A conceptual framework for integrating Facility Layout and Production Scheduling in Flowshop Manufacturing Cells decisions [

2022

text (article)

Analítica

Objective: In this paper, a conceptual framework for integrating production scheduling in flowshop manufacturing cells, known as flowshop group scheduling (FSGSP), and unequal-area facility layout (UAFLP) decisions is proposed. The objective is to define a conceptual model that allows the integration of these important decisions, as well as other comple-mentary decisions, based on a brief literature review. Materials and Methods: First, a brief literature review is carried out to identify the elements, solution techniques and comple-mentary decisions for the UAFLP, FSGSP and layout-scheduling approaches. Then, these elements, solution techniques and complementary decisions are described and considered for the definition of the conceptual framework. Results: Based on the results of the lite-rature review, a 4-phase integrative model is proposed to integrate the UALFP and FSGSP decisions as well as their complementary decisions so that the sum of the material handling and tardiness penalty costs are minimized for a solution alternative. The phases include the input data collection and preparation process, the definition of the UAFLP, FSGSP and their complementary decisions, the optimization of the decisions when exact, approximate, and artificial intelligence techniques have been applied, and the selection of the alternative with the minimum total costs. Conclusions: The integration of these decisions using the proposed framework must be grounded in a lean-manufacturing-based operations strategy whereby the benefits of reducing mudas, such as material handling, high work-in-process in-ventory levels and high machine setup times can be obtained. Finally, the application of this framework, as well as the evaluation of its benefits for a real-world, industrial context can be considered as future research

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Tipo Audiovisual: Conceptual model flowshop group scheduling unequal-area facility layout cellular manufacturing systems material handling costs total weighted tardiness lean manufacturing Modelo conceptual programación de producción de grupos con flujo en línea distribución de instalaciones con áreas desiguales sistemas de celdas de manufactura costos de manejo de materiales tardanza ponderada total producción esbelta

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