REAL TIME SCHEDULING IN FMS: SUITABILITY AND EFFECTIVENESS OF FLEXIBLE PROCESS PLANS

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Abstract

This paper investigates suitability and effectiveness of flexible process plans during FMS scheduling. Flexible process plans are needed to overcome shop floor uncertainties such as non-availability of machines. Previous research reveals that availability of flexible process plans during scheduling improves makespan and mean flow time performance measures but fails to identify the system parameters that affect the suitability and effectiveness of flexible process plans in an FMS. The present paper is an attempt in this direction. An example FMS is taken into consideration and simulated by executing its Petri nets model. Simulation results indicate that flexible process plans are not always followed on the shop floor to overcome the uncertainty of non-availability of machine due to limited buffer space and it is dependent on system configuration and operating environment. Also, availability of flexible process plans always improves makespan and mean flow time. 37 refs.

Key Words: *Scheduling, Flexible Process Plans, Virtual Line & Batch Manufacturing*

ANALYTICAL AND SIMULATION APPROACH FOR DESIGN OF AUTOMATED STORAGE AND RETRIEVAL SYSTEMS

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Abstract

The throughput performance of multi-shuttle Automated Storage and Retrieval Systems (*AS/RS*) versus single-shuttle *AS/RS* is presented in this paper. For single-shuttle *AS/RS* random location assignment policy was applied for storage operation, while for the retrieval operation "First In - First Out" (*FI-FO*) request selection rule was applied. In multi-shuttle *AS/RS*, for storage location assignment policy and for the request selection rule a heuristics strategy, named by "*Strategy x*" is used. Performance comparison of multi-shuttle and single-shuttle *AS/RS* is contrasted for alternative combination of storage rack configuration and storage/retrieval machine velocity profiles. Comparison of the single-shuttle *AS/RS* versus multi-shuttle *AS/RS* shows large improvements in throughput capacities of multi-shuttle AS/RS. 7 refs.

Key Words: *Automated Storage and Retrieval Systems, Analytical Modelling, Simulation Modelling and Performance Analysis*

APPLICATION OF ROBUST DESIGN IN A SUPPLY CHAIN DESIGN PROCESS

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Abstract

The process of supply chain design that will efficiently respond to emerging market demands is of great importance for enterprise competitiveness. Development of methods for the use during the supply chain design process is a research topic not only in scientific community but in industrial also. A method that could be efficiently used during this process has to posses many features. Some of those features are: the appropriateness of the method in order to use it on each of the three supply chain management levels (strategic, tactical and operational), applicability of the method in diverse industrial sectors and maybe the most important feature of all the ability to built-in business environment effects in a supply chain design. In this paper the potential of Robust Design method in a supply chain design process as well as the modelling of a supply chain with the use of method is presented. Modelling is carried out with the use of discrete event simulation and presented on the practical example. 11 refs.

Key words: *Robust Design, Supply Chain, Discrete Event Simulation*