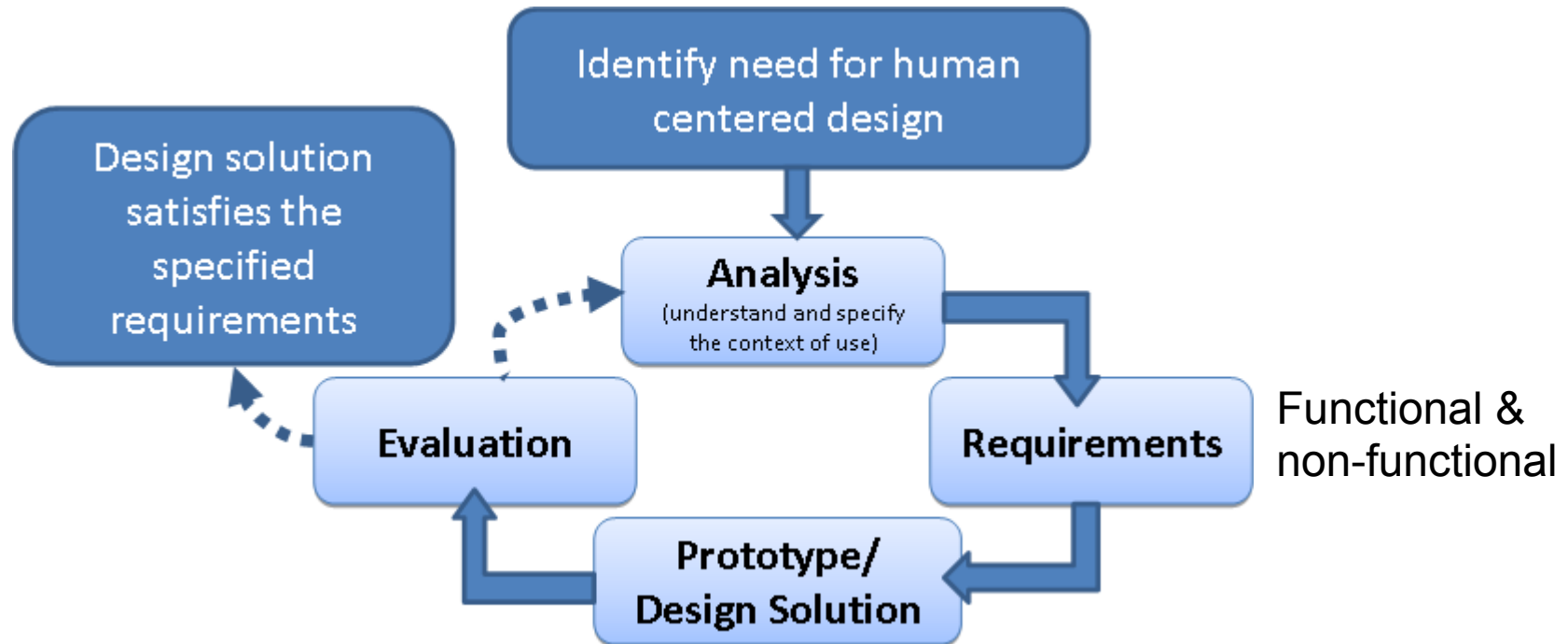# Usability Heuristics

Today…

- **Usability Heuristics**
- **User Analysis**
- **Task Analysis**

- **Discussion of Reaction Sheets**
- **Team Building**

Human-Centered Design Process

Human centered design process (based on ISO 13407:1999).

Image from Kriglstein 2011 (Dissertation)

What is Usability?

- **Definition (ISO 9241):**
  The effectiveness, efficiency and satisfaction
  with which specified users achieve specified goals
  in particular environments.

- **effectiveness:** the accuracy and completeness with which specified users can achieve specified goals in particular environments

- **efficiency:** the resources expended in relation to the accuracy and completeness of goals achieved

- **satisfaction:** the comfort and acceptability of the work system to its users and other people affected by its use

Usability

- Describe 2 problems you encountered and perceived as annoying or irritating when interacting with a software interface.

