A structure-based System Dynamics Approach for Assessing Engineering Design Processes

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Abstract:

The dynamic behavior of engineering design processes is a well-known challenge within engineering. Assessing different possible process sequences for their behavior remains a major challenge within engineering design research. This paper proposes a structure-based System Dynamics approach for assessing engineering design processes for their dynamic behavior. A composition panel within the SD model is introduced to enable an eased modelling and assessment of different process sequence variants. The suggested composition panel incorporates the idea of structural methods such as Design Structure Matrix (DSM) and Multiple-Domain Matrix (MDM) into System Dynamics. By applying the DSM and MDM methods, the SD models for the different sequences become more clearly arranged and more easily to handle. Each process step within the approach is represented by the same composite concept of a rework cycle which enables the addition or deletion of process steps. This allows for a quick modeling of various variants of the engineering design process. Assessing different scenarios of engineering design process sequences by simulation offers
the possibility to further improve the planning and management of engineering design processes by providing an approach to assess their dynamic system behavior.

Stichworte: Engineering Design Process; System Dynamics; Design Structure Matrix; Multiple-Domain Matrix; Process Behavior

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- Einrichtungen > Fakultäten > Fakultät für Maschinenwesen > Institut für Mechatronik > Lehrstuhl für Produktentwicklung (Prof. Volk komm.) > Konferenzbeiträge
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