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
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
Example 7.2 – Contact Management

Microsoft Outlook – Calendar window

Example 7.2 – Contact Management

Microsoft Outlook – Contact Management System
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

Dialog box

Field prompt  Not editable field value  Editable field value

![Diagram of a dialog box with fields for Product/Details, Description, Category, Status, Created by, Last Modified by, and Notes.]
Example 7.3 - Contact Management

Tab folder
Example 7.4 - Contact Management

Drop-down list
Message box

Aim2000 Data Dictionary Maintenance

No Ad Link modified by the Merge!

OK

Document and its view
**Single document interface**

![Image of a single document interface with a contact management system screen showing a list of actions and tasks such as phone calls, emails, and notes.]

**Multiple document interface**

![Image of a multiple document interface with a data collection and quality control system showing a tree structure with categories such as Ad Link, Dictionary, and Products with subcategories and items like Bar, Theatre, and Fitness Centre.]
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

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.

MACIASZEK (2001): Req Analysis & Syst Design