CENTER FOR Human-Information INTERACTION

Fact sheet

Cognitive Work Analysis – in brief

Cognitive Systems Engineering

Traditional human-computer interaction (HCI) and system design models have proven too narrow to adequately assess user needs and to design usable and efficient computer-based information support systems. Taking modeling concepts from engineering, psychology, cognitive science, information science, and computer science, cognitive systems engineering (CSE) provides a much broader, more dynamic framework. This approach is concerned with the design of information systems for support of people in their actual work situation based on a systematic analysis of their cognitive tasks and their mental strategies. The Cognitive Systems Engineering approach is different from the traditional HCI approach having its focus on the human-work interaction as mediated by a computer rather than on the human-computer interaction.

Cognitive Work Analysis

The Cognitive Work Analysis framework analyzes the work people do, the tasks they perform, the decisions they make, their information behavior, and the context in which they perform their work - all for the purpose of systems design. The framework is one of the few tools that offer a mechanism to transfer results from an in-depth analysis of human-information work interaction directly to design requirements. The framework was developed in the 1970's at the department of System Analysis at Risø National Laboratory in Denmark, to facilitate the human-centered design of technologies that people use in their work. It is very important for the design of information systems and technology because of the rapid development of technologies of all types. With all these developments we see an increasing number of recorded failures, because these technologies were not designed to fit the work practices of their users. Currently this framework is the only method that facilitates the analysis of tasks and context simultaneously.

Cognitive Work Analysis is useful for the study of human-information interaction and for the design of information systems and services because

- It provides for a holistic approach that makes it possible to account for several dimensions simultaneously.
- It facilitates an in-depth examination of the various dimensions of a context. A study of a particular context is, therefore, an interdisciplinary investigation with the purpose of understanding the interaction between people and information in the work context.
- It provides a *structure* for the analysis of human-information interaction, rather than subscribing to specific theories or models. One can employ a wide variety

of conceptual constructs or tools that may be deemed helpful for the analysis of a specific situation. This flexibility turns the focus of an investigation to the situation under study, rather than to the testing and verification of models and theories.

These attributes, and others, make the framework a powerful guide for the evaluation and design of information systems and services for specific situations because in reality all facets—personal, social, technological, and organizational—play a role simultaneously and interdependently.

The framework's theoretical roots are in General Systems Thinking, Adaptive Control Systems, and Gibson's Ecological Psychology, and is the result of the generalization of experiences from field studies which led to the design of support systems for a variety of modern work domains, such as process plants, manufacturing, hospitals, and libraries.

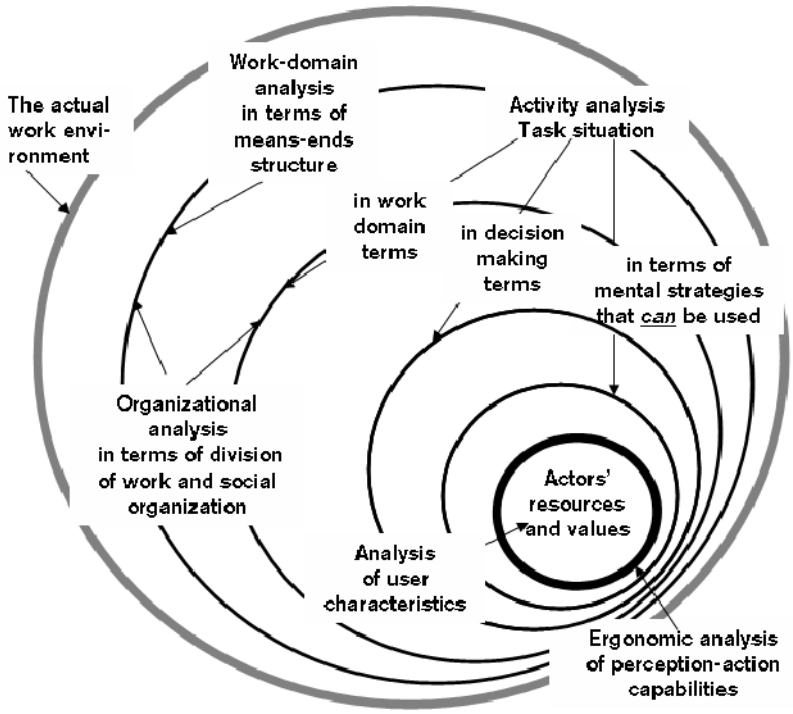

Figure 1. The dimensions for analysis in Cognitive Work Analysis

Read more:

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