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Mobile Computing in Medicine: Designing Mobile Questionnaires for Elderly and Partially Sighted People

Linz, 12.7.2006, 11:00



10th International Conference on Computers

Helping People with Special Needs

July 12-14, 2006,

University of Linz, Austria

- *"Human-Computer Interfaces should not only support more effective and efficient user interaction, but also address the individual end-user requirements and expectations in the variety of contexts of use to be encountered"*
(Constantine Stephanidis, 2001)

- To gain most benefits for the end-users, it is essential to combine research in Psychology TOGETHER with research in Computer Science ... however, the results must be implemented at systemic level ... consequently the combination of Psychology and Computer Science is a MUST.



- At the clinical department of Dermatology (MUG), approx. 30 outpatients consult the pigmented lesion clinic each day.
- During the visit, the patients are asked to complete a questionnaire, which is necessary, both for the clinical information system and for a scientific database for research in skin cancer.



- Also the possibility of completing questionnaires on different locations, for example: during a cancer survey even in the open-air swimming resort.

The image shows two versions of a questionnaire. The left one is a standard paper-based form with multiple-choice questions. The right one is a digital version of the same questionnaire, overlaid on a colorful, pixelated image of a person's head and neck, with a small human figure diagram below it.

- Motorically and visually handicapped people usually have problems in completing paper based questionnaires (cf. e.g.
- -> system, using a mobile touch computer with a specially designed interface, in order to assist these people and to allow full mobility within the clinical department.

- The system was developed by applying a User Centered Design including four levels: paper mock-up studies, low-fi prototypes, hi-fi prototypes and the system in real life.
- Scientifically this work
- provided insights into the technical possibilities, Human-Computer Interaction
- and Usability Engineering, user acceptance in the clinical field and the possible
- optimization potential of clinical workflows.