  - Please use the following template:

    - Software name

    - Problem statement (user perspective, 2-3 sentences)

5 Minutes

Usability Heuristics
10 Principles by Nielsen

- Simple and natural dialogue

- Speak the users' language

- Minimize user memory load

- Consistency

- Feedback

- Clearly marked exits

- Shortcuts

- Good error messages

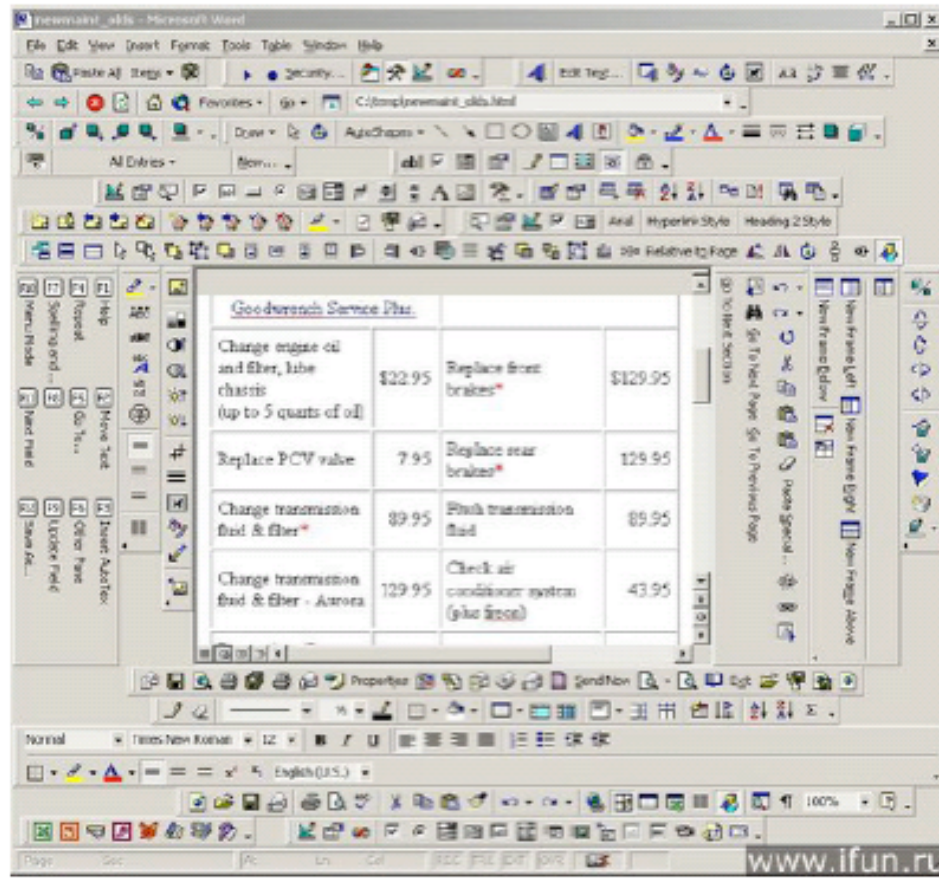- Prevent errors

- Help and Documentation

1 Simple and natural dialogue

- Interface...
  - ...keep it simple
  - ...keep it natural
  - ...follow perceptual laws: Gestalt laws

- Do not overdo it
  - Colors (color deficiency), fonts
  - Unnecessary functionality (leave it out)

- **Less is more**
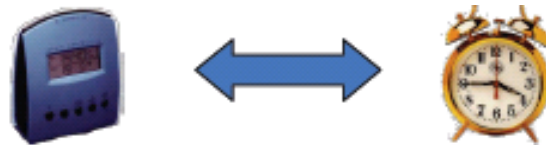 - User needs to sequentially "read" all the available functions on the screen

Example: Less is more

2 Speak the users' language

- Natural language / domain-specific language
- Avoid technical jargon
- Mother tongue? Prefer over English?
- Dialogue from the users perspective
- Use metaphors (wisely!)

