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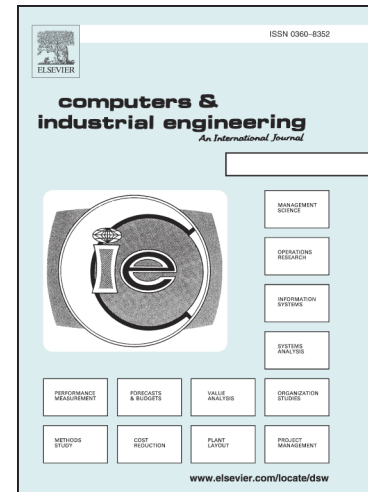
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### **Abstract**

This paper presents a novel social network analysis based method (SNAM) to evaluate the reconfiguration effect i.e., identification of key machines and their influence on the system performance in the context of Flexible job shop scheduling problem (FJSSP). This research formulates a mathematical model along with the constraints by incorporating the total completion time of jobs as an objective function. The proposed SNAM has been applied to generate the collaboration networks by transforming the input data and presenting them in the form of an affiliation matrix to the network analysis software. Thereafter, to analyze the collaboration networks various SNA measures that have been calculated and different functional properties are evaluated. Finally, to investigate the reconfiguration effect on makespan integration of process planning and scheduling (IPPS) has been implemented with adopted effective game theory based hybrid deoxyribonucleic acid (DNA) algorithm. The

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