Tool Support for Conflict Resolution of Models for Automated Enterprise Architecture Documentation

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Abstract. Improving the documentation of models used for Enterprise Architecture (EA) management is essential for the progress of the discipline in practice. Automated EA documentation seeks to increase data quality and efficiency of this process by collecting relevant EA data from existing information sources in the organization. While empirical evidence on the feasibility of the approach and theoretical solutions have already been proposed in research, tool support for the implementation is still an open issue since technical solutions for fundamental problems arising during the automated documentation of EA models are not available. In this paper we demonstrate a collaboration platform to support the resolution of model conflicts during automated documentation[1]. We incorporate stakeholders in the resolution of these conflicts using an implementation of a conflict resolution workflow and a novel interactive visualization.

Keywords: Enterprise Architecture, automated Enterprise Architecture documentation, collaboration, conflict resolution

1 Automated Enterprise Architecture Documentation

Enterprise Architecture (EA) models typically consist of a plethora of elements that are interconnected with each other. In current practices the documentation and maintenance of these models is performed manually to a large extent. As a result this process is perceived as very time-consuming and error-prone by the majority of the organizations in industry [6]. Automated EA documentation seeks to gather and maintain relevant EA data from existing information sources in the organization and transform this data to a respective EA meta-model. While theoretical solutions to achieve automation have been proposed in research [2] and the feasibility of this approach has been evaluated in case studies [1] as well as on an empirical basis [3], technical solutions to support automation processes and the newly arising challenges related with this approach

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[1] http://www.youtube.com/watch?v=HxbAVjsM484, last accessed on: 2013-07-15

are not available. Main contribution of this paper is a demonstration of a solution to collaboratively resolve model conflicts to achieve automated documentation.

2 Resolving Model Conflicts

The establishment of an automated EA model documentation in practice is faced with a variety of different challenges [4]. These challenges are related with the transformation of models, security concerns, economic considerations, and the collection of the EA data. In particular, complete automation of model transformations are not possible due to data (e.g. from source systems like Network Scanners and Monitors [3]) that is often too fine-grained for mere EA purposes and missing model coverage. Appropriate tool support for automated model documentation needs to address these issues appropriately to achieve this long-term goal. In previous work, we presented a collaborative workflow to resolve these model conflicts by involving stakeholders [7]. The workflow uses conflict resolutions tasks that are escalated to different stakeholders in the organization. These conflict resolution tasks consist of interactive visualizations that can also be used by business users not having a technical background.

2.1 Demonstration

The EA model can be accessed and manipulated using a web application in the demo system. Every element is represented with structured information on wiki pages. We exemplify the system using ArchiMate as EA modeling language, although an arbitrary information model can be used with the presented solution.
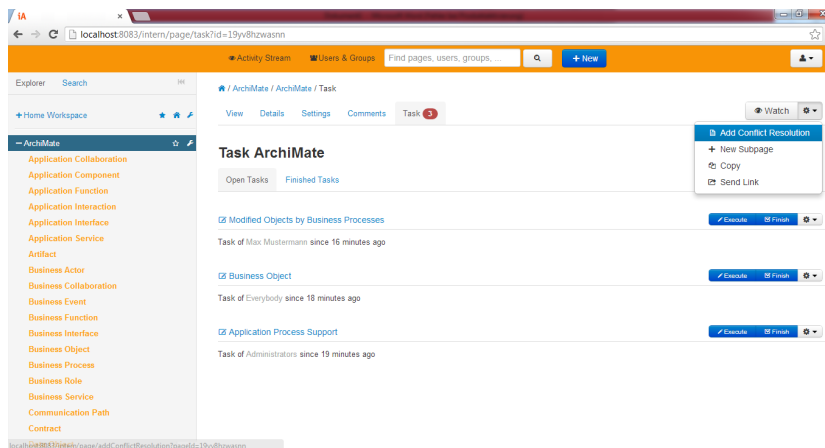

Fig. 1. Overview of initial conflicts and the creation of a conflict resolution task

Fig. 1 shows a screenshot containing the initial set of open conflicts and the action for the creation of new conflict resolution tasks. These tasks are related

with a particular stakeholder (e.g. EA Coordinator, EA Repository Manager, Data Owner, or EA Stakeholder) and the concerning element(s) in the EA model. In case an EA Repository Manager is not able to resolve a conflict on his own, he can create and configure a conflict resolution task. The configuration (cf. Fig. 2) of a new conflict resolution task contains information on the conflict model elements (*Application Component* and *Node Device*) as well as the mapping model element (*Infrastructure Interface*). In addition, the responsible Data Owner(s) of the information source that was used to gather the data can be selected to resolve this conflict. The information description shown at the bottom of the window allows the creator of the task to provide some additional information.
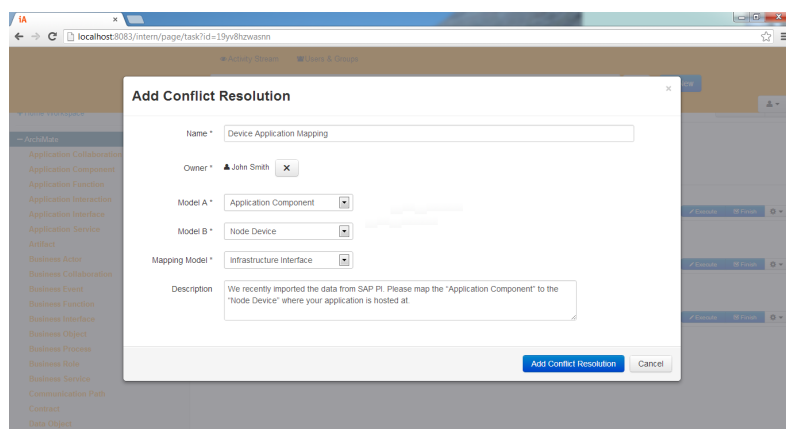

