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Optimization of Inventory Pick-up Time in a Server Manufacturing Environment

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Abstract: In the wake of globalization, companies are emphasizing on being cost competent, which could also be seen in power server manufacturing industries featured by leading edge technologies. These industries have expensive and large variety of components involving high inventory storage and customer service costs. The complexities resulting from extensive quality assurance tests, multi-layer suppliers with varying supply lead times, and complex product configurations affect the entire supply chain. In addition, the power server manufacturing facility considered for this study has been facing a major challenge due to inefficient raw material pick-up process. A meta-heuristic optimization technique, Genetic Algorithm technique, capable of solving small (to medium) size instances is proposed in this study, to facilitate effective planning of zoning and routing for raw material movement. Prior data is analyzed to understand the complexity of the problem, and to study the floor plan using a process map to develop an optimization model to minimize inventory pick-up time. The proposed model can fit into a decision support system for operational planning in this server manufacturing environment and would also be beneficial for similar discrete manufacturing systems.

Keywords: Inventory pick-up, Meta-heuristic Optimization, Genetic Algorithm, Server Manufacturing, Decision Support Systems, Discrete Manufacturing Systems