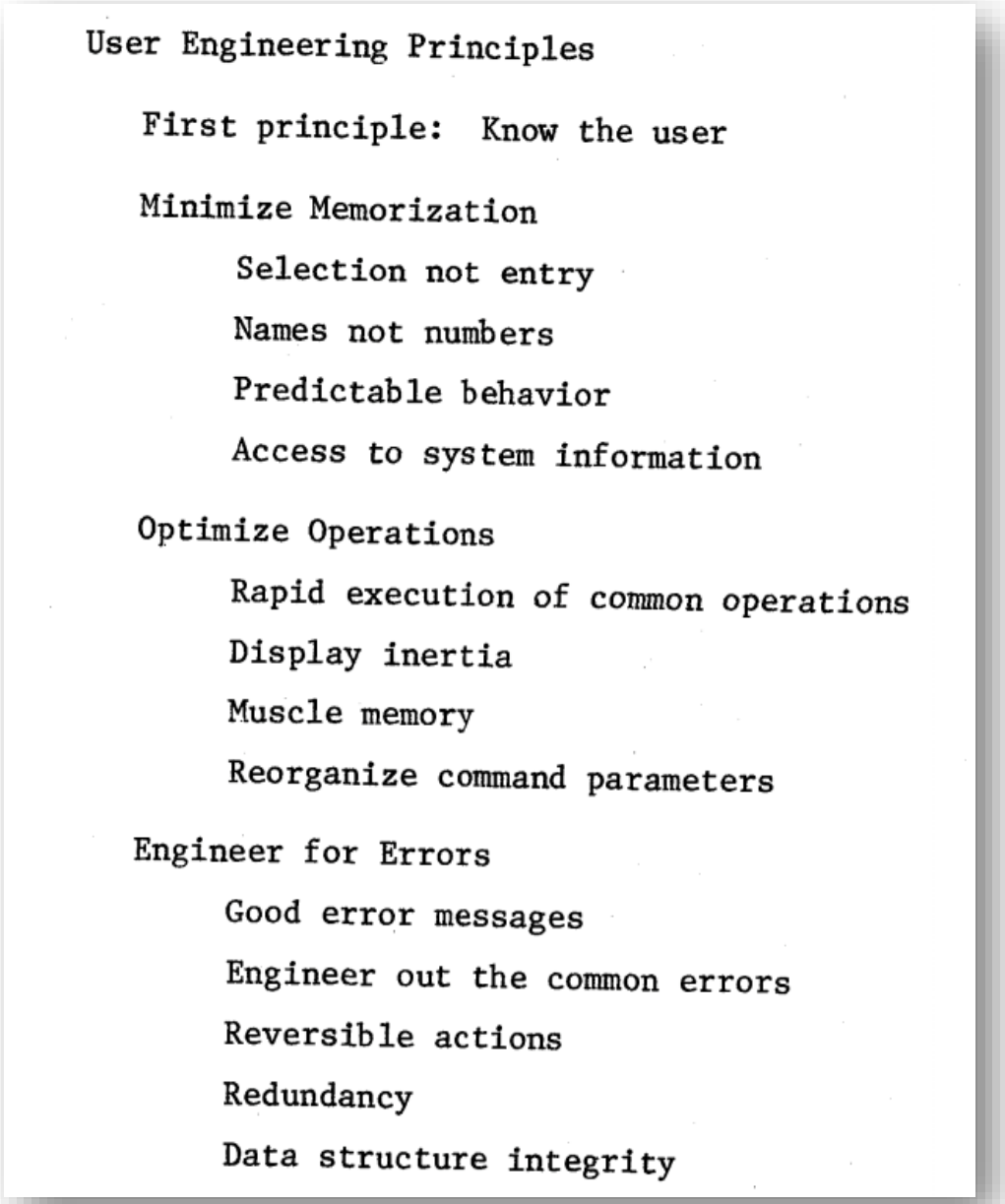
Know the User and Tasks

Learning Goals

- Understand …
  - Why it is important to know the user and their tasks
  - How a task frequency analysis works and what it is good for
  - The concept of personas and their value for designing interacive systems
- Be able to …
  - explain why it is important to determine the supported task in the process before the system is designed
  - explain a hierarchical task analysis for a given example
  - conduct a basic stakeholder analysis

User engineering principles for interactive systems

Wilfred J. Hansen. 1971



User Engineering Principles

First principle: Know the user

Minimize Memorization

- Selection not entry
- Names not numbers
- Predictable behavior
- Access to system information

Optimize Operations

- Rapid execution of common operations
- Display inertia
- Muscle memory
- Reorganize command parameters

Engineer for Errors

- Good error messages
- Engineer out the common errors
- Reversible actions
- Redundancy
- Data structure integrity

Wilfred J. Hansen. 1971. User engineering principles for interactive systems. In Proceedings of the fall joint computer conference. http://doi.acm.org/10.1145/1479064.1479159

Who is my user?

