جـــامعة الفـــيوم
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Degree:Master Degree
Title of Thesis: Cellular manufacturing approach development to improve industrial organizations performance
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ABSTRACT

Due to increasing international competition, shorter product life cycles, variable demand, diverse customer needs, and customized products, manufacturers are forced from mass production to the production of a large product mix. Traditional manufacturing systems, such as job shops and flow lines, cannot provide such requirements efficiently coupled with flexibility to handle these changes. Although, worker performance and capability in handling different machines affect the cell productivity, it doesn't take much attention in recent researches.

A bi-objective mathematical model is presented to solve three-dimensional part-machine-worker assignment problem in CMSs. The objectives of this model are minimizing the total costs, including the inter- and intra-cell material handling costs and production costs, and maximizing the overall quality percentage. The novel aspect of this model is addressing the CF problem simultaneously with the layout planning and worker assignment problems.

The performance of workers on different machines is measured by the average scrap rate of parts processed on each machine by dedicated workers. As the proposed problem is NP-hard, a genetic algorithm is suggested to effectively solve the problem. Finally, numerical examples selected from the related literature are used to verify the performance of the GA and to demonstrate the advantages of the proposed approach.

The summary not more than 500 words