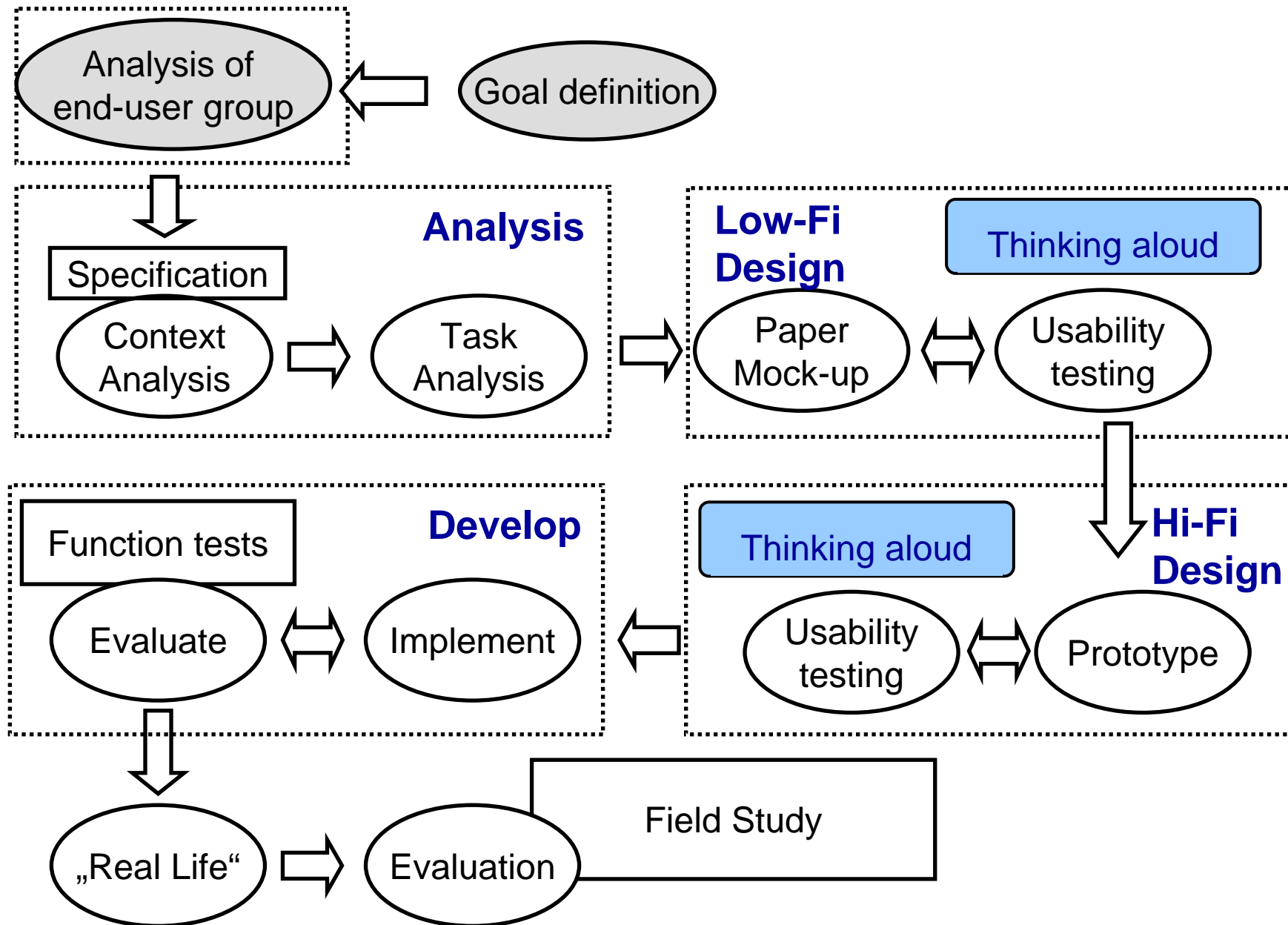
Technology Centered Design

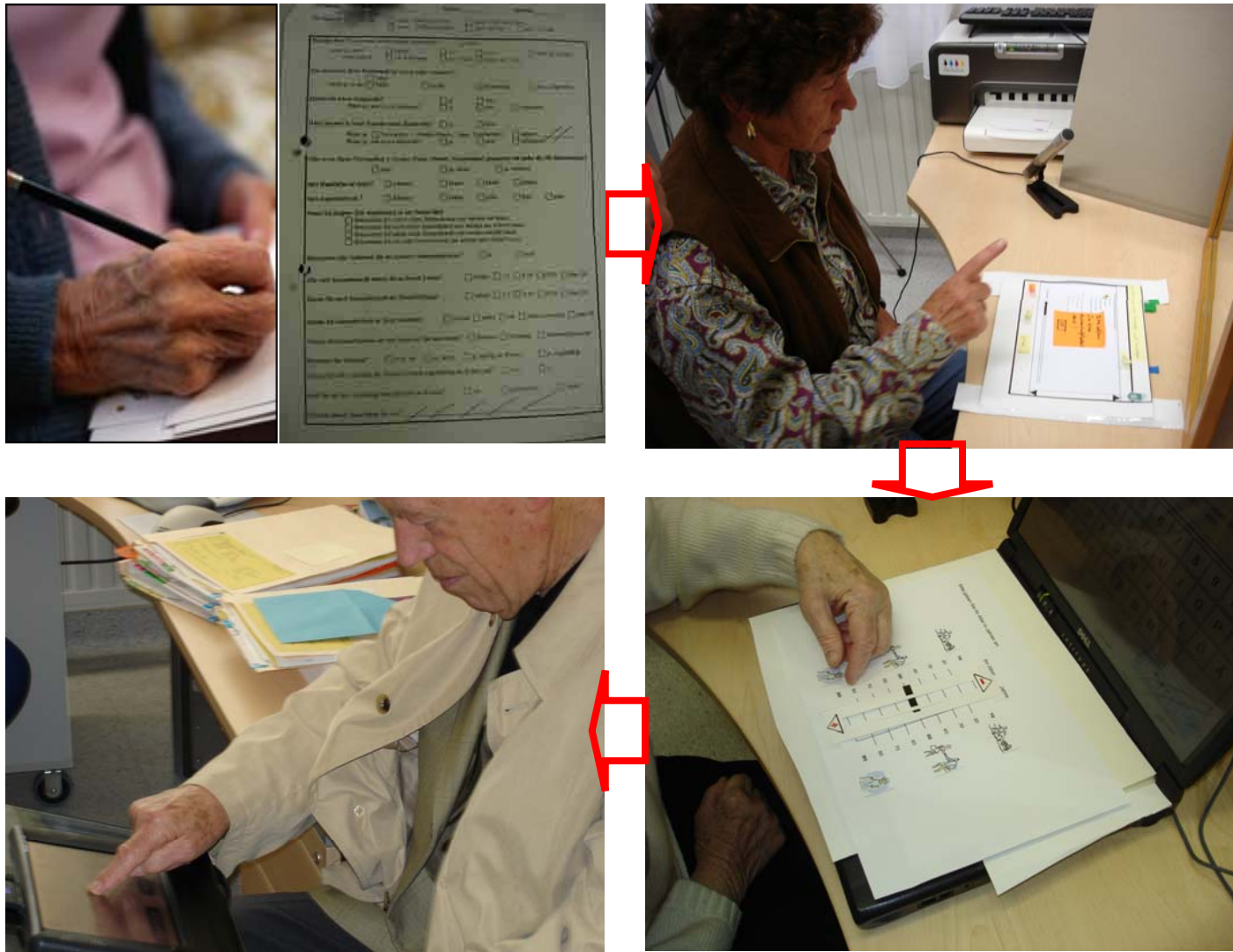
- **Feature driven:**
What can be realized on our platform?
- **Tool driven:** What can be created by using available tools?
- **Interest Driven:** What do the programmer find interesting?