Usage Profiles “Know Thy User”

- Different people have different requirements for their interaction with computers.
- Issues to take into account:
  - goals, motivation, personality
  - education, cultural background, training
  - age, gender, physical abilities, …
- Experience:
  - Novice users
  - Knowledgeable intermittent users
  - Expert frequent users

Wilfred J. Hansen. 1971. User engineering principles for interactive systems. In Proceedings of the fall joint computer conference. http://doi.acm.org/10.1145/1479064.1479159

User-Needs and Task Profiles

What is the system for?

- Find out what the user is trying to do!
  - **the goal**
  - what their **needs** are
  - resulting **tasks**
- Supported tasks should be determined before the design starts
- Functionality should only be added if identified to help solving tasks
  - Temptation: If additional functionality is cheap to include it is often done – this can seriously compromise the user interface concept (and potentially the whole software system)!
- Frequency of tasks related to user profiles

User Diversity

One size fits all?

- Example: flight booking webpage
  - Travel agent booking many flights a day – everyday
  - A teacher organizing a field trip (once a year) and making bookings for a large group
  - A business person changing bookings while travelling
  - A family looking for a package holiday
- Basic concepts to structure the problem
  - Usage profiles
  - Task profiles

Task Frequency Analysis

Hypothetical Analysis – travel web site

- Will one website fit all the users?

Task / *Persona*	Group reservation	Change of itinerary	Booking child care	Comparing sales agent performance
Sales agent	0.2	0.1	0.1	0
Manager	0	0	0	0.3
Family	0.05	0.05	0.3	0
Business traveler	0.01	0.2	0.01	0

Task Frequency Analysis

Mini Exercise: Instagram, YouTube, EBay, WhatsApp

- Pick one Application, think of typical personas and their tasks, fill in hypothetical task frequencies

Task *Persona*				

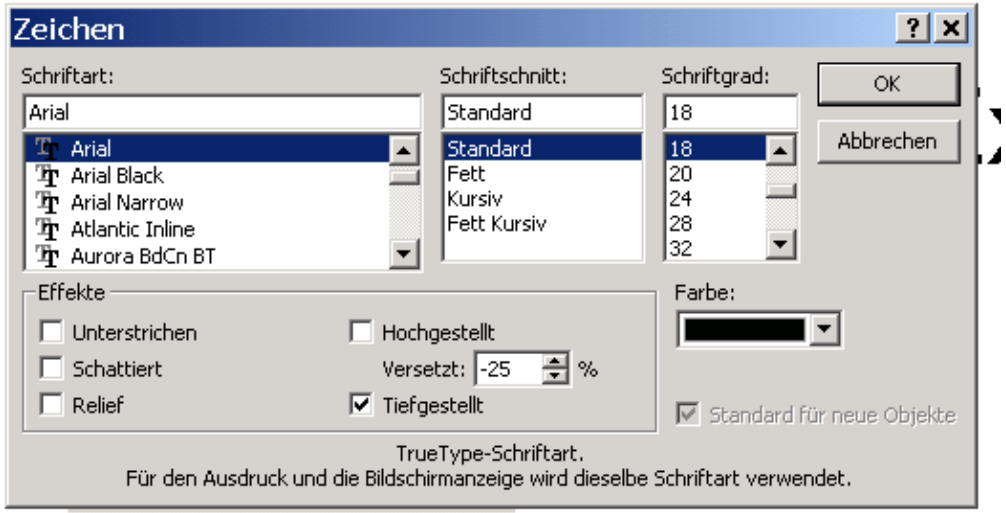
Task Frequency Analysis

What is it good for?

