Quality management using model-driven engineering: an overview.

I. Ruiz-Rube and M.J. Escalona

Abstract Quality Management (QM) is one of the critical points of any software development process. In recent years, several proposals have emerged on this issue, mainly with regard to maturity models, quality standards and best practices collections. Besides, Model Driven Engineering (MDE) aims to build software systems through the construction and transformation of models. However, MDE might be used for other different tasks. In this poster, we summarize the main contributions about the application of MDE to QM activities. The reviewed papers are classified according to a set of practices known relating to assuring, reviewing, monitoring and improving of the software process. We believe that the application of MDE to QM is an area to maximize, because although there are numerous references regarding to MDE and QM, the volume of studies about joint applications is low.

Acknowledgements This research has been supported by the project QSimTest (TIN2007-67843-C06-03) and by the Tempros project of the Ministry of Education and Science (TIN2010-20057-C03-02), Spain.

I. Ruiz-Rube
University of Cádiz, C/ Chile n1, 11003, Cádiz (Spain), e-mail: ivan.ruiz@uca.es

M.J. Escalona
University of Seville, Av. Reina Mercedes S/N, 41012, Seville (Spain) e-mail: mjescalona@us.es
Quality management using model-driven engineering: an overview.
Iván Ruiz-Rube¹, Francisco José Domínguez-Mayo² and Maria José Escalona².
¹University of Cádiz, C/Chile nº1, 11003, Cádiz (Spain), e-mail: ivan.ruiz@uca.es
²University of Seville, Ave. Reina Mercedes S/N, 41012, Seville (Spain) e-mail: fjdominguez,mjescalona@us.es

Technical Reviews
MDE is presented as a great opportunity to improve the quickness and effectiveness of technical reviews. Using several techniques, you can check the quality and adequacy of the models regarding to the proper metamodels and verify compliance of certain organization standards in your designs.

Guidelines Rules: OCL queries

Model checking & Anti-patterns recognition

Requirements Management and Validation
Developing the requirements as models, typical practices are improved such as monitoring traceability to identify consistencies between requirements, plans and work products, and validating user requirements through automatically generated navigable prototypes.

Requirements Validation

Requirements Metamodel

Analysis Metamodel

Design Metamodel

Traceability Assurance

Quality Improvement
The use of models will help to improve the quality of our designs by automatically applying modeling patterns and software refactoring techniques.

Measurement and Analysis
The measurement and subsequent data analysis, it’s very important for continuous improvement of organizations, because they can detect areas for improvement. MDE can enhance the definition and compilation of indicators, using models for measuring and data warehouses.

Quality Framework

WE Software Measurement Meta-Model

Simulation
Simulation in software engineering is a practice that has received significant attention in the academic field, although not in the industry. One of the most important problems in the software simulation is the definition of simulation models themselves. MDE can solve this issue, by the transformation of engineering models in simulation models.

Transformation Testing

PIM
- PTM

PSM
- PSTM

Code
- Testing Code

References:

Acknowledgements: This research has been supported by the project QSimTest (TIN2007-67843-C06-03) and by the Tempos project of the Ministry of Education and Science (TIN2010-20057-C03-02), Spain.