

Towards an Investigation of the Conceptual Landscape of Enterprise Architecture^{*}

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Abstract. In this paper we discuss the preliminary phase of our investigation into the conceptual landscape of Enterprise Architecture (EA). EA involves the creation of a holistic enterprise model which requires the integration of models describing many aspects and concerns. These models are often created by different communities in different modeling notations (e.g. i*, BPMN, e3Value, UML). Our goal is to aid in the validity of such integrated models by ensuring the semantics originating from the individual notations are well understood and not just superficially handled. Having a more fine-grained understanding of the semantics of these individual notations and how they are used by their respective modelers helps ensure that the enterprise model is a valid reflection of all the separate aspects. In order to do so it is necessary to explicate the semantic differences between the constructs of these notations as well as between communities using the same constructs differently. To accomplish this we selected a number of modeling notations and related methods that cover a wide area of use in academia and industry. We distilled the semantics of the constructs from their official (or most widely accepted) standard or specification. Following this we classified each construct as detailed as possible, after which we iteratively clustered them into a common category. When (superficially) similar constructs diverged in their categorization we denoted the relevant discriminating semantic factor. This was repeated until all constructs were categorized in a minimum amount of categories that were still domain specific (i.e. stopping short of categorizing constructs purely as ENTITY or RELATIONSHIP). The results from our analysis show that there is a common high-level categorization of concepts shared between the different notations and communities, although certain notations lack constructs for some categories (e.g. most GOAL-oriented notations not having constructs to describe results). The results also show a small number of discriminating factors (e.g. necessity, intentionality, materiality) that correlate strongly with

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the focus of a notation or community. These can be used to characterize their respective understanding of some constructs. While the categories of individual notations tend to have a different central focus (e.g. focusing on material or immaterial RESOURCES), they are capable of being abstracted to the same semantic component. Furthermore, many of the notations which are focused on a specific aspect tend to have a greater number of constructs for aspect-specific important concepts that allow them to express a more fine-grained semantics for those concepts than their widely-scoped counterparts. These results support the idea that investigating the detailed personal semantics of different notations used in EA is necessary to ensure the semantic consistency and validity of enterprise models.

Keywords: enterprise modeling, conceptual landscape, ontology, category, prototype