- Helps to shape the interaction design
  - Frequent action should be simple and quick to carry out
  - Infrequent action may take longer
  - Menu structure should reflect this
- Example
  - Frequent actions: Toolbar or special key
  - Intermediate frequent actions:
    ribbon menu, pull-down menu, key combination (Ctrl+S)
  - Infrequent actions: Sequence of menus or dialogs
- Problem – if many (all) actions occur with very similar relative frequency…

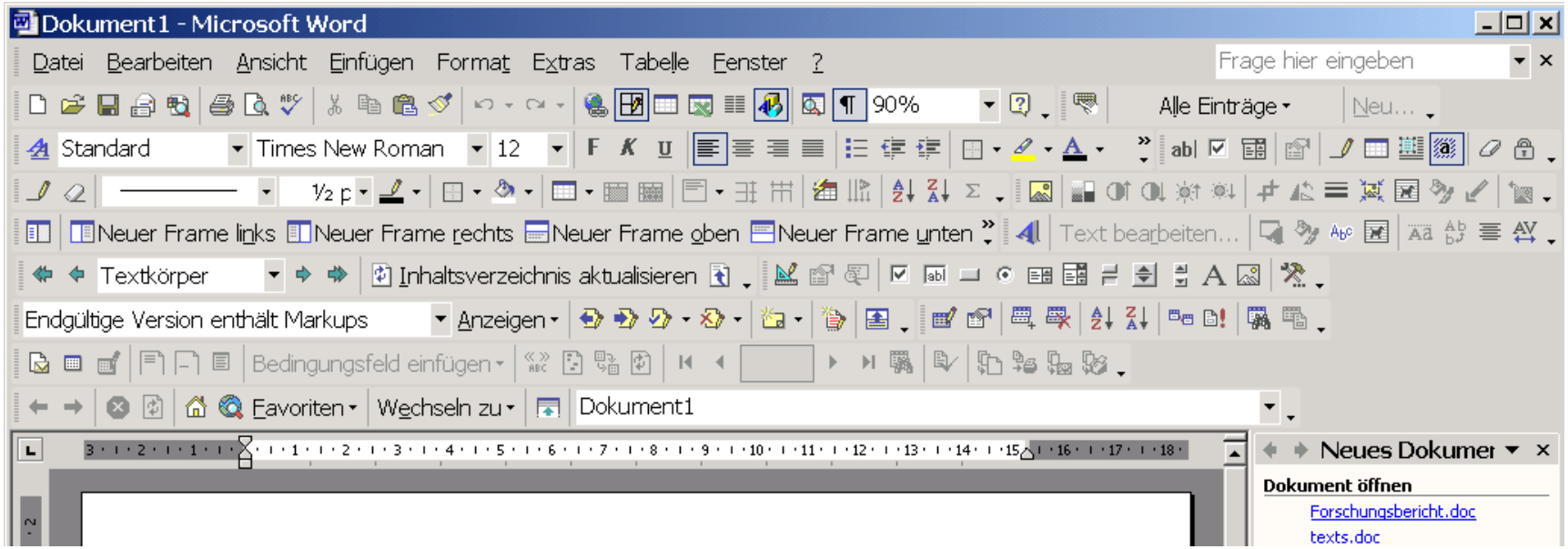
Task Frequency Analysis

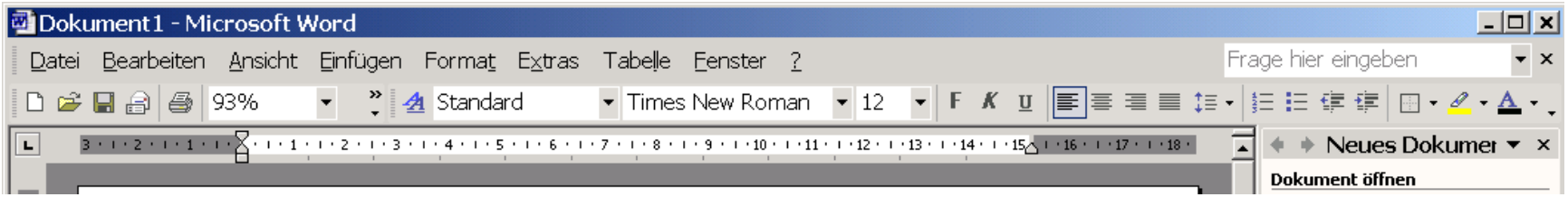
Example: Bold is more commonly used than subscript



