An improved design for cellular manufacturing system associating scheduling decisions

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Aims and scope

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Abstract

This paper presents a model for the design of Cellular Manufacturing System (CMS) to evolve simultaneously structural design decisions of Cell Formation (CF) and operational issue decisions of optimal schedule. This integrated decision approach is important for designing a better performing cell. The model allows machine duplication and incorporates cross-flow for scheduling flexibility. The cross-flow is the term introduced to mean the inter-cell movement of parts from parent cell to identical machines in other cells though machines are available in the parent cell. This cross-flow facilitates routing flexibility and paves way for reduced schedule length thereby optimizing resources leading to minimized operational cost. A non-linear integer mathematical programming model is formulated with