Example: Domain-Specific Metaphors

Example: User Perspective and Metaphors

http://www.catb.org/esr/writings/taouu/html/graphics/bobhome1p.png

Quelle: https://videoonline.edu.lmu.de/en/node/6772/4016160

3 Minimize user memory load

- Short-term memory very restricted: 7+/-2 rule

- Implications for design
  - Minimize the number of simultaneous options, e.g. menus
  - Recognition "beats" recall
  - Beginners, advanced users, experts

4 Consistency

- ## Look and feel
  - Fonts, colors, icons

- ## Structure and organization
  - Layout, order, sequences

- ## Text and language
  - Menus, help, labels

- ## Interaction
  - Types/forms, across devices (mouse, keyboard, touch)

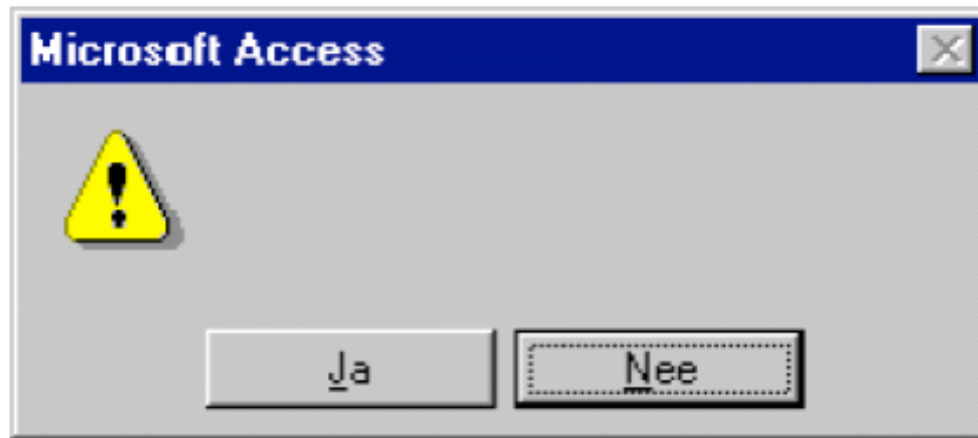# Example: inconsistency / little structure

5 Feedback

- User needs feedback about the state of the system
- Positive Feedback
- Partial Feedback
- Clear Message
- Response Time
- System Failure

