A Matrix-based Framework to Support Dynamic Modeling of Sociotechnical Systems

Abstract:

In order to create viable sociotechnical systems, such as product-service systems, methods to design and analyze such systems are necessary. Dynamic modeling and simulation techniques such as Agent Based Modeling or System Dynamics are suitable techniques that extend the repertoire of existing model-based systems engineering for this purpose. However, due to the complexity involved in efficiently creating, managing and conducting experiments with a large number of such models, an approach is needed to support the modeling process and create transparency. The key result presented in this paper is a meta-model in the form of a MDM, which contains the domains and dependencies necessary to map the process of dynamic modeling of complex sociotechnical systems. The meta-model is the result of an academic case study, where static and dynamic models of a product-service system have been developed.

Stichworte:

MDM, sociotechnical systems, product-service systems

Kongress-/Buchtitel:

Modeling and managing complex systems

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