UML model refactoring: a systematic literature review

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Abstract Model-driven engineering, an emerging trend in software engineering, has enabled the use of refactoring to UML models. Numerous approaches to model refactoring, problem detection, consistency management, and tool support to automate and verify refactoring are discussed and distributed across numerous research literatures. This paper provides a systematic overview of existing research in the field of model refactoring. A total of 3,295 articles, related to the field of UML model refactoring, were extracted from well-known electronic databases. A multi-stage selection process was used to ensure proper inclusion of relevant studies for review and analysis. Ninety-four primary studies were eventually selected and analyzed based on a number of different criteria: UML models considered for refactoring, formalisms used to support refactoring at the model level, important to consider when building refactoring tool support, and the effect of refactoring on model quality. The results of this review indicate that UML model refactoring is a highly active area of research. Quite a few quality techniques and approaches have been proposed in this area, but it still has some important open issues and limitations to be addressed in future work.

Keywords Model refactoring · Model transformation · Systematic literature review · UML

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