Öffnet beispieldatei.xds: ███████████████

Example: Bad Feedback

Example: Bad Feedback
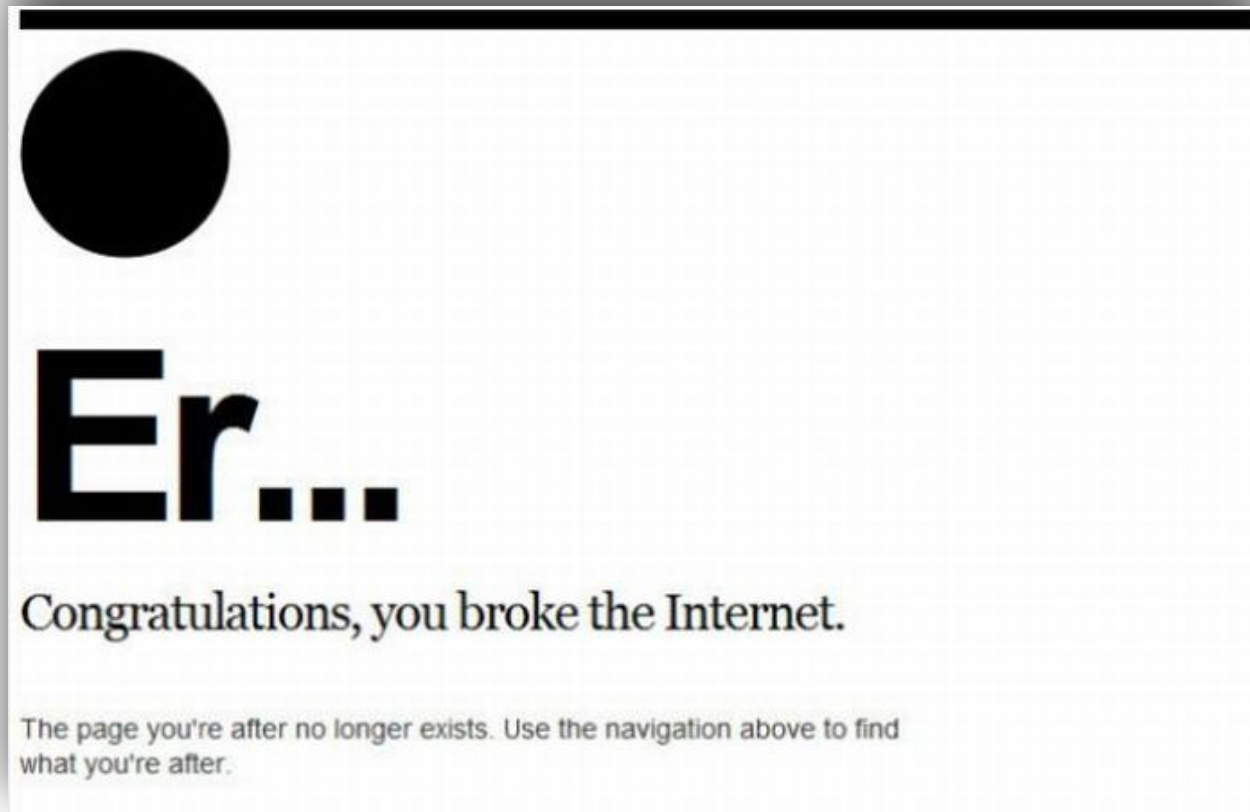
6 Clearly marked exits

- Cancel button

- Undo

- Visible!

6 Clearly marked exits

- Why is "Undo" important for the user?
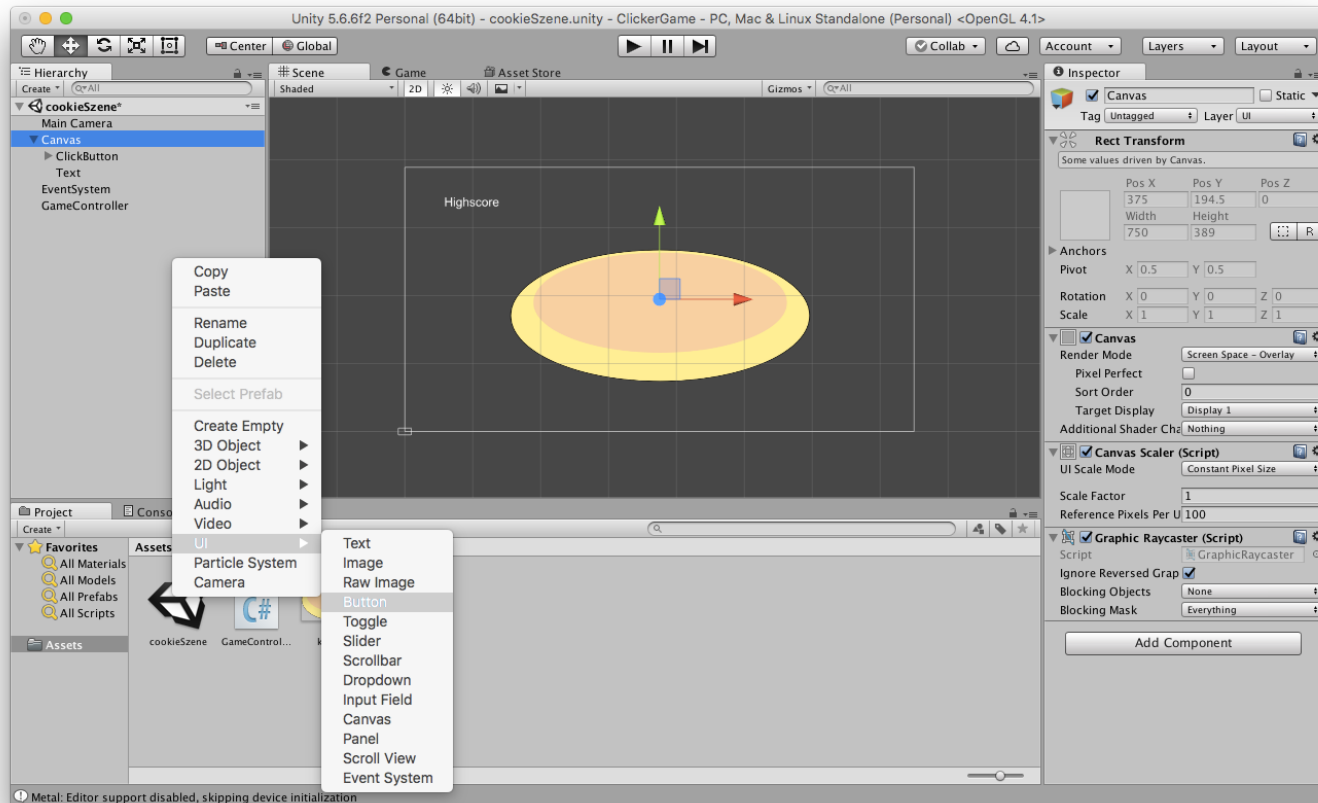
7 Shortcuts

