Second International Workshop on Meta-Models and Schemas for Reverse Engineering ateM 2004

— Integrating Reverse Engineering and Model Driven Engineering —

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Abstract

The International Workshops on Meta-Models and Schemas for Reverse Engineering *aim at utilizing meta-technology for the development and use of reverse engineering toolsets. The focus of ateM 2004 is the integration of meta-technology of model driven engineering into reverse engineering.*

1. Model Driven Engineering

Model Driven Engineering (MDE) approaches are becoming increasingly popular in industry. The *Model Driven Architecture (MDA)* [7] standard from the OMG is a specific incarnation of MDE concepts. By contrast, MDE itself is an open and integrative approach that embraces many other *Technological Spaces* [3] in a uniform way. The emphasis of MDE is on *bridges between Technological Spaces* and on *reuse and integration* of various bodies of knowledge developed by different research communities. Examples of technological spaces include Grammarware, with BNF as a possible representative, Documentware and XML, Dataware and SQL, Modelware and UML, etc.

In each technological space, the concepts of *model*, *metamodel* and *transformation* have a different incarnation. For instance, the distinction "model" and "metamodel", which leads to the M_1 and M_2 levels in the metamodeling pyramid, also exist in other technological spaces (cf. table 1).

Metamodels, Schemas, Grammars, Viewpoints all coexist at the M_2 level. Since there is no such thing such as the *Best Technological Space* [3], the idea behind the MDE is to be able transport a problem from space to space, depending on the problem at hand. *Transformations at various levels* of abstraction and across multiple technological spaces are the basis of the MDE approach.

technological space	model	metamodel
Grammarware	program	grammar
Documentware	fact/instance	schema
Dataware	document	schema
Software Architecture	view	viewpoint
Graphware	graph	graphclass

Table 1. meta-levels in technological spaces

2. Model Driven Engineering in Reverse Engineering

Although Model Driven Engineering may be a candidate for the next paradigm in software engineering, it is unlikely to succeed if Reverse Engineering issues are neglected. Reverse Engineering is fundamental to support the continuous evolution of existing software products and MDE concepts have to integrate smoothly with legacy software.

Although the importance of metamodels, schemas, and grammars has been known for long in the Reverse Engineering community, as yet their study have not been put under a common umbrella. Models are sets of "facts" about software systems. Models are stored in reverse engineering repositories according reference schemas like DATRIX [5] or DMM [6]. Schemas define structures used by reverse engineering tools and constitute the basis for defining the semantics underlying various analysis techniques (cf. [4]). Explicitly defined metamodels, schemas, and grammars further allow reverse engineering tools to be adaptable and interoperable. Thus, the standard exchange format for reverse engineering tools, GXL [8] provides meta-model based adaptivity for specifying and using various reverse engineering schemas.

technological space	transformation language
Grammarware	TXL, ASF+SDF
Documentware	XSLT or XQuery
Dataware	SQL
Modelware	ATL, UMLX and QVT
Graphware	Grok, Progres, AGG

Table 2. transformation languages in technological spaces

Making M_2-level artifacts explicit also allows the use of transformation languages suited to the representation selected. Table 2 shows some transformation languages used in various technological spaces.

Integrating Reverse Engineering and Model Driven Engineering is very promising, but this raises many research issues. In particular transformation techniques from MDE might be applied in various Reverse- and Reengineering tasks. These techniques will provide significant aid to use data on software systems on different levels of abstraction in an integrated manner. This integration also arouse great interest in industry. Various metamodels have been already standardized to support legacy software (e.g., the COBOL or C metamodel in the CWM standard). Similarly the OMG has also launched a new working group on Architecture Driven Modernization (ADM), which aims at the integration of Reverse Engineering and MDA.

3. Topics of Interest

ateM 2004 succeeds the ateM 2003 workshop on *Meta-Models and Schemas for Reverse Engineering* [1, 2]. While ateM 2003 was oriented towards an inventory of meta-technology in Reverse Engineering, ateM 2004 focuses on use and integration of meta-technology of model driven engineering into reverse engineering.

Thus, ateM2004 is intended for people interested in applying MDE-techniques in reverse engineering and for people interested in bringing reverse engineering issues to the field of model driven engineering. Topics of interest include:

- Relationships between meta-models, schemas, grammars, viewpoints and ontologies
- Methods and techniques to define, reuse, integrate and transform meta-models, schemas and grammars
- Model Driven Engineering, Model Driven Architecture and Architecture Driven Migration
- Meta-models for software evolution, transformation, migration and architecture reconstruction
- Relationships between technological spaces and transformation languages
- Metaware technologies and standards such as ADM, XMI, MOF, GXL, JMI, EMF, MDR, QVT, etc.
- Meta-environments, Meta-CASE and meta-tools for reverse engineering
- Reverse engineering of grammars, metamodels, schemas or viewpoints.

This workshop is intended to discuss meta-technologies and reverse engineering, to appraise their progress and to explore future directions. The goals of the workshop are:

- to study the intersection of reverse engineering and model driven engineering
- to exchange experience about meta-models, schemas, grammars and associated techniques when used in the context of reverse engineering
- to discover areas of mutual collaboration; and
- to envision future trends in the field of metamodel driven reverse engineering
- to establish a research strategy other research effort

4. Conclusion

The purpose of this workshop is to bring researchers from different communities to study the use of meta technologies in the context of reverse engineering. This years theme of the workshop will be the integration of Reverse Engineering and Model Driven Engineering.

References

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