

## Enhancing Model Interoperability and Reuse by Designing and Developing a Unified Metamodel Standard

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**Abstract :** Mankind has always used models to solve problems. Essentially, models are simplified versions of reality, whose need stems from having to deal with complexity; many processes or phenomena are too complex to be described completely. Thus a fundamental model requirement is that it contains the characteristic features that are essential in the context of the problem to be solved or described. Models are used in virtually every scientific domain to deal with various problems. During the recent decades, the number of models has increased exponentially. Publication of models as part of original research has traditionally been in in scientific periodicals, series, monographs, agency reports, national journals and laboratory reports. This makes it difficult for interested groups and communities to stay informed about the state-of-the-art. During the modeling process, many important decisions are made which impact the final form of the model. Without a record of these considerations, the final model remains ill-defined and open to varying interpretations. Unfortunately, the details of these considerations are often lost or in case there is any existing information about a model, it is likely to be written intuitively in different layouts and in different degrees of detail. In order to overcome these issues, different domains have attempted to implement their own approaches to preserve their models' information in forms of model documentation. The most frequently cited model documentation approaches show that they are domain specific, not to applicable to the existing models and evolutionary flexibility and intrinsic corrections and improvements are not possible with the current approaches. These issues are all because of a lack of unified standards for model documentation. As a way forward, this research will propose a new standard for capturing and managing models' information in a unified way so that interoperability and reusability of models become possible. This standard will also be evolutionary, meaning members of modeling realm could contribute to its ongoing developments and improvements. In this paper, the current 3 of the most common metamodels are reviewed and according to pros and cons of each, a new metamodel is proposed.

**Keywords :** metamodel, modeling, interoperability, reuse

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