- Shortcuts for advanced and expert users

- Type-ahead

- Consistent key combinations

Example: Type Ahead
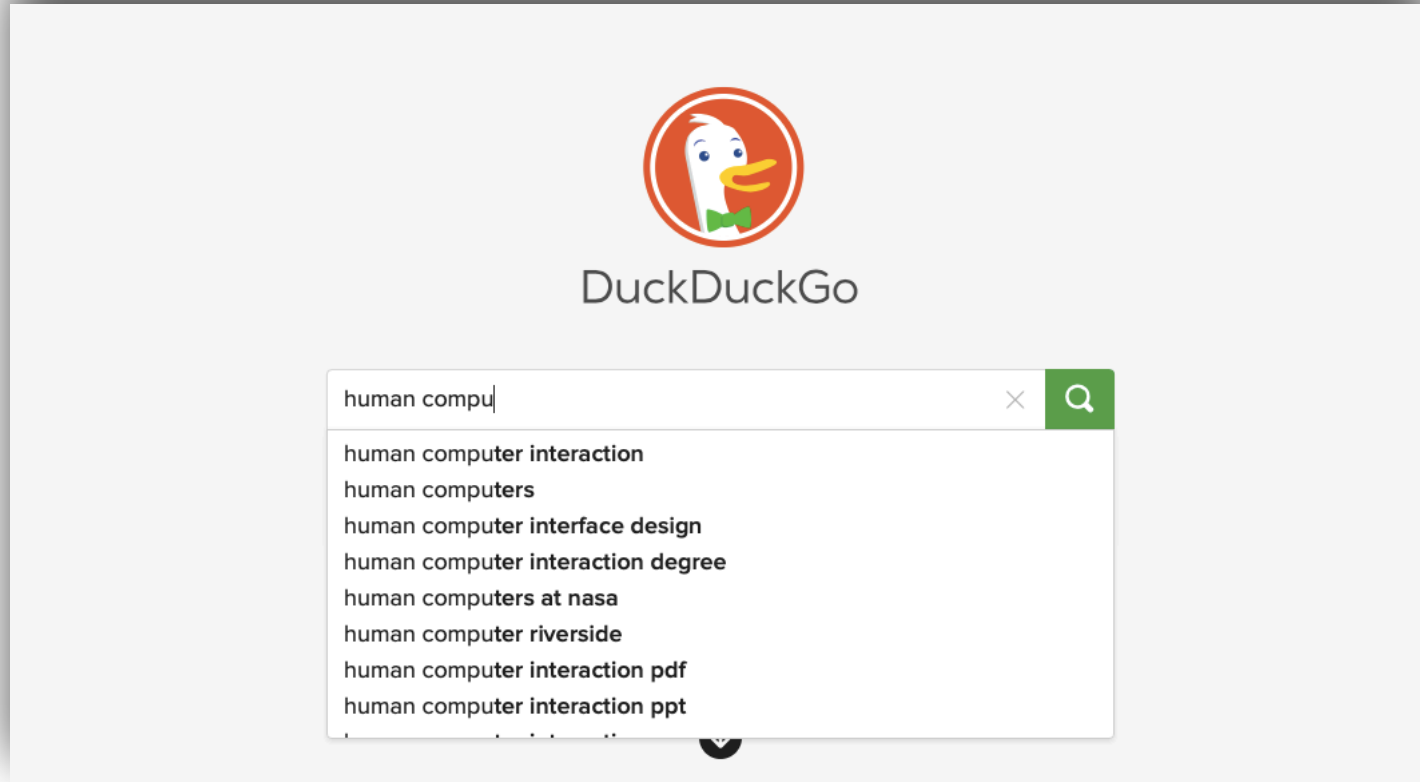
8 Good error messages

