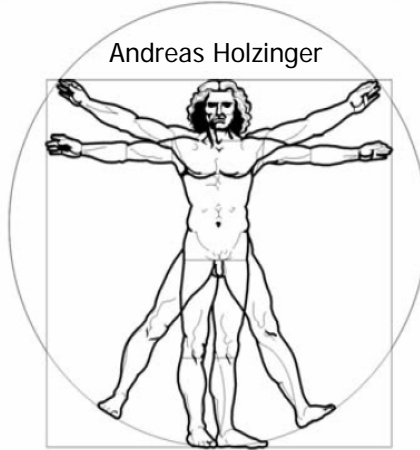TUG

Andreas Holzinger

LV 706.046 3SE AK Mensch-Maschine Kommunikation
Usability Engineering for Software Developers

Applying User Centered Design

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Welcome

Thank you for choosing this Seminar

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Our Goals

- ■ Introductions
  - ● Background analysis
  - ● Go over syllabus
  - ● Finding potential project teammates...

- ■ User-centered design and usability
  - ● Parallel on demand lectures
  - ● Practical Activities
  - ● Revisit syllabus – Focus on readings

- ■ Project
  - ● In Group of three people (magical number)
  - ● Group formation and project selection

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Grading

**■How to get a (positive) grading
Part 1+2 (70 %): Project Presentation + Paper**

- ■ Doing a project work in groups of 3 people and proceed in conference contribution style
  - ● Select a project idea
  - ● Work on the project together
  - ● Write a paper together (max. 3 authors)
  - ● Submit to Committee (peer review)
  - ● Presenting the paper in plenum
  - ● Discuss

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■**How to get a (positive) grading
Part 3 (30%): Written Examination**

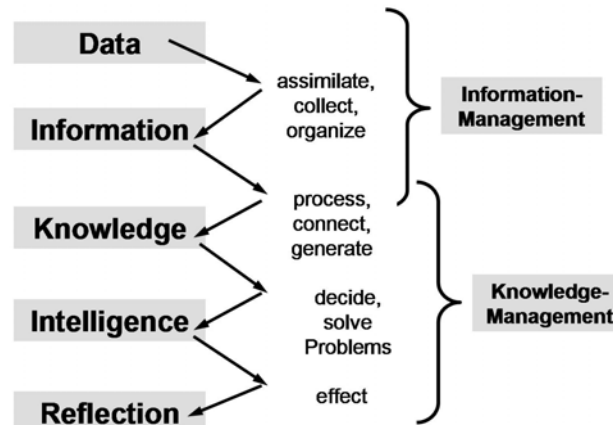■ Answering questions of UCD Theory
- ● Dichotomy YES/NO Decisions
- ● Multiple Choice
- ● Open Ended Questions

Harsdoerfer (1607-1658)

Refer to Holzinger (2001)

PLEASE CONSIDER: Learning is a basic cognitive <u>process</u> … not an object...

Data → assimilate, collect, organize } Information-Management

Information

Knowledge → process, connect, generate

Intelligence → decide, solve Problems } Knowledge-Management

Reflection → effect

Skinner (1954), Gagné (1965), Holzinger (2000)

Teacher-Centered

"Knowledge" (BEWARE!)
is transmitted from teacher to student

Learner-Centered

Students construct Knowledge (Yes!) through gathering and synthesizing information and integrating it with the general skills of inquiry, communication, critical thinking and problem solving.

TC versus LC (2) TUG

Teacher-Centered

Emphasis is on acquisition of knowledge outside the context in which it will be used.

Learner-Centered

Emphasis is on using and communicating knowledge effectively to address enduring and emerging issues and **problems in real-life contexts.**

Holzinger & Motschnig-Pitrik (2005)

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Syllabus – Course Design Principles TUG

Course Design principles

1) Assumptions

- Learning aims to the construction of KNOWLEDGE
- Every student is diverse with different background
- Students have a lot of preliminary knowledge to bring in class

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Course Design principles

2) Fundamentals

- Provide varied ways for students to learn & demonstrate knowledge
- Ensure students have opportunity to learn from **each other**
- Manage participant burden

Course Design principles

3) Elements

- Practice User-Centered Design activities
- Reflect on UCD activities through discussions
- Learn from perspectives of others
- Various interactions (work together, present, summarize, discuss ... **synthesize**)

- [Pre-1975]:
  - ● Computing systems with specialized interfaces, expert users,
  - ● Severe limitations in terms of interface, computing power stands in foreground!

