



## METRINO

### Contact

Dr. Tom Ritter

Director

System Quality Center – SQC

Phone +49 30 3463-7278

tom.ritter@fokus.fraunhofer.de

Fraunhofer FOKUS

Kaiserin-Augusta-Allee 31

10589 Berlin

Germany

[www.fokus.fraunhofer.de/en/sqc](http://www.fokus.fraunhofer.de/en/sqc)

[www.modelbus.org](http://www.modelbus.org)

It is impossible to imagine our lives without software-based systems, which are becoming more and more complex as they have to fulfill ever rising demands on functionality, availability, stability and security. To comply with these high quality demands the assessment of quality is vital right at the start of a software development process. Only early and continuous evaluation helps to locate structural problems and enhance the quality.

In a model-driven development process models are the primary artifacts and their quality has a significant influence on the quality of the final software-based system. Due to the central relevance of the models, the quality requirements for them increase. While numerous quality characteristics for code artifacts have been identified and standardized in various quality models in the recent years, the definition of appropriate quality criteria for models is still not well established. One important challenge therefore is to identify properties and quality of the models and to find an appropriate mechanism to define the metrics for complex models.

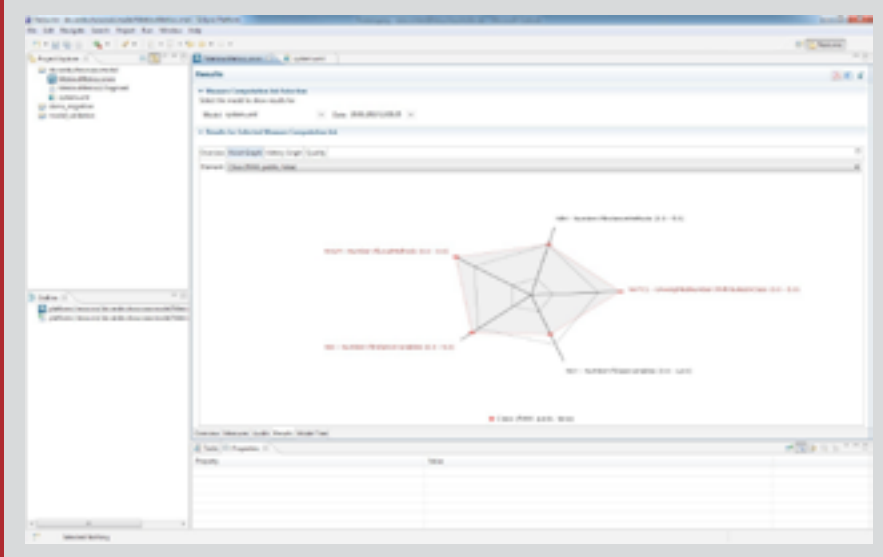
---

### Model-Driven Quality Management

---

Metrino is a tool to support the validation and quality assurance of models and can be used as an independently or in combination with ModelBus® service. It is able to manage and generate the metrics for domain specific models and allows you to automatically derive metrics from a meta model based on an extensible set of rules or to define custom metrics for it. The metrics can be applied to any model, which conforms to the metamodel they have been generated for.

*Visualization of metric computation results in kiviati diagram*



Metrino analyzes and verifies the attributes of the artifacts including complexity, size and description. Furthermore the tool offers different capabilities to present and visualize the metric's computational results, e.g. in tabular way and kiviati diagram. These results can be analyzed over time, since the tool stores results of multiple evaluations. The overall goal of Metrino is to improve each individual artifact as well as the complete system information and to assure the quality of the final software-based system.

### From Requirements to Test Cases

Metrino supports the engineer throughout the whole development process and is applicable to various artifacts. It is based on the Object Management Group's (OMG) Structured Metrics Meta-Model (SMM) and can be used for models of the Unified Modeling Language (UML) as well as for any Domain Specific Modeling Language (DSL). This comprises in particular tool specific languages and dialects. Every modeling artifact in a development process can be analyzed. A corresponding result presentation is available on demand or as a generated report.

The metrics can be either generated based on a customizable rule set or collected and organized manually. The tool front-end not only allows the definition and management of metrics, but also the definition of thresholds and grouping of metrics for adopting it to the specifics of the system under development. The metric set and the results can be exported and imported using a standardized model format, which allows the integration with other analysis tools.

### Application and Benefits

Metrino is applicable in various domains including embedded systems design, IT-Business and automotive for example. Based on the Structured Metrics Meta-Model (SMM) Metrino offers functionality to manage metrics and to apply them on modeling artifacts as well as on the complete development chain, including traceability and coverage analysis. It provides several facilities for the graphical processing of metric evaluation results and even its comparison over history. Metrino offers a fast start for metric creation for unknown modeling languages and a grouping and management mechanism for metric sets. The Eclipse-based front-end fits perfectly into existing tool chains and it can be used in background mode as a ModelBus® Service for automatic computing of metrics and generating results reports. Metrino can be employed in all process steps and can be applied to all models stored in ModelBus®.

### Features

- Generation and management of model metrics
- Automatic derivation of metrics from a meta model
- UML and DSL
- Managing metric sets for your project context
- Visualization of metrics' computational results, e.g. in tabular way and kiviati diagram
- Result analyzing and comparison over history

### Standard Metrics Examples

- Basic number of classes per package
- Inheritance tree
- Specific requirements coverage
- Complexity of subsystems

