User interface design
User characteristics

• User role
• Objectives
• Properties
  – organization position
  – ability to decide
  – experience and skills
  – age
  – level of education
  – constraints
• Critical success factors
  – needs and opportunities
  – preferences and exclusions
• Task scenarios
Main rules of UI design

- **Layout** – interface visual organization
- **Awareness of content** – user should know what is seen and what can be done
- **Aesthetics** – balance between functionality and visual attractiveness
- **User experience** – ease to learn for new users and operational for experienced users
- **Consistency** – intuitive and user friendly
- **Effort minimization** – as less steps for user to complete task as possible
Layout guidelines

- Each area with clear frontiers
- Each area with clear purpose
- Each area with only such information that is within its purpose
- User processing order: from top do bottom, from left to right (area importance)
Awareness of content (1)

• Each window and report with a title that identifies its content
• User should see the path do get to any place (menu, breadcrumbs)
• Buttons with text identifying their functions. Alternatively – clear icons.
• Clear answer buttons in message windows
Awareness of content (2)

• Different format in neighbor areas (text – graphics, different fonts)
• Color differentiation is not enough (color-blind users!)
• If format is similar than separate areas with graphical elements (lines, whitespace)
• Each field identified with a label
• Not obvious field format should be clearly seen (e.g. data format)
• Report with its preparation date
Aesthetics guidelines (1)

- Balance between functionality and visual attractiveness
- White space amount fitted to user experience (50% for new users, 10% for experienced users)
- Not to much fields to fill!
- Form or report should be as large as a person can process at one time
Aesthetics guidelines (2)

• Not to small font! Main text – 8 to 10 pts.
• Forms with sanserif font, reports with serif fonts
• Avoid more than two different fonts
• Avoid artistic (script) fonts
• Mild colors in graphics – contrast colors are awareness but hard to stay in focus
• Remember about color-blind users!
User experience (1)

• Interface should be ease to learn and to operate by new users.
• Interface should help operation (and work automation) for experienced users.
• Menu should show all the application functions (no hidden functions)
• Menu: only three levels of main menu and two levels of submenus
• No more than 7 menu items (otherwise items should be grouped)
User experience (2)

• Fast access to frequently used functions (tool buttons and / or keyboard shortcuts)
• Toolbox with clear icons (and text captions if possible)
• If many toolbox buttons then they should be grouped
• Configurable menus and toolbox
• Tooltips for new users
• Application help is recommended
Consistency

• User interface should be similar to other applications interfaces (standards)
• Separate parts of user interface should be similar
• All forms and reports should use the same glossary and the same format and navigation
Effort minimization

• Mouse click counts minimized until three
• As less keyboard usage as possible
• Automation of repeat of frequently used functions
• Simple operations should be grouped to compound ones
Process of UI design

Use scenarios design

Interface layout design

Standard components design & usage

Interface prototyping

Interface evaluation
Use scenario

• Use scenario is a description of steps that a user should go to complete a task.
• Foundation: use case model, sequence diagrams
• Only main scenarios considered
• Presentation: text description with numbered steps
Example

1. A customer browsing an offer

1. A customer browses an offer searching for interesting articles in some category
2. A customer searches only basic info and compares several articles including price
3. A customer gets chosen article and puts it in into a basket
4. A customer returns to browse the offer
Layout design

• Schematic drawing
• Alternative: Window Navigation Diagram (WND)
Window Navigation Diagram (WND)

- **Main Menu**
  - **Menu A**
    - **Form A**
  - **Menu B**
    - **Form B**
    - **Form C**
    - **Report A**
Standard UI components (1)

• Standard UI components are used in many forms and reports
• Standard UI components are taken from some framework library
• Missing UI components are designed by developers
UI prototyping

- *Storyboard*
- HTML prototyping
- Prototyping in a target programming language
**Storyboards**

**Menu klienta**
- Dodaj klienta
- Znajdź klienta
- Lista klientów

**Dodaj klienta**

**Znajdź klienta**
- Imię
- Nazwisko
- Adres
- Miejscowość
- Kod poczt.
- Ulica
- Nr domu
- Nr lokalu

**Dane klienta**
- Imię
- Nazwisko
- Adres
  - Miejscowość
  - Kod
  - Ulica
  - Nr domu
  - Nr lokalu

**Lista klientów**
- Abacki Adam
- Babacki Bartosz
- Cabacki Czesław

**Lista klientów**

**Znajdź klienta**

**Dodaj klienta**

**Popraw Dane Klienta**

**Klient Znaleziony**
Prototyping in

- HTML
  - interactive prototype
  - fast to achieve
  - not precisely models a target interface

- target language
  - interactive prototype
  - slow to achieve
  - precisely models a target interface
Interface evaluation

- Heuristic evaluation
  - check guidelines
  - expert evaluation
- Evaluation by developer and user together
- User observation
Bibliography


• Rolf Hennicker, Nora Koch: *Modeling the User Interface of Web Applications with UML* (PDF)  
  Coad P., Yourdon E.: *Object-oriented design* (book)