Task Frequency Analysis

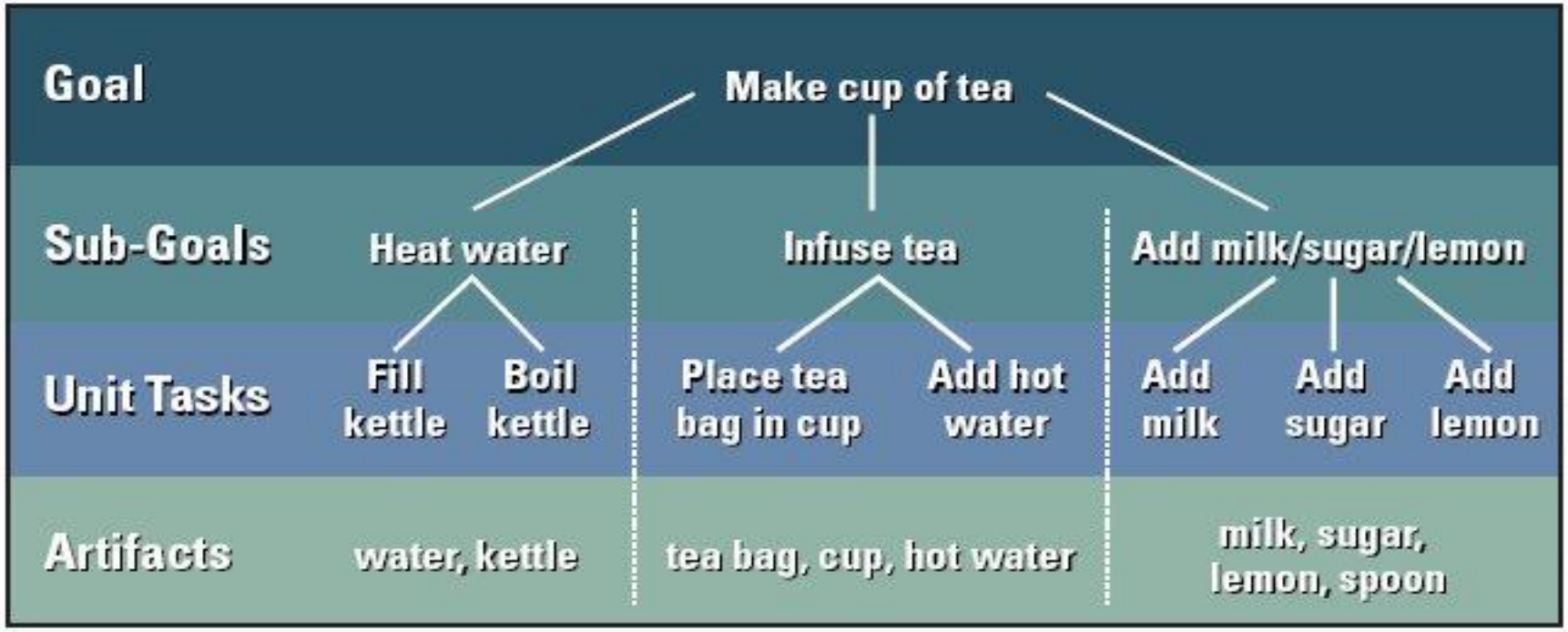
Trade-off between quick access and over-crowed interface





Hierarchical Task Analysis

Understanding what it takes to complete a task



William Hudson. HCI and the Web: a Tale of Two Tutorials: a Cognitive Approach to Interactive System Design and Interaction Design Meets Agility. *ACM interactions* 12(1), 2005, 49-51

Where is the Average User?

- There is no such thing as an average user!
- Usage of Persona
  - Typical users but not the average

- Number game…
  - Creating a software that is appropriate for a very specific target group (e.g. 0,1% of the population) may still find a large user base, e.g. in Europe and the US this may be more than half a million people
  - Designing for 90% of the users will leave alone in Germany 8 million users out

Persona

Creating realistic and prototypical users

- “Software today is too often designed **to please too many users**, resulting in **low user satisfaction**.”
- “choose the right individuals to design for […] and then to prioritize these individuals so that the needs of the most important users are met”
- “Personas provide a powerful tool for communicating about **different types of users and their needs**, then deciding which users are the most important to target in the design of form and behavior”
- “Personas represent groups of users”
- Typically 3 to 12 personas

Cooper, A., Reimann, R., & Cronin, D. (2007). About face 3: the essentials of interaction design. John Wiley & Sons. p.80ff

Why Persona

Creating realistic and prototypical users

- “Avoiding the “elastic user”
  - If you do not specify the user you can change their abilities to support a design decision made = “elastic user”
- Avoiding self-referential design
  - The designer or developer often assumes (implicitly) that users have his goals and his skills and abilities.
- Generally, make requirements concrete
  - Seemingly unnecessary detail helps in making the requirements accessible and understandable for a large audience (users, managers, developers)

Cooper, A., Reimann, R., & Cronin, D. (2007). About face 3: the essentials of interaction design. John Wiley & Sons. p.80ff

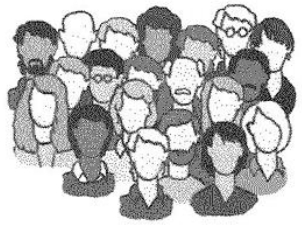
https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/personas

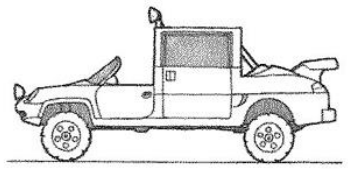
Personas for Car Design

Example from A. Cooper et al.

