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Model-based production cost estimation to support bid processes: an automotive case study.

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Summary: In the automobile supplier industry companies frequently need to make bids, typically based on cost estimates for the production process, to obtain incoming orders. The production process is executed in several main stages, which are linked by intra-plant logistics. To model different scenarios, we consider two separate organizational approaches towards cost estimation. In the first one, all the main stages are optimized via a central authority. The second approach models a decentralized decision making process, as it is currently used in practice. Moreover, we analyze different coordination mechanisms to improve the decentralized approach. To capture the uncertainty during the bid process, associated with key parameters like demand, capacity consumption and cost, we formulate a stochastic version of the model, capturing different risk preferences to compare risk-neutral and risk-averse decision making. The resulting MILPs are solved with CPLEX and results for an illustrative example based on a real data set are presented.

MSC:

90B Operations research and management science

Keywords:

[production modeling](#); [automotive industry](#); [cost estimating](#); [uncertainty](#); [risk analysis](#)

Software:

[CPLEX](#)

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