

People, Interactions, and Scale [Position Paper for “Future Directions Panel”, ICSP1]

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There are three inter-related issues that are fundamental to the future of process modeling: the placement of the human in the model and the supporting environment; the creation and definition of interaction abstractions to support team efforts; and the scaling of the models and environments to support large projects.

SCALE. The issue of scale was raised at the 4th International Software Process Workshop (ISPW4, Moretonhampsted, England, May 1988). Evidently, we had not progressed far enough to seriously consider the effects and implications of scale and concentrated instead on language constructs and notation issues. The issue of scale is being raised again at ISPW7 (Napa CA, October 1991). It is hoped that we will at last confront the problems that arise from considerations of scale.

Current solutions to the problems of scale are composed primarily of small-scale processes “writ large” by the extensive additions of informal methodology and organizational structure. We have concentrated on automating the build process, but have given little thought to reducing the complexity of interactions among developers or managing the increased complexity of the software artifact. For example, formal descriptions of artifacts can be used as oracles to reduce many-many communication to many-few communication and also used, with appropriate supporting tools, to manage the increased complexity of those artifacts.

INTERACTIONS. One of the discussion sessions at ISPW6 (Hakodate, Japan, October 1990) addressed the problems of modeling team efforts. As with the problems of scale several years earlier, the discussion drifted to other issues. Again, the topic seems to have been premature.

We have a number of low-level facilities (such as triggers, messages, conversations, rule-chains, object relations, etc) that may serve as implementation mechanisms, but we have given very little thought either to interaction abstractions (such as consensus, notification, collaboration, etc) or to interaction abstraction definition mechanisms (such as laws and policies). Such interaction abstractions and the mechanisms to define them are crucial to developing novel processes, especially processes that are applicable to large-scale projects.

PEOPLE. In general our modeling approaches have concentrated on tool-tool processes -- that is, we have concentrated on how tools interact with each other and how we might automate those interactions. Using this paradigm and substituting humans for tools in the model results in a system that is both too restrictive and too inflexible.

What is needed is a modeling paradigm that emphasizes the problem solving nature of people and their ability to handle and recover from exceptional conditions. Such a framework provides guidance (rather than detailed prescriptions) and automated support for the various necessary interaction abstractions.