred by users

Disadvantages:

Consume screen space

Limited number of choices

Single check boxes difficult to align with other screen controls

► Check Boxes VS Radio Buttons

Check Box: Square box used to set one or more options as either ON or OFF.

Header Options:
☑ Current Date   ☐ User Name
☑ Current Time   ☑ Report Name
☐ Page Numbers   ☐ Number of Records

Radio Buttons: Circle shape and only one choice is selected or highlighted

Banking & Cash
○ Checking
○ Savings
◉ Credit Card
○ Money Market
○ Cash

► Related Controls - 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

Choices may be text, pictorial or graphics representation

Selections can be made by using mouse to point and click. Tab, arrows keys and enter keys can be utilized for efficient use of screen

Purpose:

To display a collection of items containing the choice of single or multiple selections

Advantages:

Unlimited number of choices

Remind users of available options

Disadvantages:

Consume screen space

Often requires an action to see all list choices

The list items may change, making it hard to find items

List may be updated with different orders items, making difficult to find

► Related Controls - Drop-down/ Pop-up List Boxes (LOV)

Description:

A single rectangular control that shows one item with a small button.

A button provides a visual cue that an 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.

Purpose:

To select one item from a large list of options when screen space is limited.

Advantages:

Remind users of available options

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 unordered, makes difficult to find required item

Combo Boxes

Description:

A single rectangular text box entry field, beneath which is large rectangular list box (resembling a drop-down list box) displaying a list of options

The text box permits a choice to be keyed within it

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

Information keyed may not necessarily have to match the list items

Purpose:

To allow either typed 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:

Same as in Drop-down boxes

List Boxes

Sample Controls ? ×

Single Line Text Box

Multiple-line text box allows text
to appear across several lines

| Selected Choice |
| Choice 1 |
| Choice 2 |
| Choice 3 |
| Choice 4 |
| Choice 5 |
| Choice 6 |
| Choice 7 |

LOV

⦿ Selected radio button choice

◯ Unselected radio button choice

Drop Down List - Non Editable ▼

Combox Box - Editable ▼

COMBO

☑ Selected check box choice

☐ Unselected check box choice

Associated Edit Box

Button

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Common Approaches to Showing the Display Area

Paging displays a complete screen of characters at a time. The complete display area is known as a page (or screen). The page is replaced on demand by the next or previous page, much like turning the pages of a book.

Scrolling moves the displayed information up or down on the screen, one line at a time. This is similar to the way movie and television credits scroll up the screen at the end of a movie.

Interaction elements

- Text
  - How can we ensure that the text is legible?
  - Which font should we use?
  - How long should the lines be?
- Color
  - Which colors go well together?
  - How should color be used to communicate information more effectively?
  - How can we ensure that the colors we use have the correct connotations (meaning)?
- Images
  - What are the different types of images?
  - How do you choose the right one?
- Moving images
  - When is it useful to animate images?
  - When can video clips be used to good effect?
- Sound
  - When can sound be useful?
  - What are the different categories of sound and when should each be used?
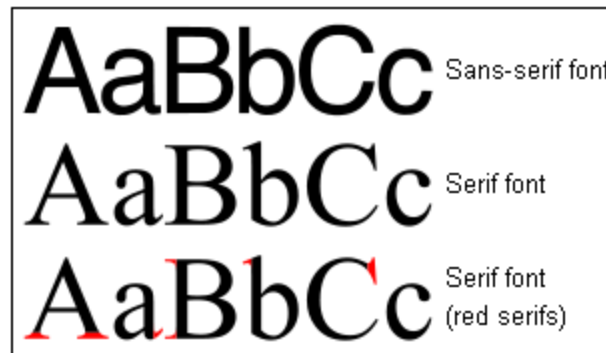
Text

- Text has a number of technical advantages:
  - Text files are small.
  - Text can be manipulated very easily.
  - Text is less ambiguous.
- Ensure that your text is legible (readable)

  - Typeface (font), type size, letter spacing, line spacing, line length, justification, line endings.

- Ensure that your text makes sense

  - Expressions, abbreviations.

Factors that affect the legibility of text

- ## Typeface

  - Sans serif typefaces (a category of typefaces that do not use serifs, small lines at the ends of characters) are more suitable than serif typefaces for use on a screen.

    - A serif is the finishing stroke at the end of a letter

  - Familiar typefaces such as Times or Arial are easier to read; unfamiliar ones, such as Chiller are more difficult.

AaBbCc — Sans-serif font
AaBbCc — Serif font
AaBbCc — Serif font (red serifs)

Factors that affect the legibility of text *(Cont'd)*

- Type size

  Too small is hard to read; Too big is also hard to read.

