

eGuidelines – A Tool for Managing Modeling Guidelines

Different types of guidelines are applied in nearly every organization that employs model-based design. Guidelines are not only used during the modeling phase but also during implementation. Examples of such guidelines are

- ⌘ modeling style guides /MAAB01, JMAAB03/,
- ⌘ 'safe' modeling language subsets,
- ⌘ design for testability guidelines,
- ⌘ model review guidelines /CDF+05/,
- ⌘ autocode intent guidelines /Dav05/,
- ⌘ guidelines for the generated code,
- ⌘ 'safe' implementation language subsets /MISRA04/,
- ⌘ autocode review guidelines.

Based on the experience of the authors, the division of guidelines into rules, which have to be respected during the different development activities, and patterns, for modeling or coding of typical, recurring fragments, has proved successful.

Project work has repeatedly shown that the observance of such rules and the use of standardized patterns for the successful realization of requirements in executable models is indispensable. If, in addition, the model is meant to serve as a basis for production code, further guidelines must be observed as early as possible in order to allow efficient autocode to be generated with a low amount of effort.

Besides assuring efficient, consistent and functionally reliable modeling / implementation, the modeling guidelines' main purpose is to increase comprehensibility (readability), maintainability, reusability and testability. For user acceptance, it is essential that the motivation for applying each individual guideline is provided, i.e. the usefulness of, for example, higher portability as well as side effects to be taken into account (for example with regard to resource consumption) is clarified. Examples make access to the guidelines as well as adequate realization easier in the respective project.

Aside from universally-valid modeling guideline sets, such as the MAAB style guides, company- and project-specific guidelines are constantly appearing. These may result from project-specific naming conventions, the varying availability of ECU resources, or the use of special downstream development tools. Consequently, project-specific guidelines are defined for individual projects. These guidelines are based on the general guidelines but take the special conditions of the respective project into account in particular aspects.

Furthermore, guidelines are not static documents; instead they undergo regular modifications and have to be adapted to the progressing tool versions. In particular, taking new means of description in Simulink / Stateflow into consideration and adaptation to new, improved code generator versions requires substantial maintenance effort.

The efficient management and provision of universal as well as company- and project specific guideline collections requires specific tool support. Therefore, the authors have developed eGuidelines, a web-based infrastructure for the publication of guidelines and their centralized administration (Fig. 1).

The eGuidelines allow the joint administration and consistent updating of different sets of guidelines as well as the project-specific variants which are based on them. Moreover, different filters and views of the guidelines available can be created.

During the different model-based development activities, the eGuidelines support the user to access and search through the relevant sets of guidelines according to different criteria. The web-based provision of guideline sets allows cost-efficient maintenance and updating in intranet environments. The user is provided with a single place to go when accessing the latest version of a guideline set, the circulation of outdated versions can be avoided. Within the eGuidelines database, each guideline is treated individually, in order to avoid duplicates, if a rule or a pattern is part of more than one guideline set.

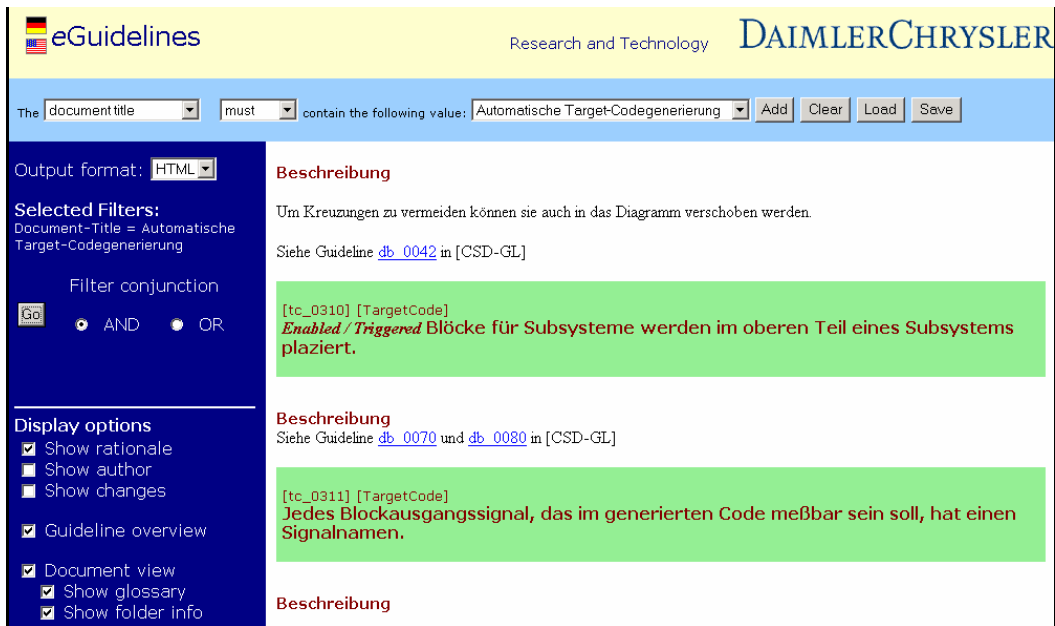


Fig.1: Screenshot of the eGuidelines tool

Experience in piloting the eGuidelines has shown that developers continue to expect a printed version parallel to the guidelines in electronic form. Consequently, when creating the eGuidelines we made sure that an easily legible paper version (hard copy) could be generated from it whilst observing the single-source principle.

At present, DaimlerChrysler Research and Technology is processing the different company-internal guideline sets and plans to make them available within the eGuideline infrastructure. A demo version of the eGuidelines can be found at:

www.immos-project.de > Tools > eGuidelines

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