

Mestrado (MA)

MODULE-BASED PRODUCT FAMILY DESIGN: SYSTEMATIC LITERATURE REVIEW AND META-SYNTHESIS

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ABSTRACT

Increased demand for a greater variety of products has forced many companies to rethink their strategies to offer more product variants without sacrificing production efficiency. In this context, research has found that such a trade-off can be appropriately managed by exploiting the module-based product family (MBPF) design. Over the years there has been active work in developing methods to design MBPF. However, many of them have been created, and consequently exist, in isolation from one other. As a result, the adoption of these methods in the industry is inhibited by the seemingly broad array of material without a coherent organizing structure. To overcome these research limitations, this paper presents a systematic literature review, and meta-synthesis of 69 articles concerning MBPF design published between 1999 and 2018 in the international journals that include research on engineering, production, and operations management. The main contributions of this work include: (i) the formulation of a functional model synthesizing the design methods for MBPF. (ii) The presentation of a structured class of design problems for organizing existing methods and techniques concerning the MBPF design. (iii) The presentation of a construction heuristic to build and assess functional models and classes of design problems.

Keywords: modularity; module-based product family design; modular design, product development; systematic literature review, meta-synthesis

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