

Facility layout design for hybrid cellular manufacturing systems

ABSTRACT

Facility layout which is the arrangement of facilities in the shop-floor has a great impact on the performance of manufacturing systems. An effective layout decreases material handling cost, throughput time, lead-time and results in increasing productivity and efficiency of manufacturing systems. Although layout problems have significant roles on the efficacy of manufacturing systems, scant attention has been paid to the layout design in hybrid cellular manufacturing systems. In this paper, a mathematical model for layout problems in a hybrid cellular manufacturing system is proposed that minimizes the total material handling cost (both inter-cell and intra-cell material handling cost). To solve the model, a variant of a simulated annealing algorithm is developed. The results show that the developed algorithm outperforms the algorithm that was benchmarked from the literature in terms of solution quality and computation time.

Keyword: Facility layout; Hybrid cellular manufacturing; Simulated annealing