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IPROMMES: Integrating Production Operations and Maintenance into Manufacturing Execution System^{*}

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Abstract

In this paper we present a research project involving different researchers from France and Canada. This interdisciplinary research project concerns the development of open decision support system architecture for joint production and maintenance operations planning at the shop floor level. This project responds to the perceived limitations of current manufacturing execution systems (MES) in term of decision making and to the lack of joint optimization of the production and maintenance operations. The decision support tools include simulation and optimisation approaches (exact and approximate methods). We also aim to overcome the lack of integrated optimization methods across the different decision levels in such systems.

Key words: Maintenance planning, Production planning, Simulation, Optimisation

1 Introduction

The rapid evolution and high competitive nature of today's global markets confer to the function Operation-Production a role of first importance in the global competitiveness of companies. Nowadays manufacturers are facing an economy and an international trade where competition is based on products of high quality and increasing changes offered with lower prices while respecting the due dates of customers. In this context the reduction of costs and the improvement of the quality of the products and services became the main concerns of the industrialists who seek to increase the performances of their companies.

The market becomes global while segmentation is increasing. Consumers tend to require customized products. The advent of the "era of information" necessitates significant adaptations of the manufacturing enterprises. If the Seventies and Eighties were the decades of control of the processes, and if the Nineties made it possible for companies to reach global markets, the new millennium requires industries to acquire agility to face the demands and avoid the risks of these changing markets. It is now necessary to develop new approaches in order to increase the flexibility of the manufacturing companies. Indeed, the current economic environment is characterized by

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