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 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

- Title bar
- Icon
- Title text
- Buttons to minimize, maximize, and close window
- Menu bar
- Status bar
- Vertical scroll bar
- Horizontal scroll bar
- Toolbar
- Pane

---

Example 7.2 – Contact Management

Microsoft Outlook – Calendar window
Example 7.2 – Contact Management

Row browser

Multi-pane row browser
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
Example 7.4 - Contact Management

Drop-down list

Message box
Stereotyping for GUI design

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
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.