  - □ For text for continuous reading, 11- to 14-point type is a good range to work with.

  - □ Headings will stand out better if they are 3 to 5 point sizes larger.

Factors that affect the legibility of text *(Cont'd)*

- ## Letter spacing

  - ☐ Well-designed type faces have a pleasant amount of space between the letters.

Letters too close together
are hard to read

L e t t e r s   t o o   f a r   a p a r t   a r e
h a r d   t o   r e a d

Factors that affect the legibility of text *(Cont'd)*

■ **Line spacing**

- ☐ The legibility of smaller type size can be improved by increasing the line spacing.

- ☐ The longer the line, the wider the line spacing should be.

- ☐ However, if the line spacing is too wide, then the lines may not be perceived as being related to each other.

If you have small type sizes, then you increase legibility by increasing the leading. This text is at the default leading.

If you have small type sizes, then you increase legibility by increasing the leading. This text has extra leading.

Factors that affect the legibility of text *(Cont'd)*

- ## Line length
  - ☐ The maximum line length on a screen should be around 60 characters (or eight to twelve words).
    - ■ This allows a meaningful unit of text to appear in most lines.
  - ☐ You should avoid very short lines, as they break the text and it is more difficult to construct the meaning.

- ## Justification
  - ☐ Fully justified text (left- and right- justified) can create uneven gaps between the words on a page.
  - ☐ It is usually best to left-justify blocks of text.
  - ☐ Consider the relationship of the text to the item it belongs with.
    - ■ For instance, text on buttons usually looks neater if it is centered.

Color

- ■ We can use color for a variety of reasons:

    - □ To draw attention.

    - □ To show status.

    - □ To make the information on the display clearer.

    - □ To make the display more attractive.

Characteristics of Color

- Connotations (meaning) of different colors
  - When you use a color, you should think about what it is likely to mean to the people who look at it.
  - For example, in Western culture, red is often used as a warning color, but in China it is a joyful or lucky color.

- Color saturation
  - Colors aimed at young people tend to be pure and bright, whereas colors aimed at older people are deeper (full of meaning).

- Apply colors consistently; take into account the characteristics of the users, the tasks they are carrying out, and the environment.

Intrinsic (essential) brightness

- An important factor when you use several colors is the intrinsic brightness of each.

- For legible text, there needs to be sufficient contrast between the brightness of the background and foreground colors.
  - Example:

White on yellow is hard to read

White on black is easy to read

Red on blue

Blue on red

Green on pink

Pink on green

Dark blue on yellow

Yellow on dark blue

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Making effective use of color

- ## Number of colors
  - ☐ If you are using colors to organize the screen, then it is better to limit their number:
    - Too many colors can be confusing and unpleasant to look at.
    - Some guidelines recommend no more than six colors, in addition to black and white, for any one screen, and fewer is often better.

- ## Design for monochrome

  - ☐ Designing in black and white first can help to focus attention on the layout of the UI.

Using color to represent information

- **Color for emphasis**
  - Color can be used to emphasize the important area of the screen or the key parts of a diagram.
- **Color for grouping**
  - Color can be used to organize the screen.
- **Color coding**
  - Color can be used to represent a particular object or status.
- **Layering**
  - Color can be used to represent different layers within a diagram.

Images

- **Images can be used in several ways:**
  - □ To motivate, to attract the attention, to amuse, and to persuade.
  - □ To communicate information.
  - □ To help overcome language barriers.
  - □ To support interaction.

- **It is common to incorporate some form of functionality into images.**
  - □ Example: Google maps

