CSRML Tool: a Visual Studio Extension for Modeling CSCW Requirements

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Abstract. This work describes the CASE tool that provides support for CSRML (Collaborative Systems Requirements Modeling Language), an *i** extension for specifying CSCW systems requirements. The tool has been implemented as a Visual Studio 2012 extension by using the Visualization and Modeling SDK. It supports all the CSRML characteristics, such as the specification of collaborative tasks with Workspace Awareness features, as well as the management of actors, roles and groups of users involved in the system. Among other features, this tool supports also the automatic validation of the generated models, an integrated context-sensitive help system and automatic updates.

1 Introduction

A powerful CASE tool that supports modeling and validation of a Requirements Engineering (RE) language is a cornerstone for its success. That is the case of CSRML Tool (*a.k.a*. CSRMT), the tool that provides support for CSRML (Collaborative Systems Requirements Modeling Language) [2, 4], the *i**-based Goal-Oriented RE language developed to specify the special requirements of Computer Supported Cooperative Work (CSCW) systems, otherwise difficult or even impossible to model with classical RE techniques [3]. These special requirements are related to collaboration, communication and coordination (3C) tasks modeling, the actors, groups and roles management and, specially, the specification of Workspace Awareness (WA), which involves knowledge about, for example, *who* is available to collaborate, *what* are the other users doing now (or what they did in the past), *where* in the shared workspace are they working, *when* an artifact was modified or *how* a certain operation happens. Moreover, CSRML has been empirically validated by means of a family of experiments [5].

Because of all the CSCW features that CSRML is able to represent, it can be considered a graphically complex language, so that a powerful CASE tool is needed in order to guide the specification of a CSCW system by using this language. In order to lead that requirements specification, CSRML Tool was developed by implementing the CSRML metamodel with Microsoft Visualization and Modeling SDK, thus creating a Visual Studio 2012 (VS'12) extension that is presented in Section 2.

2 CSRML Tool

As previously mentioned, CSRML Tool 2012 is the CASE tool that provides support to CSRML (see Fig. 1). Currently, its development is on the stable version 2.0.130430, available at [1] along with a demo video and its documentation. This tool allows us to specify and validate a complete CSCW system by using the CSRML language, supporting the following functionalities:

- Full support for all CSRML features (e.g. WA support, 3C tasks or actors, roles and groups management)
- Specification of a complete CSCW system by means of the 5 different CSRML diagrams (GHD, SGD, RF, TRD and QFD [4]), guided by several VS'12 wizards
- Cross referencing of elements among the different system diagrams in order to preserve the model coherence (natively not supported by VMSDK and implemented by using the novel ModelBus technology)
- Diagrams validation in three different ways: design-time validation, meta-model validation and other potential sources of incoherence verification, such us recursive task and goal decompositions or duplicated references among models
- Full integration with VS'12, supporting automatic updates and communication with other Microsoft applications such as those included in Microsoft Office
- Version control of the generated models with Microsoft Team Foundation Server
- Context-sensitive help system for all the elements, relationships and diagrams, integrated with Microsoft Help Viewer 2.0. Tutorials for the most complex tasks are also included
- Expandable functionality by using Microsoft Managed Extensibility Framework

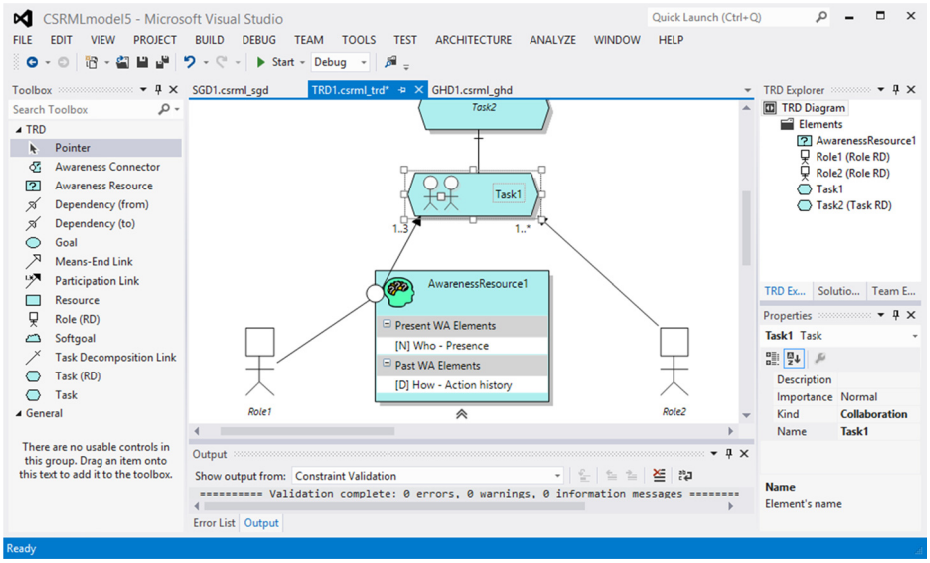

Fig. 1. CSRML Tool user interface

Additional details about the modeling elements, models editor, validation features as well as help and documentation can be found in [1]. Furthermore, it is worth noting that, because CSRML is based on *i**, this tool can also be used for specifying *i** requirements models, as it supports all its modeling elements and relationships, which are actually a subset of the CSRML ones.

3 Conclusions and Further Work

CSRML is a Goal-Oriented RE language, based on *i**, supporting the whole CSCW requirements modeling process. CSRML Tool is the software that supports the modeling of all the CSRML complex elements, relationships and diagrams. Therefore, CSRML and its supporting tool allow us to specify and validate CSCW systems, supporting 3C tasks modeling, WA specification and actors, roles and groups management.

In spite of being in a stable version, the tool is currently being modified to include the last CSRML features. In addition, usability testing has been recently performed in order to find any possible flaws regarding the tool user interface. Finally, this tool will be extended with new Model-Driven Development features in order to transform the RE specification to an analysis / design stage in a semi-automatic way.

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