
Multi-Objective Workforce and Process Planning For Socio-Economic Sustainable RMS : Lp-metric vs Epsilon Constraint

Alireza Ostovari*¹, Lyes Benyoucef¹, Xavier Delorme², and Hichem Haddou Benderbal¹

¹Laboratoire d'Informatique et des Systèmes – Aix Marseille Université, Université de Toulon, Centre
National de la Recherche Scientifique – France

²Mines Saint-Etienne, Univ Clermont Auvergne, INP Clermont Auvergne – CNRS : UMR6158 – France

Résumé

As a new manufacturing paradigm, reconfigurable manufacturing system (RMS) has shown promising results when dealing with market changes. This study explores the issue of integrating workforce planning and process planning within RMS. The idea is to consider socioeconomic sustainable manufacturing by investigating new KPIs from the social aspect. The choice of workforce flexible work hours and the accident risk are concurrently viewed as social aspects. This challenge has been approached by using a new mixed integer linear model. Furthermore, the model considers other objectives, including operational cost and total completion time. The constraint and Lp-metric are used to solve the multi-objective model for five small and medium-sized instances. The findings demonstrate a 60% variation in reconfiguration time, and processing time contributes to 5% and 7.8% changes in makespan and 25% and 56% in total cost. Finally, some in-depth analysis is performed to illustrate and verify the performance of the suggested solution approach .

*Intervenant