Chapter 7
User Interface Design

Topics

- Interface design as multidisciplinary activity
- From interface prototype to implementation
- Guidelines for user-centered interface design
- Interface windows
- Dependencies between windows
- Window navigation

GUI design multidisciplinary

- A team includes
  - Analyst
  - Designer
  - Technology expert
  - Graphic artist
  - Social and behavioral scientist
  - Programmer
Example 7.1 – Contact Management

GUI design guidelines

- User in control
- Consistency
- Personalization and customization
- Forgiveness
- Feedback
- Aesthetics and usability
**GUI-program flow of control**

- User event → Call to window
- Call to window → Call to 4GL-SQL procedure
- Call to 4GL-SQL procedure → Rule or exit processing
- Rule or exit processing → Perform GUI event
- User event → Call to external program
- Call to external program → Rule or exit processing
- Rule or exit processing → Perform GUI event

**User in control**

- Rather “user’s perception of control”
- No mothering principle
- Feedback

**Consistency**

- The conformance to the GUI vendor's standards
  - A GUI developer must not be too creative and innovative in the interface design.
- The conformance to the naming, coding and other GUI-related standards developed internally by the organization
  - This includes the naming and coding of the menus, action buttons, screen fields, etc.
  - It also includes any standards for the placement of objects on the screen and consistent use of other GUI elements across all internally developed applications.
Personalization and customization

- The GUI personalization is the customization for a personal use
  - e.g. when a user reorders and resizes columns in a row browse (grid) display and saves these changes as his/her personal preference
- The GUI customization is an administrative task of tailoring the software to different groups of users
  - e.g. when the program can operate differently for novice and advanced users

Forgiveness

- A good interface should allow the users to experiment and make mistakes in a forgiving way
- The forgiveness encourages an interface exploration because the user is allowed to take erroneous routes but can be “rolled back” to the starting point if necessary.
- The forgiveness implies a multi-level undo operation.

Feedback

- The feedback guideline is a spin-off of the first guideline – the user in control guideline.
  - To be in control implies to know what’s going on when the control is temporarily with the program.
- The developer should build into the system visual and/or audio cues for every user event.
  - Hourglass, wait indicator…
Aesthetics and usability

- The aesthetics is about the visual appeal.
- The usability is about the ease, simplicity, efficiency, reliability and productivity in using the interface.
- The issues to consider include:
  - the fixation and movement of the human eye,
  - the use of colors,
  - the sense of balance and symmetry,
  - the alignment and spacing of elements,
  - the sense of proportion,
  - the grouping of related elements, etc.
- Simplicity – additional and related guideline

Primary window

Example 7.2 – Contact Management
Tree and row browser

Web page

Secondary window

- Modal or modeless
- No “bars” — menu bar, toolbar, scroll bar, status bar
- Kinds
  - Dialog box
  - Tab folder
  - Drop-down list
  - Message box
**Stereotyping for GUI design**

- **Product Browser**
  - **<<Primary Window>>**
    - **Insert**
    - **Delete**
  - **<<toolbox button / menu item>>**
  - **<<toolbox button / menu item / double click>>**
    - **Update**

**State stereotypes**

- **Primary window**
  - Pane in primary window
  - Row browser
  - Tree browser
  - Web page
- **Secondary window**
  - Dialog box
  - Message box
  - Tab folder
- **Window data**
  - Text box
  - Combo box
  - Spin box
  - Column
  - Row
  - Group of fields

**Activity stereotypes**

- **Drop-down menu item**
- **Pop-up menu item**
- **Toolbar button**
- **Command button**
- **Double click**
- **Picklist selection**
- **Keyboard key**
- **Keyboard function key**
- **Keyboard accelerator key**
- **Scrolling button**
- **Window close button**
Window navigation diagram

Example 7.6 - Telemarketing

Summary

- The GUI design is a **multidisciplinary activity** requiring a combined expertise of a few professions.
- The design must adhere to the **guidelines** published by the manufacturer of a windows interface adopted in the project.
- The Microsoft Windows interface distinguishes between the **primary window** and **secondary window**:
  - **Primary window** can be a row browser, tree browser or Web page.
  - **Secondary window** can be a dialog box, tab folder, drop-down list or message box.
- **Window Navigation Diagram** captures the possible navigation paths between application windows.