Software Engineering Decision Support/Strategic Software Engineering

Rick Kazman, Dan Port
University of Hawaii
{kazman,dport}@hawaii.edu

Guenther Ruhe
University of Calgary
ruhe@ucalgary.ca

1. Introduction
The focus of this minitrack is based on two related topics: Strategic Software Engineering (SSE) and Software Engineering Decision Support Systems (software engineering-DSS). By these topics, we are referring to the application of integrated strategic decision-making techniques to the software development process, and to software decision-making.

2. Strategic Software Engineering
A strategic decision (as opposed to a tactical one) is one that helps plan for and achieve particular project-wide cost, schedule, and quality goals as they are subject to benefit, value, and risk factors. A strategic decision-making perspective is a crucial foundation to any mature business process (software or otherwise), because it helps to set a context in which rational tactical decisions can subsequently be made.

This minitrack topic includes the application of a broad range of economic, managerial, and other non-technical models to support technical decision-making in software development. As such, it borrows and adapts ideas from a wide variety of related fields such as economics, management science, engineering, and human resource management:
- economic models of software development and return-on-investment decisions; effort estimation; value-based software engineering; portfolio management of software development projects
- allocation of project resources in constrained environments
- cost/schedule/benefit/quality estimations and processes
- “how much is enough” decisions e.g. how much inspection, testing, evaluation, etc. is enough
- COTS assessment, acquisition, and management
- project monitoring and control
- software product lines; reusable architectures and architecture frameworks
- software engineering decision-making processes and composable processes

3. Software Engineering Decision Support
Rules of thumb, intuition, tradition or gut feeling are no longer applicable to make such important decisions as reuse of artifacts, termination of testing, selection of techniques, or allocation of resources as part of software development and evolution. software engineering-DSS is an integrated effort to aid decision-making. It can also be seen as an extension and continuation of the experience factory and learning software engineering approaches. In addition to collecting, retrieving and maintaining models, knowledge, and experience in the form of lessons learned, SE-DSS generates new insights from pro-active analysis and evaluation of possible decision scenarios.

What are the expectations from systems offering decision support in the process of software development and evolution? We define a set of "idealized" requirements on support systems that combine the intellectual resources of individuals and organizations with the capabilities of the computer to improve effectiveness, efficiency and transparency of decision-making. Depending on the concrete problem topic and the usage scenario of the DSS different aspects will become more important than others:
- knowledge, model, and experience management in the problem area (e.g., for project cost estimates)
- integration of SE-DSS into organizational information systems
- process orientation of decision support
- process modeling and simulation to plan, describe, monitor, control and simulate the processes and to track changes.
- negotiation component to evolutionary achieve and understand compromises.
- presentation and explanation to present and explain generated knowledge and solution alternatives.
- analysis and decision support to evaluate and prioritize generated solution alternatives and to find trade-offs.
- knowledge discovery and approximate reasoning.
- group facilities to support electronic communication, scheduling, document sharing, and access to expert opinions.