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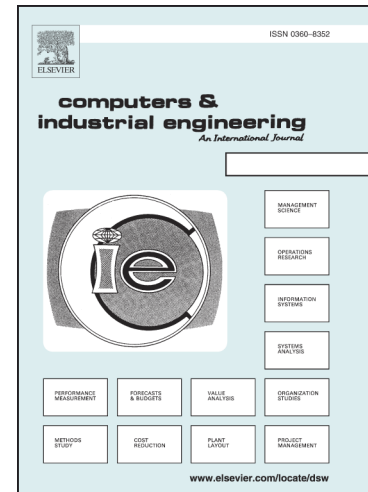
BEES ALGORITHM FOR MULTI – MODE, RESOURCE – CONSTRAINED PROJECT SCHEDULING IN MOLDING INDUSTRY

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PII: S0360-8352(17)30354-6
DOI: <http://dx.doi.org/10.1016/j.cie.2017.08.012>
Reference: CAIE 4859

To appear in: *Computers & Industrial Engineering*

Received Date: 7 April 2017
Revised Date: 4 July 2017
Accepted Date: 10 August 2017



Please cite this article as: Öztemel, E., Ayçim Selam, A., BEES ALGORITHM FOR MULTI – MODE, RESOURCE – CONSTRAINED PROJECT SCHEDULING IN MOLDING INDUSTRY, *Computers & Industrial Engineering* (2017), doi: <http://dx.doi.org/10.1016/j.cie.2017.08.012>

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BEES ALGORITHM FOR MULTI – MODE, RESOURCE – CONSTRAINED PROJECT SCHEDULING IN MOLDING INDUSTRY**Ercan Öztemel¹ & Ayşe Ayçim Selam^{2*}**

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ABSTRACT

In a resource-constrained environment project planning and scheduling becomes an extremely complex problem. For real life project schedules multi-mode resource requirements remarkably increase the complexity of and enlarge the respective solution spaces. Therefore schedulers require systematic methodologies compatible with the real world implementations in order to generate cost effective schedules. Similarly, plastic injection molding is known to be a “make-to order” process. The manufacturing of the mold which is a unique and essential component of plastic injection is considered kind of a project. The aim of this study is set to investigate the possibility of utilizing Bees Algorithm for single-resource, multi-mode, resource-constrained mold project scheduling in order to generate a systematic approach to solve the problems of this nature. A Bee-Based Mold Scheduling Model is therefore proposed and employed on a set of problems with different dimensions for the proof of concept. Detail description of an injection molding project together with respective performance analysis is also provided. After the implementation of the proposed methodology, it is well proven that, even for high number of activities and limited resources, the proposed method generates suitable schedules for the projects of this kind the implementation and respective modelling is explained and the results are discussed in detail within the text.

Keywords: Project Scheduling, Bees Algorithm, Multi-Mode Resource Utilization, Plastic Injection Molding

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In a resource-constrained environment project planning and scheduling becomes an extremely complex problem. For real life project schedules multi-mode resource requirements remarkably increase the complexity of and enlarge the respective solution spaces. Therefore schedulers require systematic methodologies compatible with the real world implementations in order to generate cost effective schedules. Similarly, plastic injection molding is known to be a “make-to order” process. The manufacturing of the mold which is a unique and essential component of plastic injection is considered kind of a project. The aim of this study is set to investigate the possibility of utilizing Bees Algorithm for single-resource, multi-mode, resource-constrained mold project scheduling in order to generate a systematic approach to solve the problems of this nature. A Bee-Based Mold Scheduling Model is therefore proposed and employed on a set of problems with different dimensions for the proof of concept. Detail description of an injection molding project together with respective performance analysis is also provided. After the implementation of the proposed methodology, it is well proven that, even for high number of activities and limited resources, the proposed method generates suitable schedules for the

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