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A parameterizable method for change planning for a flexible flow shop with an integrated shift model planning

Abstract

This thesis focusses on production processes that are organized according to the principle of a flexible flow shop. In a lot of enterprises this principle is common either in a direct way or with a few deviations. Furthermore in reality a dynamic planning environment exists which means that disturbances (rush orders, cancellation of orders, etc.) can occur at any time. To handle this disturbances the general description of a flexible flow shop is extended as the scheduling (with sequence depended setup times, restricted buffers, etc.) and the allocation of cost-effective shift models take place in parallel. So labour costs constitute a big part of the complete production costs and the flexible allocation allows to adapt the available capacity in an effective way.

In the developed method a rolling planning horizon is used to consider the requirements of a dynamic planning environment. In each iteration the different disturbances are best possible integrated in the original generated plan. To resolve the planning problem, different part methods exist, whose structure and sequence can be adapted to different situations with a set of parameters. The developed method was evaluated with the help of methods of mathematical optimization and a benchmarking platform. Very good results could be achieved in the context of this evaluation.