

U-WISH

Attuning Network User Interfaces to individual capacities: User requirements and support concepts

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Summary

In the U-WISH (Usability of Web-based Information Services for Hypermedia) project, three research institutes and four companies that provide Web-based services are developing a cognitive engineering method focusing on the enhancement of individual navigation performance in the services such as the performance of elderly. This report provides a state-of-the-art overview of the cognitive theory and design principles for Web-navigation to be used in the UWISH tutorial “Usability techniques for Web-based services: diversity and technology”. First, a theoretical basis for navigation performance in Web-environments is proposed. The crucial cognitive factors that affect effectiveness, efficiency and satisfaction in navigation tasks are spatial ability, task-set switching capacity, and situation awareness. A higher spatial ability of users proves to correlate with better navigation performance in Web-environments. Switching between tasks is often required for optimal task management and interleaving is an important aspect of human-computer interaction. Task-set switching can be relatively demanding due to an increase in memory load, resulting in a decrease of performance. Situation awareness comprises a person’s momentary knowledge of the surroundings and his or her presence in it. This knowledge can be described at three levels: the *perception* of the elements in the environment within a volume of time and space, the *comprehension* of their meaning, and the *projection* of their status in the near future. Better situation awareness results in better Web-navigation and less effort.

Based on this practical theory, user requirements for navigation support are identified and mapped on the support functions that current Network User Interface (NUI) technology provides. Subsequently, new promising support concepts are synthesised and designed. The three concepts for navigation support functions are categorising landmarks, a history map and a navigation assistant. Categorising landmarks are cues that order information into categories that are meaningful to the user and will aid the user at the level of perception. A history map is a representation of the web site structure in which history information is integrated. This will aid the user at the level of comprehension. The navigation assistant, finally, has knowledge of the domain and the user. With this knowledge the assistant is able to provide advice to the individual user. The navigation assistant will aid the user at the level of projection. An example design of a navigation assistant is provided. By enhancing situation awareness these three support concepts should compensate for the possible individual lack of spatial ability or memory capacity of a user (e.g. an elderly). Experiments will follow to test if this compensation effect will really show up.