Carsten Tautz: **Customizing Software Engineering Experience Management Systems to Organizational Needs**

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Kurzfassung:

The increasing internationalization of world trade intensifies the global competition forcing organizations to accelerate their technology changes and product innovations. Software development organizations are not exempted from this trend as software plays an increasingly important role for the value of products and services. The systematic acquisition, utilization, and maintenance of software engineering experience accelerates goal-oriented changes in software development practices. Thus, it has become a major competitive advantage.

Explicit software engineering experience is stored in a repository called the experience base. This dissertation presents a methodology based on the principle "learning from examples" for designing and implementing an experience base that contains all kinds of experience. The methodology consists of:

- A new knowledge representation formalism for experience base schemas. The formalism fulfills many practical needs (e.g., rationalized schemas and support for uncertain, imprecise, incomplete, and context-dependent information) for the first time. As such, it uses many features typically associated with case-based reasoning systems as well as ideas from other areas such as database systems.

- A generic architecture for the comprehensive tool support of an experience base. The architecture considers many practical needs such as the integration of already existing tools and learning in distributed environments.

- A generic task framework. The framework is the most comprehensive description for incremental, continuous learning (of all kinds of software engineering experience) based on a repository to date. Its description is based on the knowledge-level approach and, hence, implementation-independent.

- A systematic, goal-oriented method for setting up an experience base. The method describes how to engineer experience base schemas as well as how to tailor the generic architecture and instantiate the task framework to organization-specific needs. It is unique in the sense that its application does not only provide a schema, but also matching methods for populating (and updating) the experience base on the basis of the developed schema.

Systems designed using this methodology will provide faster and more effective access to software engineering experience available in an organization compared to existing solutions (usually a combination of "asking colleagues" and consulting lists and databases accessible over the intranet).

The methodology is complemented by a goal-oriented method for improving the technical infrastructure of a running experience base from a user's point of view.

The components of the methodology have been validated in several industrial- strength projects including Fraunhofer IESE's Corporate Information Network, which is presented in detail. A prototype for the tool architecture has been built using a commercially available case-based reasoning system as its modeling tool and retrieval engine.