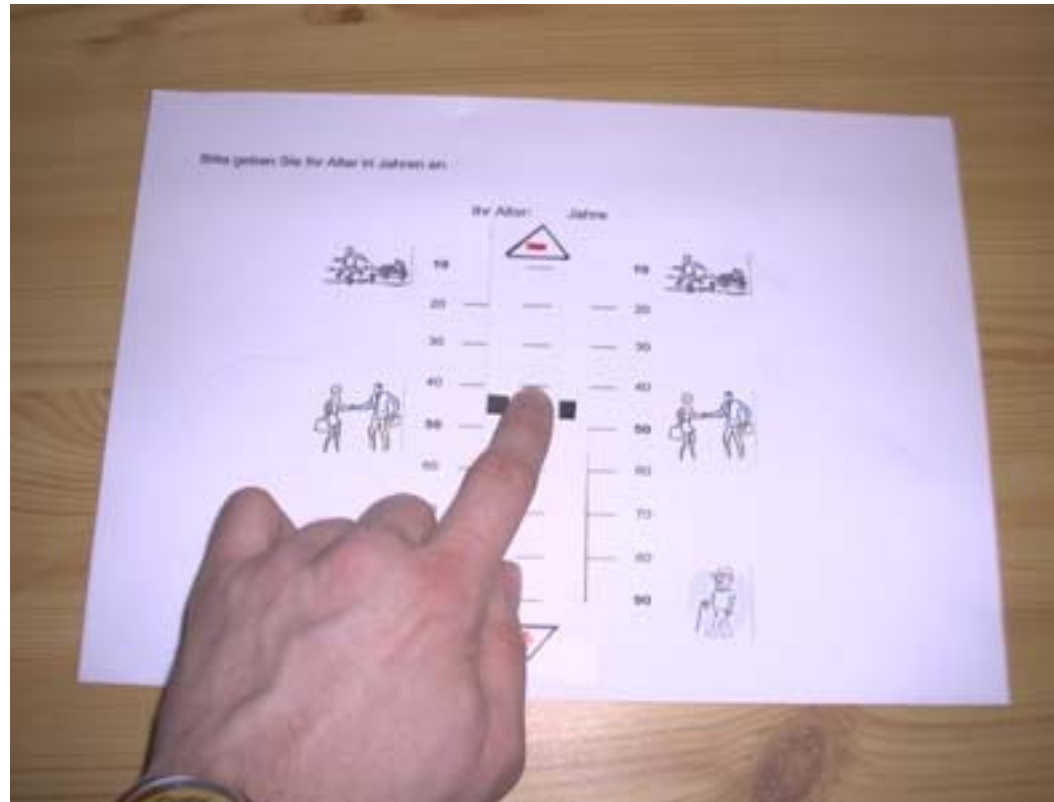
Learner Centered Design

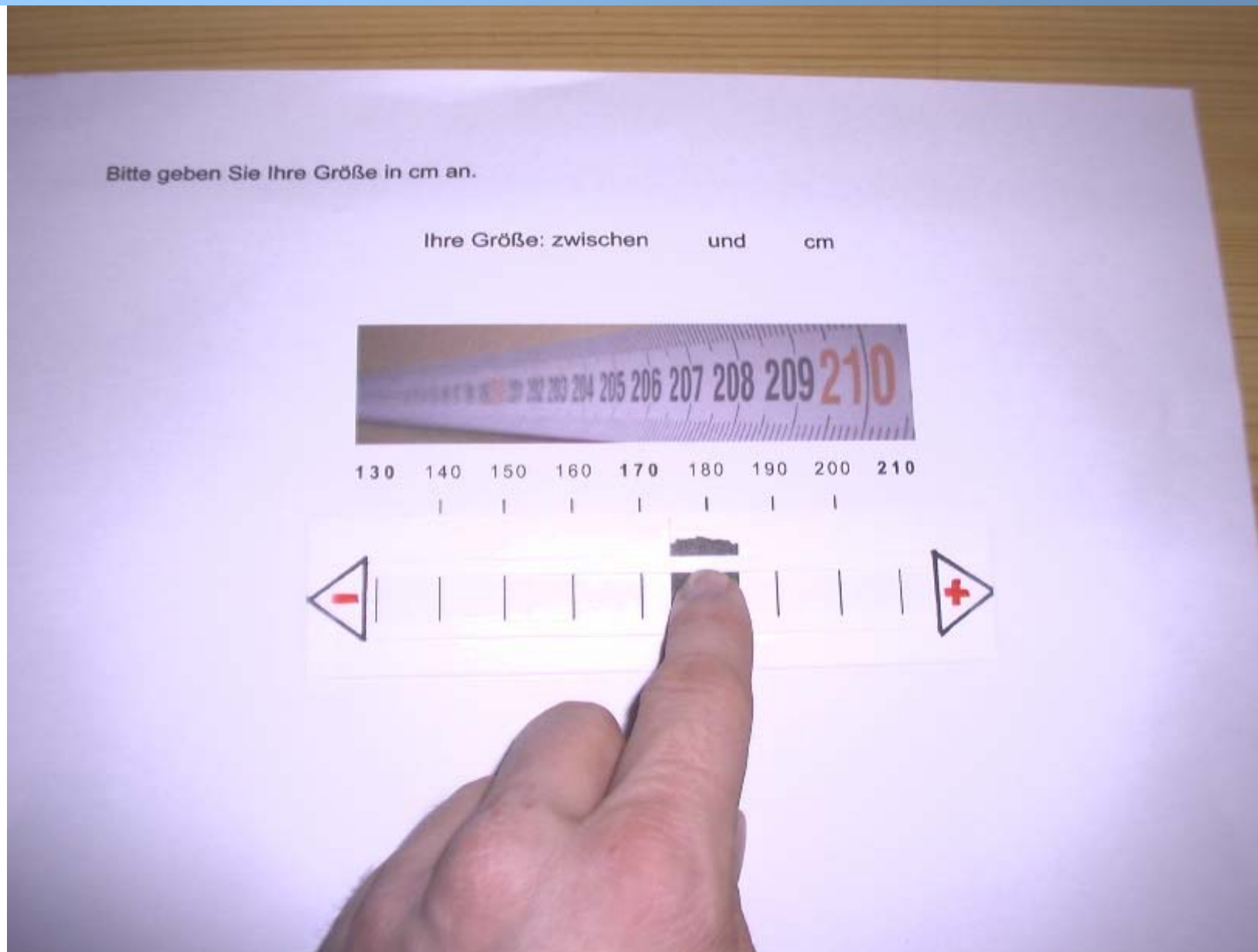
- **Task based:**
What do the learners really need?
- **Ability based:** What abilities/knowledge do the learners have?
- **Domain based:** In what context do the learners learn?

