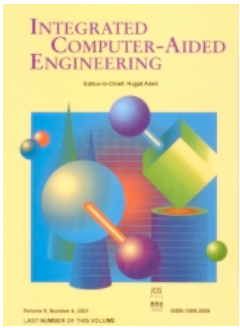
Journal Article



Optimising operational costs using Soft Computing techniques

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Abstract

A Manufacturing Execution System (MES) consists of high-cost, large-scale, multi-task software systems. Companies and factories apply these complex applications for the purposes of production management to monitor and track all aspects of factory-based manufacturing processes. Nevertheless, companies seek to control the production process with even greater rigour. Improvements associated with an MES involve the identification of new knowledge within the data set and its integration in the system, which implies a step forward to Business Process Management (BPM) systems, from which the users of an MES may gain relevant information, not only on execution procedures but to decide on the best scheduled arrangement. This work studies the data gathered from a real MES that is used in a plastic products factory. Several Artificial Intelligence and Soft Computing modelling methods based on fuzzy rules assist in the calculation of manufacturing costs and decisions over shift work rotas: two decisions that are of relevance for the improvement of the execution system. The results of the study, which identify the most suitable models to facilitate execution-related decision-making, are presented and discussed.

Keywords
Applied Soft Computing, artificial intelligence, enterprise resource planning, manufacturing execution systems