Types of Images

- **Pictures**
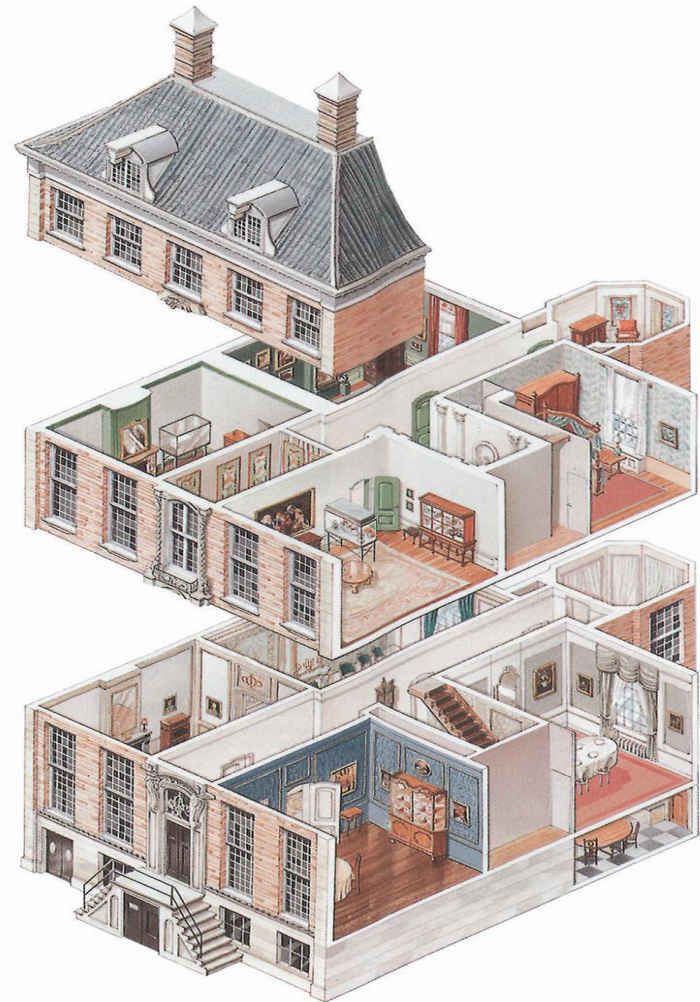 - ☐ Include photographs, drawings, and cartoons.

- **Diagrams**
  - ☐ Include maps and other representations of relationships between objects.

- **Graphs and charts**
  - ☐ Visual representations of numbers.

Example

- Pictures can provide information that would be difficult to describe in words.

- An illustration of the Museum Willet-Holthuysen in Amsterdam, a 17th- century building that was once a family house.

  □ The illustration contains a large amount of detail about the size, shape, and relative position of the various rooms in the house.
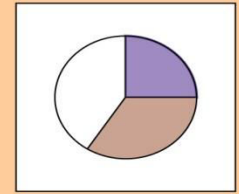
Example

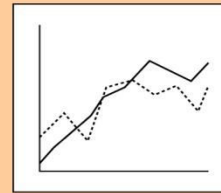- It is important to choose the appropriate type of chart according to the data you want to represent.
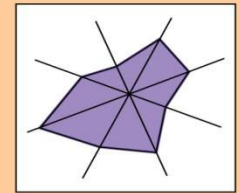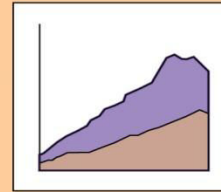
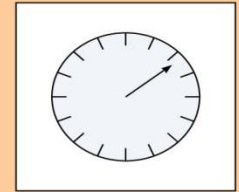

Scatterplots
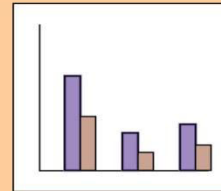
Pie charts

Line graphs or curves

Radar

Area, band, strata or surface charts

Star, circular or pattern charts

Bar graphs, column charts or histograms

Using images effectively

- Choose the most appropriate type of image according to the information you need to convey and the impact you wish to make.

- Design the image so that it meets the requirements of the task as closely as possible.

- Combining text and images can be particularly effective.

- Take the user's screen resolution into account.

Moving images

- **Animation can be used for the following purposes:**

  - To illustrate movement.
  - To provide dynamic feedback.
  - To attract attention.
  - To show that the computer system is operating.

- **Examples?**

Sound

- Sound is vibration, as perceived by the sense of hearing.

- The particular auditory effect produced by a given cause; "the sound of rain on the roof"; "the beautiful sound of music".

- Mechanical energy vibrations transmitted as waves through all forms of solid, liquid, or a gas that can be detected by the human ear.

- Sound is a wave phenomenon like light, but it is microscopic and involves molecules of air being compressed and expand under the action of some physical device.

Sound

- There are two types of sound that are special: music and speech.

- Human ear detects frequencies between 20 HZ and 20 KHZ.

- The upper limit decreases with increasing age.

- The majority of people can no longer hear 20 KHz by the time they are teenagers, and progressively lose the ability to hear higher frequencies as they get older.

- Most human speech communication takes place between 200 and 8,000 Hz.

- Sound above the hearing range is known as ultrasound, and that below the hearing range as infrasound.

Sound

- Making good use of sound effects, music and speech.

- Privacy issue – use of headphones.

- Concatenation (Link things together) issue.

- Allow the users to change the volume or disable the sound if they want.

Summary

- Elements of the interface, including a brief overview of interface elements such as windows, menus, fields, and LOV's

- To understand how to use different interaction elements effectively.

    - Text
    - Color
    - Images
    - Moving images
    - Sound