

The usability toolbox of the Hörzentrum Oldenburg

Personas may be used as part of a user-centered design process for designing software products and are also considered a part of interaction design and industrial design. A user persona is a representation of the goals / behavior of a hypothesized group of users. In most cases, personas are created by interviews and focus groups with users. They are captured in short descriptions that include a picture, behavior, goals, skills and attitudes, and environment, with a fictional personal details to make the persona a realistic character e.g., for the developer of a product or software solution.

Focus groups. The focus group is a special type of group in terms of purpose, size, composition, and procedures. A focus group is a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, nonthreatening environment (Krueger 1994). Focus group analyses belong to the most common techniques we use when investigating the market for audiological and acoustic products. Using this method, several groups are interviewed on innovative topics during moderated sessions. The meetings are recorded visually and audibly for subsequent qualitative analysis with "Focus Group Illustration Maps" (Pelz, Schmitt & Meis, 2004).

Contextual Inquiry. Contextual inquiry is method, derived from ethnography and is part of the Contextual Design methodology. A contextual inquiry session is usually structured as an approximately two-hour, one-on-one interaction in which the researcher watches the user (video based or written protocol) do their normal activities and discusses what they see with the user. We used a special method to observe behavior depending from the fitting of the Hearing aids following the Ground Theory approach (Glaser & Strauss, 1967) in quasi-experimental and field settings.

Cognitive Walkthrough (CW). Cognitive Walkthrough is a task related method (Polson et al. 1992), wherein experts are analyzing functions of a system on the basis of a description of the interface, task and lists of actions, which are necessary to fulfill the task to gather information of the user and usage context.

A Heuristic Evaluation (HE) is a usability inspection method for products or software that helps to identify usability problems in the user interface design. It specifically involves evaluators

examining the interface / product and judging its compliance with recognized usability principles (the "heuristics"); Nielsen et al. 1994. It is easy conduct and needs no end-user inclusion and it will be used by experts and developers.

Creative workshops. In the beginning of a project it is useful to conduct creative workshops, such as the Morphological Box (Zwicky, 1966). Morphological analysis was designed for multi-dimensional, non-quantifiable problems where causal modeling and simulation do not function well or at all. Other methods are mindmapping and brainwriting (Method 635, Rohrbach, 1969). In sum 4-8 persons, patients/end-users as well as experts can participate at the workshops to find new ideas and concepts of technologies or software solutions.

Wizard-of-Oz experiments. Wizard-of-Oz experiments describes a testing or iterative design method, wherein an experimenter (the "wizard"), simulates the behavior of a theoretical intelligent computer or device application in that case, when no functioning prototype is not available (Carroll & Aaronson, 1988).

Thinking aloud method (retrospective, concurrent). Thinking aloud protocols involve users thinking aloud as they are performing a set of specified tasks. Users are asked to say whatever they are looking at, thinking, doing, and feeling while task completion. This enables observers to see first-hand the process of task completion. The purpose of this method is to make users thoughts and concepts explicit when performing a specific task.

Error analysis by video observations. Frøkjær/Lárusdóttir (1999) stated that a usability problem is cosmetic, if the problem imposes just a slight inconvenience, severe, if the user's performance is substantially impeded, whereby the problem has a significant influence on the task or satisfaction, and critical, if the user is not able to finish an on-going operation. Along with a coding system this error will be analyzed by raters, using video tapes. Besides the errors we also measure the time for fulfilling the tasks. We are using Mangold Interact for data analyses.

Questionnaires. There are several questionnaire in international usage for usability, e.g. the System Usability Scale (Brooke, 1996). The SUS consists of 10 items. Ratings are performed on a 5-point scale on which 1 corresponds to "strongly disagree" and 5 to "strongly agree". The evaluation results in a score from 0 – 100.

Patient's Profiling for usability tests

Besides an auditory profile of the patient, we need other not hearing related aspects of the patient's profile

- Measurement of dexterity and visual impairment. We are using are a screening test battery for dexterity and visual impairment by means of the and Purdue Pegboard Test (Desrosiers et al.,1995) and the Landolt C test, the Visual Acuity C-Test.

- Technology commitment. A questionnaire to measure technology as a predictor of technology usage. It was developed for profiling users to gather information about concerns, special needs, and requirements of elderly people concerning the implementation and usage of assisting systems, like hearing aids. German Norm data are available for 50+ users (Neyer et al., 2012).
- Cognitive Screening. We are using the DemTect for a cognitive screening procedure (Kalbe et al 2004). The DemTect includes five short, easy to administer tasks that are sensitive for diagnosing dementia (word list; delayed recall of word list; number transcoding; semantic word fluency task; digit span reverse). It is possible to screen normal cognitive status, mild cognitive impairment, and dementia. A similar test in international usage is the Montreal Cognitive Assessment (MoCA) with seven scales of cognitive functions (Nasreddine et al, 2005).
- List of further diseases, such as cardio-vascular diseases, cancer, mobility problems Parkinson disease etc.

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