

Maintaining Consistency across Engineering Artifacts

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Abstract: We summarize the paper Maintaining Consistency across Engineering Artifacts, published at IEEE Computer 51(2), pp. 28-35, 2018. Detecting inconsistencies across multi-domain and multi-tool artifacts is an important and critical task. Inconsistencies may lead to project failures, cost, and schedule overrun - especially when identified incorrectly or late. The paper we summarize explores a technology for consistency checking that is able to automatically and continuously detect inconsistencies - both among knowledge within and across engineering tools.

Keywords: Model-Driven Engineering; Consistency Checking; Cloud Engineering

1 Heading

Software and systems engineering has become a complex and multidisciplinary process. Engineers capture engineering knowledge within their tools – artifacts such as requirements, hardware components, computations, and use cases. Although these artifacts are syntactically and semantically diverse, they are nonetheless interdependent. Hence, artifact inconsistencies may happen not only within individual engineering tools (intratool inconsistency) but also across multiple tools (intertool inconsistency) [Eg11]. The paper presents the Model/Analyzer approach, an automated intratool consistency checker. Its most important capability is providing inconsistency feedback instantly when engineers change artifacts [Eg11]. Engineers thus use the Model/Analyzer to understand the impact of any changes they are making immediately and, if they choose to do so, fix inconsistencies right away. The DesignSpace cloud [De15] provides a common representation and allows its artifacts to be linked. By integrating the Model/Analyzer with the DesignSpace cloud, we demonstrate multi-tool, multi-engineer consistency checking. Tool adapters synchronize the artifacts from tools to the common representation via transformation steps. Within the cloud, the Model/Analyzer then finds all elements needed for consistency checking and communicates the inconsistencies back to the engineers.

References

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