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Decision support models for production ramp-up: a systematic literature review

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Abstract

Production ramp-up is a critical step in the life cycle of a new product, and efficiently managing ramp-ups is a key to business success and market leadership. To support the planning of ramp-ups in practice, researchers have developed decision support models in the past that help to solve problems that arise during the ramp-up phase, such as lot sizing, the assignment of workers to workplaces or the determination of the capacity of the production equipment. Decision support models for production ramp-up typically consider the specific characteristics of this phase, such as uncertainty, growth in demand, worker learning or imperfect production processes. The aim of this paper is to provide a comprehensive overview of decision support models for production ramp-up and to identify areas where more research is needed. First, the paper develops a conceptual framework of production ramp-up by categorising typical planning problems and process characteristics of the ramp-up phase. Secondly, a systematic literature review with a focus on mathematical planning models for the ramp-up phase is

conducted. The analysis shows that various decision support models that help to realise an efficient production ramp-up exist, but that there are still many opportunities for future research in this area.

Keywords:

ramp-up | production start-up | decision support models | systematic literature review

Disclosure statement

No potential conflict of interest was reported by the authors.

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