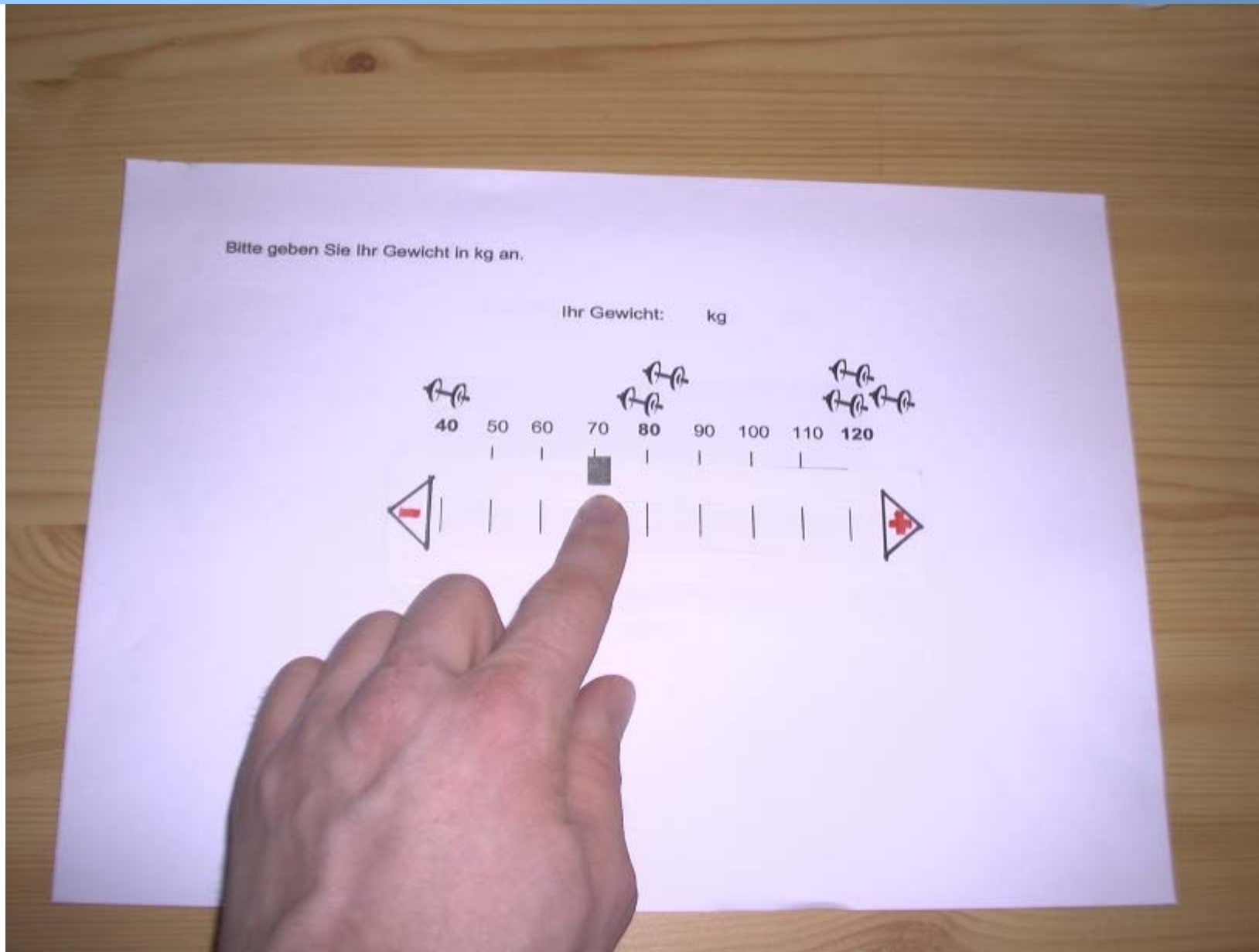
Norman & Draper (1986); Soloway, Guzdial, Hay (1994); Holzinger & Motschnig (2005)





