

A matheuristic approach combining genetic algorithm and mixed integer linear programming model for production and distribution planning in the supply chain

Guzman, E.^{a,*}, Poler, R.^a, Andres, B.^a

^aResearch Centre on Production Management and Engineering (CIGIP), Universitat Politècnica de València (UPV), Alcoy, Alicante, Spain

ABSTRACT

A number of research studies has addressed supply chain planning from various perspectives (strategical, tactical, operational) and demonstrated the advantages of integrating both production and distribution planning (PDP). The globalisation of supply chains and the fourth industrial revolution (Industry 4.0) mean that companies must be more agile and resilient to adapt to volatile demand, and to improve their relation with customers and suppliers. Hence the growing interest in coordinating production-distribution processes in supply chains. To deal with the new market's requirements and to adapt business processes to industry's regulations and changing conditions, more efforts should be made towards new methods that optimise PDP processes. This paper proposes a matheuristic approach for solving the PDP problem. Given the complexity of this problem, combining a genetic algorithm and a mixed integer linear programming model is proposed. The matheuristic algorithm was tested using the Coin-OR Branch & Cut open-source solver. The computational outcomes revealed that the presented matheuristic algorithm may be used to solve real sized problems.

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*Corresponding author:

eguzman@cigip.upv.es
(Guzman, E.)

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