Collaborative Modeling: Roles, Activities and Team Organization

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ABSTRACT

In the area of business processes, modeling is usually a collaborative activity. In it, stakeholders analyze or design business processes; however, one of the challenges is that the group members typically have diverse backgrounds and conflicting interests, which make it difficult to arrive at a model that represents a consensus. Therefore, it is important to study the way in which modeling teams are organized to overcome these problems. To approach this issue, this paper investigates the modeling behavior of such groups with the help of a tool that supports collaborative modeling while allowing for the effective collection of data on modeling activities. This author identifies the roles that the participants play in that process and derive patterns of team organization. Structured observation yields a detailed process model concerning basic modeling activities.

Keywords: Group Modeling, Modeling Activities, Roles in Modeling, Team Structures, Tool-Supported Modeling

INTRODUCTION

The topic of this paper is to study collaborative modeling in the area of business processes. There is already a substantial body of literature in this area as reviewed in the next section. In this the process of modeling is portrayed as a highly organized activity that nevertheless often delivers poor results and low participant satisfaction. A central tenet in existing research is the importance of the facilitator’s role in modeling. He elicits the relevant information for model building from the domain experts that make up the group. There are different ways of doing this such as post-it notes, brown paper etc.) but in the end it is the facilitator who translates the information into a model. This is done because the task of modeling is assumed to be too sophisticated for unskilled people.

We challenge both the necessity of a highly organized process and the role of the facilitator. We do agree, however, that a facilitator is necessary but model building can, at least in parts, be done by the group members themselves. In this paper we make the assumption that the conventional modeling process forces people to work in a way that underestimates their capabilities and puts too much work load on the facilitator, thereby leading to participant frustration and poor output.

Rather than attempting to confirm the validity of this assumption in this paper, we explore the following questions:

• What happens if we drop the strict organization of conventional modeling sessions
and allow teams to organize themselves to a certain degree?
• Will it make a difference if we initially appoint a facilitator?
• Which roles emerge in self-organizing teams with and without a facilitator?
• Which structures emerge in self-organizing teams with and without a facilitator?

In the following, we first take a look at the existing literature on collaborative modeling. We then proceed with a description of our research methodology. After that we give a brief sketch of a new approach to modeling called COMA (COllaborative Modeling Architecture), which will be the basis for data collection. Data analysis is done in sections “Roles in Collaborative Modeling” and “Team Patterns in Collaborative Modeling”.

RELATED RESEARCH

Roles and Team Structures in Collaborative Modeling

In (Bommel et al., 2006) modeling involves domain experts, modeling mediators and model builders. It is seen as an information gathering dialogue where knowledge is elicited from the domain experts. (Hoppenbrouwers et al., 2005) acknowledges that modeling is not only a knowledge elicitation process but also a knowledge creation and dissemination process. We agree with the latter view and have therefore studied situations where the participants, apart from the facilitator, had no a priori roles.

(Frederiks & Weide, 2006) emphasizes the importance of natural language as the primary medium and identifies two principal activities and associated roles: the domain expert who concretizes an informal model and a system analyst who abstracts a formal model. A detailed process model of both activities is given. (Hoppenbrouwers et al., 2006) distinguishes between an elicitation and a formalization dialogue and develops a modeling procedure by generalizing existing procedures for specific modeling languages.

Another type of work is that on brainstorming that provides methods for creating rudimentary models in an unstructured problem area (e.g., Belton et al., 1997; Conklin et al., 2003). Our approach continues this work into the more structured phases of modeling.

Modeling Environment

Persson (2001) and Araujo and Borges (2007) look at the environment in which this process is embedded. They study the influence of situational factors on modeling. The authors’ aim is to create an environment that facilitates participative modeling in enterprise or software engineering, respectively.

Tool Support

Yet another view on collaborative modeling is related to tools that support the modeling process. An example of that is “collaborative graph editing” where the focus is on real-time collaboration on the graphical representation of a model (What You See Is What I See) (Meire et al., 2003, 2007). The approach does not offer a mechanism for reducing the multitude of versions to a single model, though.

In the nineties researchers at the University of Arizona were convinced that the use of computer support would substantially improve group modeling (Dean et al., 1994b). They built a group modeling support system built on existing electronic meeting systems. They used the IDEF0 activity modeling language but the tool was essentially a collaborative text editor for model input that was later complemented by a graphical viewer on a separate (!) workstation. Manipulation of the graph itself was not possible. The approach was later extended to a graphical process language (Lee et al., 2001). The tool was found successful for large groups around 20 people but less so for the typical group size of around 10 found in business process modeling. Negotiation was not supported and
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