

## **Real-Time Scheduling and Control of Supply Chain Networks: Challenges and Graph-Based Solution Approach**

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**Abstract :** Manufacturing in supply chains requires an efficient organisation of production and transport processes in order to guarantee the supply of all partners within the chain with the material that is needed for the reliable fulfilment of tasks. If one partner is not able to supply products for a certain period, these products might be missing as the working material for the customer to perform the next manufacturing step, potentially as supply for further manufacturing steps. This way, local disruptions can influence the whole supply chain. In order to avoid material shortages, an efficient scheduling of tasks is necessary. However, the occurrence of unexpected disruptions cannot be eliminated, so that a modification of the schedule should be arranged as fast as possible. This paper discusses the challenges for the implementation of real-time scheduling and control methods and presents a graph-based approach that enables the integrated scheduling of production and transport processes for multiple supply chain partners and offers the potential for quick adaptations to parts of the initial schedule.

**Keywords :** production, logistics, integrated scheduling, real-time scheduling

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