Fig. 2. Configuration of a newly created conflict resolution task in the system

After this task is submitted in the system, the selected Data Owner receives a new task containing the respective interactive visualization that is shown in Fig. 3 in his worklist. The Infrastructure Interface *SAP RD Hosting* is shown in the middle of the screenshot. Users can drag elements from the Application Component and the Node Device and drop these elements in the Infrastructure Interface to create a new relationship that could not be established during the model transformation automatically. The dropping of elements is supported with an additional coloring on valid target positions in the Infrastructure Interface. Changes in the visualizations are directly persisted in the EA model as soon as the Data Owner submits this task. In case the Data Owner is not able to resolve this tasks, he can forward it to an EA Stakeholders in the organization. Especially for EA Stakeholders not having a technical background, the given interactive visualization should simplify the conflict resolution. Resolved conflicts within major releases are automatically forwarded to an EA Coordinator for approval purposes. This approval uses the same interactive visualization and it provides an additional quality assurance step in the system.
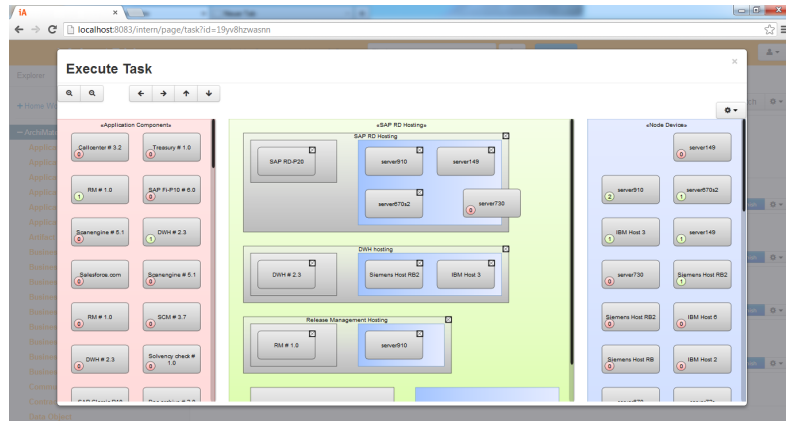
Fig. 3. Interactive visualization for the resolution of an incomplete data import

2.2 Implementation

As illustrated in Figure 4, we utilized an Enterprise 2.0 framework [5] and a framework for interactive EA visualizations [8] to realize an EA repository, which allows us to import data from arbitrary information sources to our EA repository. Conflict tasks can be created by end-users in the EA repository. A conflict task
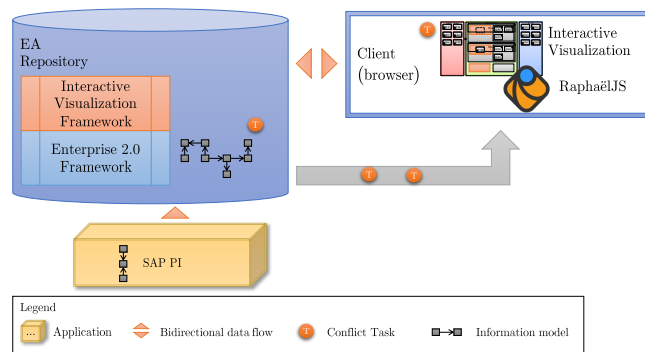

Fig. 4. High-level deployment architecture of the demonstration system

employs the interactive visualization framework on execution, i.e. the interactive visualization for the conflict resolution is generated in a model-driven manner. On execution, the interactive visualization is sent to the browser. The actual rendering within the browser is accomplished using the RaphaëlJS[2] framework to

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[2] `http://raphaeljs.com/`, last accessed on: 2013-07-15

provide cross-browser support. Changes to a conflict visualization are propagated to the EA repository such that underlying data is manipulated.

3 Conclusion

This paper has demonstrated a collaboration platform to resolve arising conflicts during the automated documentation of EA models. This solution uses a collaborative workflow that has been developed and evaluated in previous work. The presented system is the first step towards tool support for automation in this domain and it facilitates the incorporation of stakeholders. Over the next years, we will evaluate the system in practical settings to promote the development of collaborative tools for EA management and automated model documentation in particular.

Acknowledgment

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