Chapter 13
Human Factors in Automated Analysis for Enterprise Models

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ABSTRACT

Enterprise models are created for communicating and documenting the current state of the enterprise. However, these models can also be used for supporting analysis processes and are fundamental assets in project management. But, analysis is a process made by humans, and due to enterprise models that are complex and have a large amount of elements, analysis is usually a tough process. Then modeling tools might provide support for analysis. It is possible to offer this support through the use of automated analysis methods, which are algorithms for providing specific calculations based on the elements included in the model. The results of said automated analysis methods support decision-making processes. It is also possible to execute a sequence of analysis methods by the configuration of analysis chains. This chapter presents a proposal and strategy for analyzing enterprise models by the execution of automated analysis methods and automated analysis chains. This strategy is presented using enterprise models that conform to ArchiMate as modeling language.

INTRODUCTION

Information Technologies (IT) have become very important assets in enterprises for managing their business information, which is used by humans to achieve their business goals. IT components are modeled through enterprise models that might serve for different objectives such as analysis, communication, and documentation. When one enterprise model is used by humans to perform analysis processes in the organization, analysis results are the main input taken by humans to support decision making processes. Consequently, analysis processes have become a very important task and enterprise models must be able to include required information for performing desired analysis. Analysis is a complex human activity because it demands formulating hypotheses and finding solid insights to discover certain assessments of the enterprise (Florez, Sanchez, & Villalobos, 2016). Typically, one human with the role of analyst...
has the proper knowledge to manipulate these models in order to extract valuable information, which would be useful for evaluating the current state of the organization. Such information might be used in order to support decision making processes (Buckl, Matthes, & Schweda, 2009). Normally, quality of analysis results depends on factors such as: 1) knowledge, skills, and experience of the analyst; 2) quality of models; and 3) granularity, completeness and level of detail of the information contained in models (Florez, Sanchez, & Villalobos, 2014a). The implementation of automated analysis methods allows performing analyses by automating the operations for obtaining and calculating information. Based on these methods, it would be possible to use properly the model with all its elements and relations.

Moreover, some analyses can require different kinds of results that can be obtained by performing several different analysis methods. In this way, some analysis methods can have as inputs some information provided by other analysis methods. Then, analysts should be able to configure analysis chains composed by automated analysis methods in order to obtain a greater amount of results in the analysis process.

Nowadays, there are several tools that allow creating enterprise models. However, because of the size and complexity of the models, modeling tools do not present the complete model because it would not be properly visualized, but they present the model by partial views, which display the model with a reduced number of elements facilitating its manipulation by the analyst. Despite modeling using views is an excellent strategy for deploying enterprise models, this feature makes harder the analysis process for humans because required elements for one specific analysis can be scattered in more than one view. Therefore, it is useful for analysts performing automated business analysis methods that are algorithms, which based on the model, provide new business information that can be provided as facts or included in the model enriching it. Thus, business analysis methods support human analysis processes by providing knowledge regarding the enterprise. In addition, one model should be used for satisfying different analysis requirements by performing several analysis methods that can be executed individually or through the configuration of analysis chains.

However, not always the analyst can make business analyzes because of the lack of specific required information in models. Thus, automated business analysis methods require that the enterprise model to be analyzed have specific information in the elements or relations involved in the analysis method that is intended to be executed by the analyst. Then, it is desirable to extend the metamodel of the modeling language used for creating the enterprise models in order to ensure that the model includes proper and necessary information. This chapter presents a proposal for supporting automated analysis methods and analysis chains. This proposal has been created using ArchiMate as modeling language as well as includes a strategy for creating models based on supporting analysis requirements by extending the ArchiMate metamodel. Furthermore, the chapter presents a modeling tool, which is a model-based approach for creating, validating, and analyzing ArchiMate enterprise models.

This chapter has the following structure. The section Background describes concepts related to enterprise modeling and presents the related work. The section Enterprise Analysis discusses enterprise architecture analysis, which includes the description of analysis methods, strategy for creating and analyzing enterprise models, and analysis chains. Then, the section Analysis Tool presents a tool for the implementation of the strategy. Finally, the section Conclusions concludes the chapter.