Chapter 17
Exploring Dialogue Games for Collaborative Modeling

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ABSTRACT

In our search for better understanding and support of the activities constituting collaborative modeling processes, we have developed a framework viewing them as enacted dialogue games. We have also developed and evaluated a number of experimental game-like procedures, exploring 'modeling as a game'. In this chapter, we present our generalized findings and experiences so far, discussing some key aspects underlying the analysis and design of collaborative modeling activities as dialogue games, with some emphasis on the support and guidance of novice modelers (as opposed to expert modelers).

INTRODUCTION

In the light of a rapidly increasing need for high quality "light-weight formal models"[1] (e.g. process models, formal ontologies, business rules, and so on) to fulfill the technology-based promises of information systems and AI (including the Semantic Web: Berners-Lee et al., 2001), the lack of *operational* methods for formal modeling and, as an embodiment of such methods, *tooling* to support them, is becoming a problem. The increasing need for truly *collaborative* modeling can be added to this (de Moor, 1999).

Current State of Support for Formal Modeling

Current tools for modeling are mostly editor-like, technical environments that at best offer some automated model checking, versioning, and file management. Contrary to what many seem to believe or claim, even advanced graphical editors for, for example, UML and BPMN schemas (Booch et al., 1998; OMG, 2006) still require technically skilled and above all experienced people to wield them successfully. Beyond editing, very little real support for the interactive *process* of collaborative modeling is offered, in particular if such a process is to be carried out by relatively inexpert participants ('novice modelers'). As argued at length in (Hoppenbrouwers, 2008), this is not an acceptable situation in the long run, mostly because experts (modelers, facilitators) in formal modeling are relatively few and expensive. Light-weight, collaborative formal modeling *will* have to be brought to the masses, somehow. Creating interactive, low-threshold digital environments seems to be a highly promising way of enabling this. The image of "modeling wizards" presents itself. However, such tools simply do not exist at the moment. Creating them involves both the setting and the answering of a score of research questions, and requires a long-term effort.

This chapter presents results of three years of small-scale exploratory research into the games-for-modeling approach, and offers a general insight in our current approach as well as concrete lessons learned. It does not present extensively validated general principles, but an elaborate update on a slowly maturing direction in collaborative modeling research.

Interactive Systems for Formal Modeling

Formal modeling involves a broad combination of requirements on methods (including modeling languages) and tools. The primary products of formal modeling are of course formal models, with classic requirements like correctness, completeness, and validity. However, a more nuanced picture emerges if a model's *context* (both context of use and context of creation) is taken into account (Krogstie et al., 2006; van Bommel et al., 2008): further products of modeling are *common understanding, consent, and commitment created among participants* as a result of them enacting a collaborative activity (Hoppenbrouwers et al., 2005).

Validation by showing models to stakeholders after their initial creation may work to some extent, and is in fact common practice. However, there is an essential difference between:

- Model validation and/or model merger *after* the creative process has been largely concluded
- Or, on the other hand, the creation of a model by which understanding and agreement at several levels is constructed as part of the process, *from the start*.

A similarity holds here with negotiation and collaborative decision making (Raiffa, 2002; Fisher et al., 2003). Reconciliation of positions already taken is much harder than early and continuous, collaborative construction of joint decisions based on the deeper concerns and values of the various parties involved (also see Dean et al., 1994). Indeed, as empirically confirmed by (Rittgen, 2006), the collaborative process of modeling is largely a form of negotiation, as reflected in the interaction patterns observed among collaborative modelers. In addition, blended with negotiation modeling concerns detailed and abstract *conceptualization*.

Many factors in methods and tools for modeling are subject of study in the field of Situational Method Engineering (SME or simply ME: Ralyté et al., 2007). Indeed, our approach can be seen as mainly contributing to this field. However, as argued in (Hoppenbrouwers et al., 2008), we take an approach to ME that deviates from its main-

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