Computers enter the hospital: 1960

- Information is still gathered manually
- Massive storage and quick retrieval
- Very limited 'sharing' due to restricted network and proprietary systems
- Used mostly for accounting functions

- 1977: Release of Apple II with graphical interface
- 1985: Gould and Lewis promote User-centered Design
- 1988: Norman and Draper, *User-centered System Design*
- [1990's] –
  - Interest in field methods,
  - Rapid increases in computing power and options,
  - Emergence of prototyping tools,
  - Global marketplace,
  - Internet...
- 1999: ISO standards for human-centered design
- 2001: FIRST Special issue IJHCI, Human-centered design

- **Usability** is the typical way a product is *evaluated*

- **Usability Engineering (UE)** is all encompassing to *enable good Usability*

- **User-centered design (UCD)** is one approach of UE to incorporate the end-user in design and development (User-centered development)

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XP + UE = XU

Holzinger, Errath, Searle, Thurnher, Slany (2005)

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Audience Analysis

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■ "Know thy end-users"

■ Common dimensions include
- Role – Dominant persona of users (job, affiliation)
- Goals – Reason for the interaction
- Circumstances of Use – Setting, resources, strategy, timing
- Culture – Group level beliefs, language, preferences
- Ergonomics – Relevant perceptual & motor abilities, skills

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User Centered Design

■ Know thy end-users!
- Cognitive abilities
- Physical abilities
- Motivational background
- Previous knowledge and skills!

■ Keep users involved throughout the development process ...

Tell about yourself

Please record the following information clearly on an index card:

■ Name
(or preferred way to address you)

■ Best way to contact you
(e.g. email, phone ... etc.)

■ Domains of interest
(e.g., medicine, e-commerce ... etc.)

- Medicine/health: Gig, Thomas, Daniel, Conny, Bernd, Toni, Sabine,

- Public: Markus, Verena, Christian,

- Communications: Thomas

- Civil Engineering: Martin1

- Media: Gernot, Martin2, Toni, Hans-Peter, Martin3, Peter2, Sabine, Peter, Chrissi,

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- <u>Self-characterization</u>: Indicate your level of agreement with the following statements by recording *low, medium,* or *high* for each:
  - I consider myself a designer
  - I consider myself adept at incorporating user considerations into my work

Getting a sense of the class…

Already are designers …

	Low	Medium	High
High	0	4	5
Medium	0	4	5
Low	0	0	0

Adept at prioritizing user issues…

Task 1

■<u>Design process</u>: Write down the sequence of five major steps one should go through in developing and evaluating a new software system for end users

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- Zenz, Singer und Zangl:
- 1. Zielgruppe / Anforderungen
- 1a. Erwerb von Domänenwissen, Contextualisation
- 1b. Abgleich Anforderungen Benutzer / Auftraggeber
- 2. Prototyping
- 2a. Auftrennung von Logik und Benutzerinterface
- 3. Modifikation / Redesign
- 4. Usab. Tests
- 5. Implementierung

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Task 2
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- <u>Techniques</u>: What techniques do you use (have you used) to focus on end-users in your work?

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- Evaluation criteria:
- What criteria would you use to evaluate
- a) a hair dryer

- Preis
- Leistung (Luftdurchsatz, Wärme, Kälte)
- Einstellungsmöglichkeiten
- Größe / gewicht
- Ergonomie /Geräuschentwicklung
- Kabellänge
- Optik
- Sicherheit
- Verarbeitungsqualität
- Spannung umschaltbar
- Erweiterungsmöglichkeiten
- Intuitive Steuerung ;)
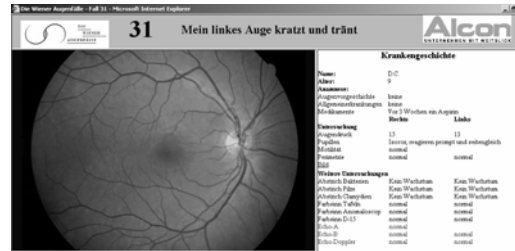
- Evaluation criteria:
- What criteria would you use to evaluate
- b) a Web site for Online Health Resources

- Aufteilung in wissenschaftliche Bereiche
- Grundsuchfunktionen: Körper(-teile)
  3D-Ansichten, Krankheiten, Medikamente,...

Weltkarte zum Anklicken (Reiseempfehlungen
  z.B. Impfungen)

Multimedia-Archiv (Audio, Bilder, Video)

Empfehlungen für weitere Ansprechstellen
  (Ärzte, Krankenhäuser,...)

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- Benchmarks gegen die Evaluiert werden kann:
- Vertrauenswürdigkeit
- Accessbility
- Scalability (Skalierbarkeit/Tiefe der Inhalt)
- Harmlosigkeit
- Arzt-Deutsch Übersetzung
- Regionalisierung/Adaptivität

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- Evaluation criteria:
- What criteria would you use to evaluate
- c) an Hospital Information System (HIS)

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