- Clear and simple language
- Precise descriptions
- Polite and *not* intimidating

Error Deleting File

Cannot delete 016: There is not enough free disk space.

Delete one or more files to free disk space, and then try again.

[OK]
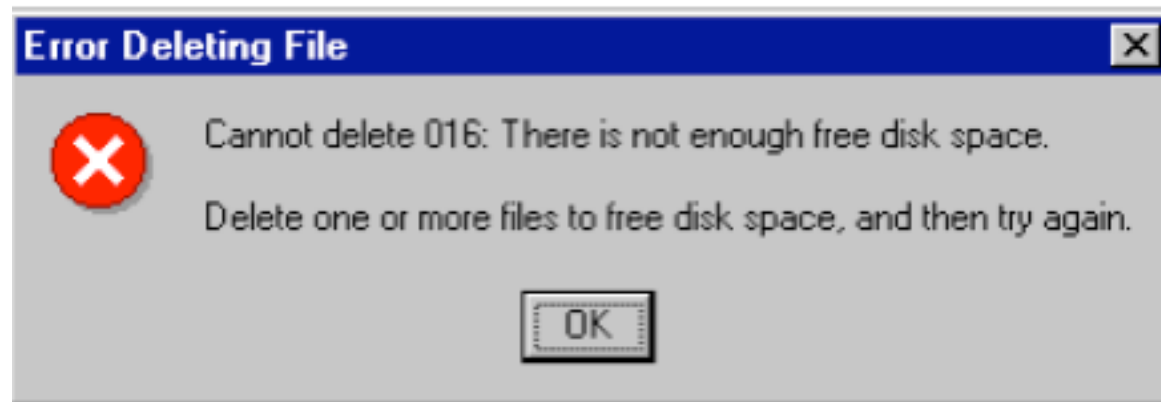
Examples for bad error messages
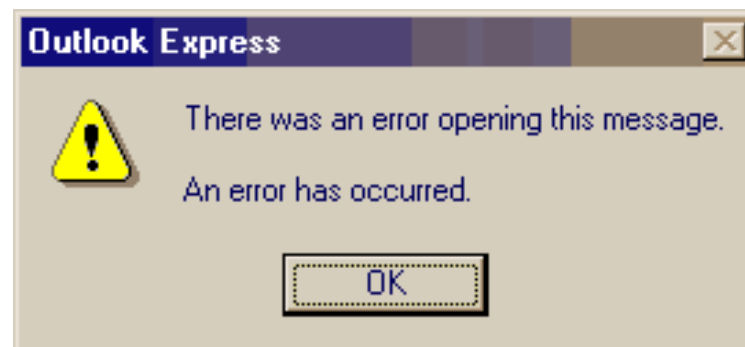
9 Prevent errors

