

Towards a model-driven development method for collaborative modeling tools

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Collaborative modeling tools are useful and promising for many tasks within design or learning processes. However, they are difficult to build and are usually domain-specific. In response to this situation, we propose a model-driven method for the development of domain-independent collaborative modeling tools. Such a method is targeted at any user who does not have an advanced knowledge of groupware programming and needs to use a collaborative modeling tool in his/her work.

Within the area of groupware tools, in this paper we focus on distributed synchronous tools to support the construction of models. Designers work on a shared workspace, in which they create a model in a collaborative way. The collaborative modeling task can refer to a group work activity, if the problem is a real situation to be solved in the scope of a company or institution, as well as to an e-learning system, if a learning method based on collaborative problem solving is followed.

The particularity of the tools we are going to handle with respect to other modeling systems in the literature is that the design to be created is not going to be restricted to a specific domain; that is to say, the tool will be able to deal with diverse scopes of design described by means of a configuration process (Gallardo, 2007). This differs from domain-specific tools, which only allow the building of diagrams in a specific domain. An example of this kind of systems is DomoSim-TPC (Bravo, 2006), which works with the domain of Domotics. Some studies show how the use of domain-independent collaborative tools has some advantages over the use of single user tools shared by means of a shared windows system (Gallardo, 2008).

In order to make the development of such a collaborative tool easier, we are going to follow the Model-Driven Engineering (MDE) paradigm (Favre, 2004). Hence, we are going to propose a method that avoids the problems of having to re-design the tool for each new application domain. Our development method is based on three frameworks: a methodological framework, a conceptual framework and a technological framework. The methodological framework

consists of a series of phases that must be followed in order to develop a collaborative modeling tool. Those phases are (Fig. 1): (1) identification of the domain, (2) modeling of the domain and the shared workspaces, (3) production of the collaborative modeling tool that includes (3a) model transformations and (3b) generation of the tool, and (4) use of the generated tool. The conceptual framework is made up of the meta-models that are used in the meta-modeling process. Finally, the technological framework consists of a series of plug-ins for the Eclipse platform (Eclipse Modeling Framework, EMF, and Graphical Modeling Framework, GMF) that have been modified to acquire collaborative functionality and have been integrated to give support to the development method in its totality. Figure 1 shows, together with the phases of the method, a representation of the informal specification of the domain (A), an example of a domain model (B), an excerpt of a model transformation coded in the ATL transformation language (C) and a screenshot of the final tool generated (D).

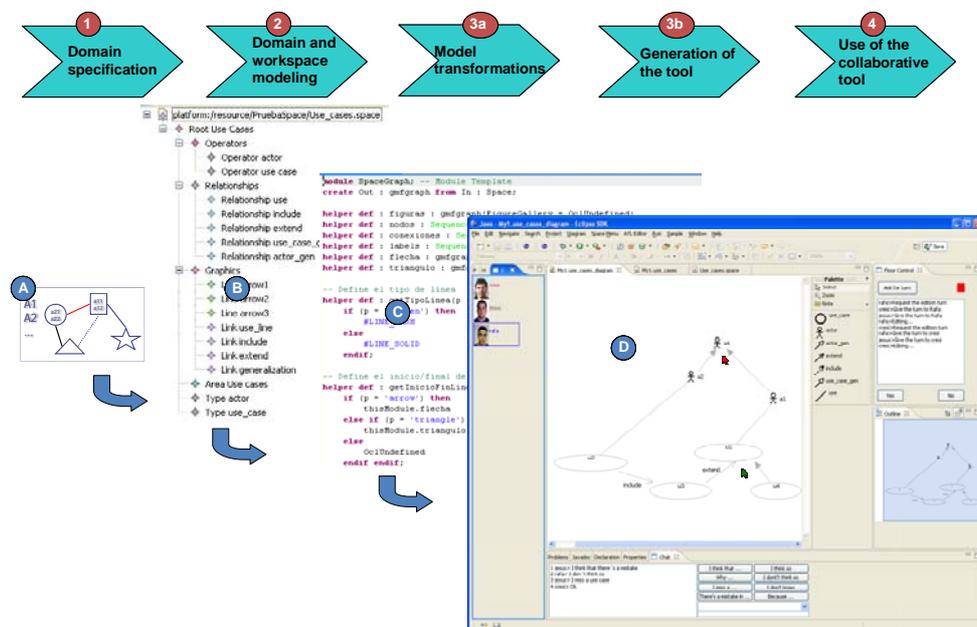


Figure 1. Application of the development method proposed

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