- Personas and goals
  - Alesandro (fast and fun)
  - Marge (safe, comfortable)
  - Dale (big loads, reliable)
- Results in 3 designs that differ, e.g.
  - Porsche
  - City SUV
  - Pick-up
- Average

  A car that is:
  - fast, fun, safe, comfortable, for big loads, and reliable
- The car that fulfils all requirements, will not fulfil them well…



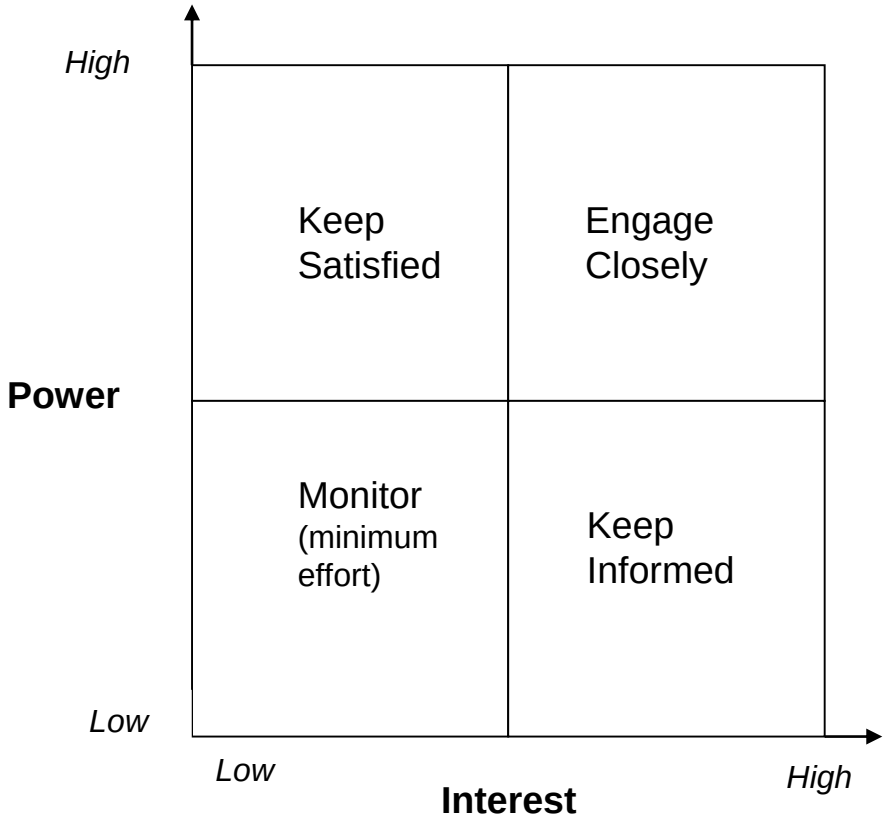


Cooper, A., Reimann, R., & Cronin, D. (2007). About face 3: the essentials of interaction design. John Wiley & Sons. p.80ff

Stakeholder Analysis

Who is interested in the system?

- Identify stakeholders, e.g.
  - Customers, team members, investors, management, suppliers, public, press, shareholders, government, community, sales partners, family, …
- Categorise stakeholders
  - Interest in the project?
  - Influence on the team and project (Power)
  - Attitude (positive / negative)
  - Reasons for attitude
- Force-field analysis
  - Place people in the diagram
  - Revisit throughout the project



https://www.mindtools.com/pages/article/newPPM_07.htm

Mendelow, Aubrey L. "Environmental Scanning-The Impact of the Stakeholder Concept." ICIS. 1981.

Did you understand this block?

Can you answer these questions?

- Why it is important to know the goals and tasks of the users?
- Alan Cooper argues “Software today is too often designed to please too many users, resulting in low user satisfaction.”. How can Persons in the design process help to address this problem?
- Conduct a task frequency analysis for a smart TV that is shared by a family
- Explain what personas are.
- Why is it not useful to design for an average user?
- Conduct a hierarchical task analysis for a taking a photo with your phone and posting it on Instagram.

Reference

- Wilfred J. Hansen. 1971. User engineering principles for interactive systems. In Proceedings of the fall joint computer conference. http://doi.acm.org/10.1145/1479064.1479159
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