PATAS - Quality Assurance in Model-Driven Software Engineering for Spacecraft

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Within PATAS (Product Assurance with TASTE Study), a product quality model with software and model metrics had been developed and implemented in an end-to-end model-driven software engineering (MDSE) lifecycle demonstrator, based on TASTE.

In this talk, we will present the condensed results of the study. This includes an applicable quality model with correlated model metrics for MDSE, the elaboration of the demonstrator implementation and qualitative as well as quantitative results of the use-case implementation.

The goal of this study was to find applicable concepts to maintain quality and dependability levels, when MDSE is applied. This requires the definition of connected model and software quality indicators. These indicators are identified and integrated with ESA's reference software product quality model (ECSS-Q-HB-80-04A). Figure 1 displays the new quality model, which had been integrated in a model-based software development lifecycle demonstrator, based on TASTE. To evaluate this demonstrator and the integrated quality indicators, mission-critical parts of the command and data handling subsystem of a satellite mission had been modelled and subsequently coded, simulating a realistic development scenario as use case. The aim of the activity was to demonstrate the effect of the end-to-end lifecycle in combination with the developed quality model on the final onboard software product. The final results shall set the baseline for recommendations to improve Quality Assurance in MDSE at ESA.

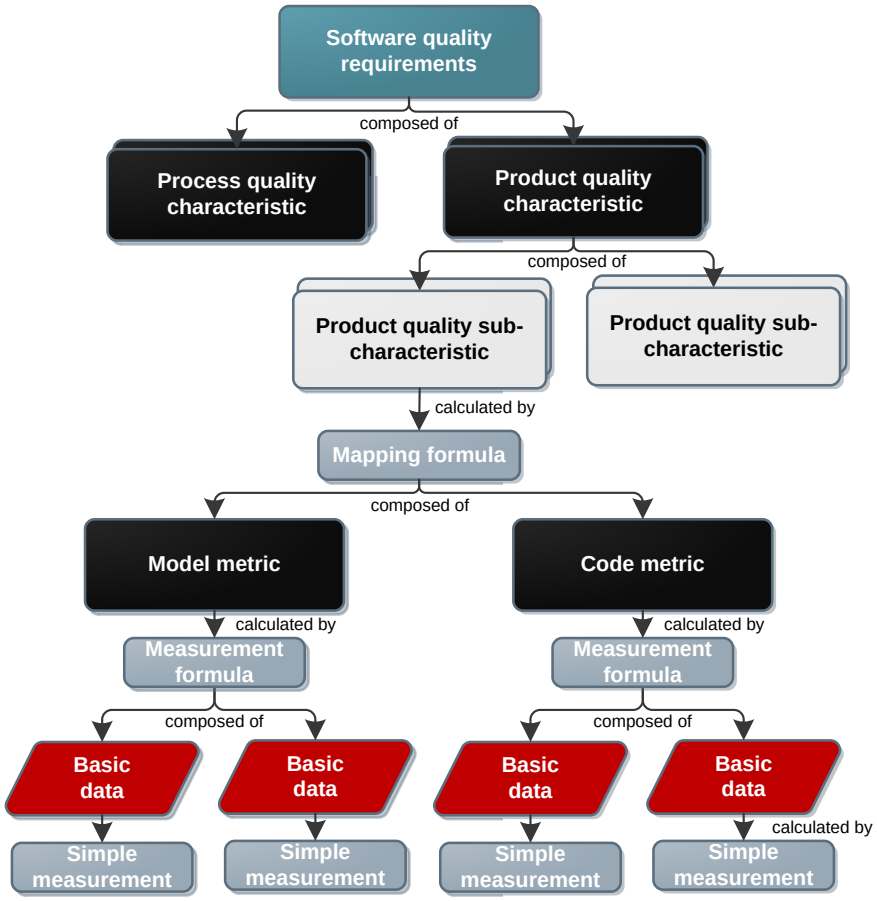

Figure 1 PATAS Quality Model