- Use constraints, e.g.,
    - Indicators for inputs
    - Default values
    - Pre-defined selections (drop down)

- Avoid different modes: A key should always have the same meaning regardless of the system mode
    - e.g., Key F1 is always "help"

10 Help and documentation

- … who reads manuals??
- Users do trial and error

- Complete and clear documentation
- Update help and documentation with changes in the tool
- Online help
- Tutorials

Usability Heuristics

- Describe 2 problems you encountered and perceived as annoying or irritating when interacting with a software interface.

  - Please use the following template:

    - Software name

    - Problem statement (user perspective, 2-3 sentences)

    - **Please add your usability issues to the following padlet:**

      https://padlet.com/mhmnn9/heuristics

      Password: HCI2020

<mark>8 Minutes</mark>

Heuristic Evaluation

1. Briefing Session:
- Guideline available?

2. Evaluation Period:
- 1 - 2 hours on product, using the heuristics for guidance
- at least 2 passes through the interface: feel for the flow of interaction - identify potential usability issues

3. Debriefing Session:
- Evaluators come together and discuss their findings, suggest solutions

(Preece et al. 2015, p. 508/509)

Usability Heuristics

https://www.youtube.com/watch?v=hWc0Fd2AS3s

Sources

- Nielsen, J. (1993): Usability Engineering, San Diego (p. 115-163)

- Preece, J., Rogers, Y., & Sharp, H. (2015). Interaction design: beyond human-computer interaction. John Wiley & Sons (p. 500 - 511)

- ISO 9241

- Peter Purgathofer: Vorlesungsfolien User Interface Design WS05

- Isys Information Architects „Interface Hall of Shame": http://hallofshame.gp.co.at/

Anhang für Interessierte

- Styleguides
- Shneiderman – 8 Goldene Regeln

Styleguides

- Ziel: konsistente Benutzungsoberfläche

- Alle Projektbeteiligte sollen den Styleguide kennen und anwenden

- Look And Feel: Aussehen und Interaktivität
  - Aussehen von einzelnen Interaktionselementen
  - Anordnung von Interaktionselementen zu Dialogen oder Formularen
  - Logik von Dialogen
  - Verwendung von Begriffen und Bezeichnungen
  - Verwendung von Icons und bildhaften Beschreibungen
  - Verwendung von Farben und Formen
  - Abfolge und Ablauf von einzelnen Schritten
  - Aufteilung von Inhalt, Gestaltung und Funktionalität (Websites)

Siehe: nächste Vorlesung zu "Design Principles"

Shneiderman – 8 Goldene Regeln (1)

1. Konsistenz
   - Verwende Styleguides und weitere schriftliche Konventionen.

2. Berücksichtige unterschiedliche Erfahrungen
   - Jedem sollte eine Benutzungsschnittstelle möglichst eine passende Interaktionsform anbieten.
   - Anfänger: über Menüs
   - Abkürzungen für erfahrene Benutzer

Shneiderman – 8 Goldene Regeln (2)

3. Rückmeldungen auf Aktionen des Benutzers
- Aktion bei der Software angekommen
- Insbesondere, wenn die Aktion nicht schnell ein Ergebnis liefert.
- Akustisch, visuell, taktil

4. Abgeschlossene Operationen
- Schritte einer Operation im Zusammenhang darstellen

5. Fehler verhindern
- Darstellung eindeutig
- Alternativen auswählen

Shneiderman – 8 Goldene Regeln (3)

6. Einfache Rücksetzmöglichkeiten
   - Selbstsicherheit des Benutzers steigt stark an
   - Exploratives Lernen

7. Benutzerbestimmte Eingaben
   - Gefühl, die Anwendung steuern, kontrollieren zu können.

8. Geringe Belastung des Kurzzeitgedächtnisses
   - Kapazität 7 +– 2 Einheiten
   - Aufbau von Menüs besser breit statt tief