Open Source Innovation platforms for MBSE?

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Abstract. The full potential of model-based systems engineering tools can only be realized by providing not only methods to build models for documentation or code generation, but also powerful methods of analysis and synthesis. This requires expertise from different fields that range from meta-modeling via tool architecture issues to semantic theories and hardware platforms.
Currently, closed -source commercial approaches to model-based engineering specifically in the field of embedded systems have made substantial achievements, but can present an impediment to innovations by strict IP protection. As a result, open-source initiatives have achieved increased attention by both industrial and public bodies. An open-source based approach, on the one hand, provides the possibility to combine a large variety of different techniques and methods by providing an integration platform (like a joint meta-model for many different participants), while on the other hand it also requires compromises w.r.t. to clarity of concepts, like the choise of a model of computation. Both approaches have their advantages and disadvantages. In this presentation, we show two approaches from either extreme: AF3 a free license model-based engineering tool ranging from requirements engineering to schedule generation based on a clearly defined semantics; and mbeddr an open-source model-based engineering tool focusing on adding language-extensions to programing languages based on the C-language semantics. Besides illustrating these approaches, we discuss the advantages and disadvantages of either eco-system, and their effect on realizing and disseminating innovations.