A preview of the next generation of the systems modeling language (SysML 2.0)

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Abstract. The Systems Modeling Language (SysML) is today by far the most popular modeling language for model-based systems engineering. It has been initially introduced as an open standard of the OMG (object management group) in 2007. SysML is pretty much the lingua franca as far as MBSE is concerned in international contexts, and it is in extensive use across the US A&D industry and also in Europe, India and China. SysML is also mandated by the US DoD as means of SE collaboration. In addition, it is largely practiced across the Automotive industry, for example across the German OEMS and 1st tier suppliers. The first generation of SysML (now in revision 1.6) was based on OMG's unified modeling language (UML), and technically created as a UML profile. After 10 years of industrial usage, a new RFP for version 2.0 was published in December 2017. A large submission team has been formed to create the V2.0 specification during 2018 known as the "SST" (SysML submission team), with participants from many of the US and European A&D primes, vendors, academics, among which is also the author of this abstract. SysML v2.0 is expected to be published by middle of 2021. SysML V2 incorporates many lessons learned from the application of its predecessor: it is no longer based on UML but is an independent specification, based on systems modeling foundations. The requirements were to naturally represent multi-disciplinary systems, where interfaces can be electrical or mechanical, in addition to software. Properties can represent physical quantities and relationships across. System functions and components can be introduced without necessarily specifying types before usage like in V1, which was inherited from the UML OO nature. In addition, along with the language development there is a corresponding track to develop an implementation prototype, which allows practitioners to conduct verification use cases against a concrete language environment. In this presentation we will present the key aspects of the V2.0 language using a concrete system model which is also used as the primary reference model by the specification team. We will present new capabilities such as system hierarchy and interfaces, functionality and allocation, system variability, analysis cases and trade studies, queries and view specifications. We will also discuss new practical capabilities such as the model OSLC API and integration with other lifecycle tools.

Biography

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Eran Gery is a World Wide lead for IBM Product Engineering Solutions. Eran leads the engineering practices and solution architectures applying IBM ELM to industrial domains, mostly Aerospace and Defense, Automotive, and Medical Devices. Eran's expertise includes Systems and Software Engineering practices, Engineering Lifecycle Management, Model Based Engineering, and Product Line Engineering.
Eran has over 25 years of experience within the complex systems domain. Eran was also the the principal architect of the Rhapsody MBSE product at IBM, after 5 years as an embedded systems developer in a defense company. Eran is also an active member of the SysML V2 specification teams in the OMG.