A DSM-based framework for integrated function modelling: concept, application and evaluation

Function modelling is proposed in the literature from different disciplines, in interdisciplinary approaches, and used in practice with the intention of facilitating system conceptualisation. However, function models across disciplines are largely diverse addressing different function modelling perspectives and using different structures and forms for representing the contained information. This hampers the exchange of information between the models and poses particular challenges to joint modelling and shared comprehension between designers from different disciplines. This article proposes an integrated function modelling framework, which specifically aims at relating between the different function modelling perspectives prominently addressed in different disciplines. It uses interlinked matrices based on the concept of DSM and MDM in order to facilitate cross-disciplinary modelling and analysis of the functionality of a system. The article further presents the application of the framework based on a product example. Finally, an empirical study in industry is presented. Therein, feedback on the potential of the proposed framework to support interdisciplinary design practice as well as on areas of further improvement has been obtained from participants working in industry.

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