

COMA: A Tool for Collaborative Modeling

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Abstract. Building on earlier empirical work we have designed a prototype that supports modeling in groups. The COLlaborative Modeling Architecture tool (COMA tool) coordinates UML modeling in groups in the form of a negotiated creation process. We have employed the tool in two case studies.

1 Introduction

The nature of modeling as a collaborative process is widely accepted. Nevertheless, most of the tools that support modeling are single-user tools. This is even true for tools that explicitly address group modeling (e.g. Compendium [1]). Some notable exceptions such as [2] are out of date or do not address consensus building [3, 4]. Our objective is to support information synthesis and negotiation as two of the cornerstones of collaborative modeling [2]. The tool and the architecture are the result of a study of modeling behavior [5] and they have been tested in two case studies. Details on these cases are currently under review for publication.

2 Architecture of a Collaborative Modeling Support System

[2] identifies the cornerstones of collaborative modeling as information gathering, synthesis of information and negotiation. According to [6] the primary medium for information gathering is natural language and the organizational form is often that of a chauffeured session [7]. Tools for this already exist [1]. Information synthesis alone is also supported by a large amount of tools, namely by most conventional diagramming, modeling or CASE tools. But there is so far no current tool addressing the negotiation of models. The COMA tool provides this functionality while also allowing for information synthesis. For the latter we have made use of an existing UML modeling tool (UML Pad).

Distributed model negotiation means the coordination of the efforts of a number of modelers. The results from the empirical study suggest that such a system must provide the following functions: Propose, support, challenge and accept. A *proposal* is a suggestion for the revision of the current version of the model. It implies that the modeler posts the content of the local model editor to the group. In building the local or personal version of the model the modeler can make use of bits and pieces of existing versions (i.e. group model or other proposals), or even copy a whole version and apply changes to it.

A *support* is a positive assessment of a proposal. It can be logged by any team member after reviewing the respective proposal. It can be complemented by a comment that provides a rationale for the decision and perhaps includes suggestions for minor changes.

A *challenge* is a negative assessment of a proposal. It has to be complemented by a justification for the decision as well as constructive comments regarding improvements of the proposal.

COMA offers two rules to decide on the *acceptance* of proposals: A rule of majority and a rule of seniority. When a rule of majority is used, the team operates in an unfacilitated mode where each modeler has a vote of the same weight. Acceptance only depends on the number of supports and challenges. The rule specifies the minimum number of supports required, and the maximum number of challenges allowed for a proposal to be accepted. The required number of supports should be at least two to avoid that a modeler alone (e.g. the proponent) can make the decision. A maximum number of challenges of 0 would force a unanimous decision. When a rule of seniority is applied, the team has a facilitator that makes the decision. Other group members cannot directly influence the decision, but they can do so indirectly by making suitable comments (i.e., supports and challenges). The facilitator can and should consider the supports and challenges in the decision.

3 The COMA Tool

Although not a business modeling language, we have chosen the UML as the basis. This decision was driven by a number of factors. First, and perhaps most important, the UML is a standardized language with considerable impact in the information systems industry. Secondly, some of the diagrams, e.g. Use Case Diagrams and Activity Diagrams,

are often used for modeling business processes as companies want to leverage the benefits of a common language for both business analysis and IT design. Another reason is the ready availability of open-source modeling tools that reduce the investments in tool development.

The tool is implemented in Visual C++ 2005 on Windows based on the UML Pad by Luigi Bignami (bignamil@tiscali.it) and with the help of the wxWidgets GUI library (see <http://www.wxwidgets.org/>). A screenshot of the COMA tool is shown in Fig. 1. It represents a snapshot of a real modeling session concerning a hospital case.

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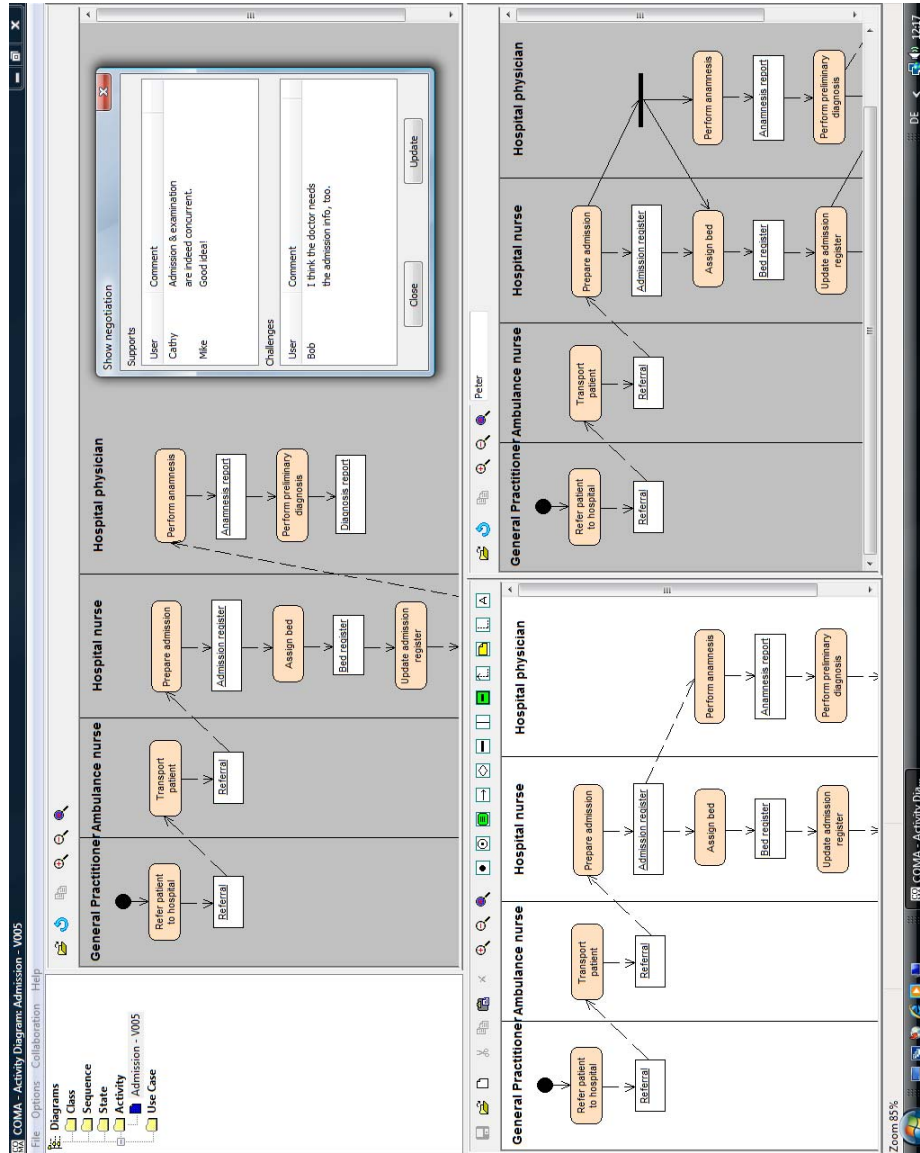


Fig. 1. Screenshot of the COMA tool