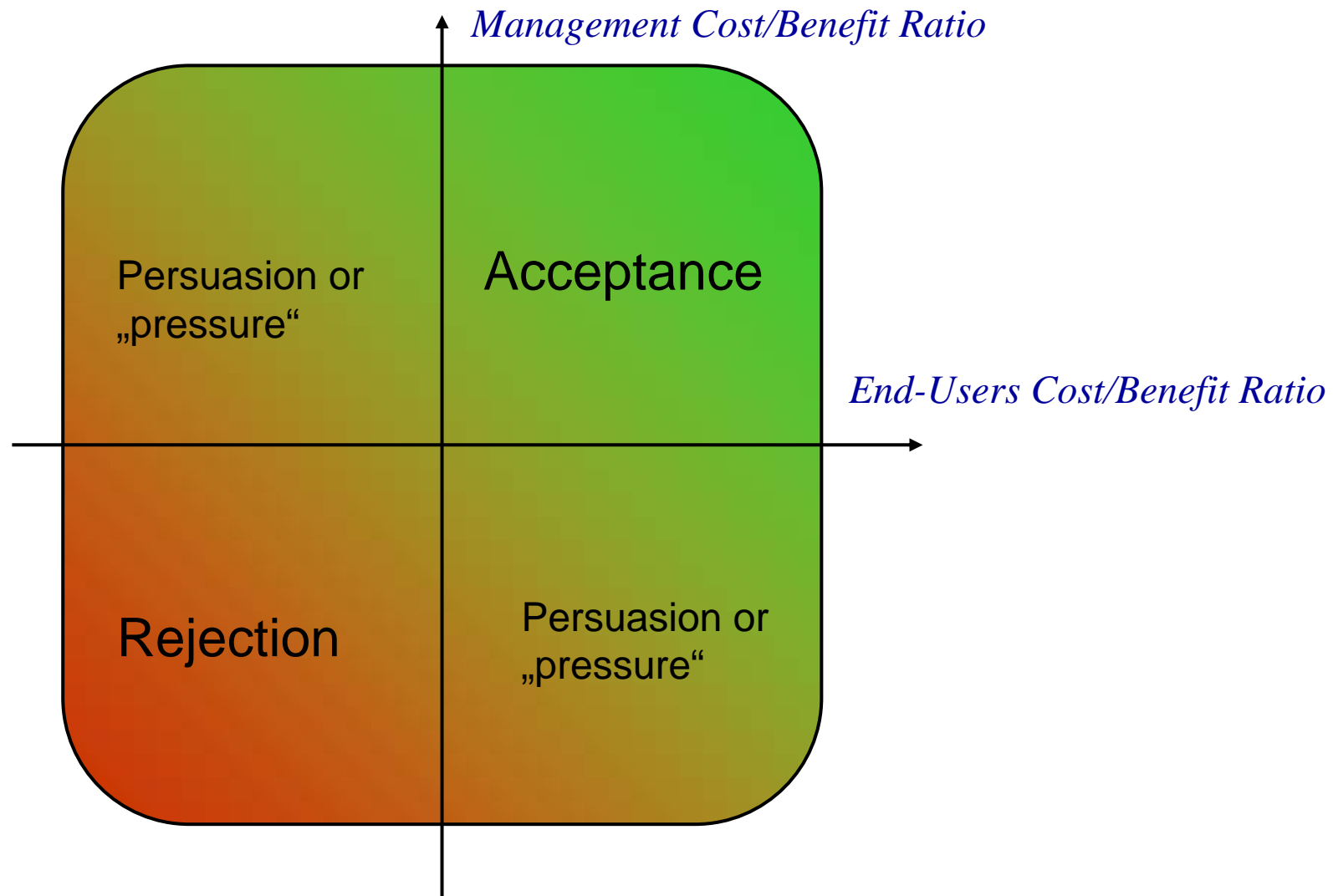








- Paper Mock-ups allowed EARLY insights into the behavior of elderly end-users
- Lessons learned could be immediately brought into the next prototyping stage
- Thinking aloud proved again as very valuable method, although difficult to maintain thinking of this particular end-user group
- Consistence! (Whatever you do, be consistent) Large! Simple!
- Clearly marked “emergency exit”



ONLY, if BENEFIT for all people involved!



- Thank you!
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