

Solving Order Assignment and Products Distribution Problems of A Multi-Plant System Using a Double Threshold Accepting Algorithm

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ABSTRACT

As the industrial structure changing rapidly, in order to win over the product orders, industries expand their plants accordingly or integrate with others to increase their outputs. When the plants are located in different areas and have different capacity, they must consider the cost of products distributing. The aim of this research is assigning the orders to find the best order assignment to suitable plants to minimize the costs of production and distribution.

In this research, a new multi-plant order assignment module with products distribution is considered and a double threshold accepting algorithm is proposed to minimize the total cost. The problem is divided into two phases, the first phase of the problem considers assigning orders to different plants, while the second phase deal with the product distribution routing problems after production. Since the two phases are inter-related, the algorithm applies a feedback mechanism and a iterative approach to take into account the mutual influence between two phases. As a result, the total cost of the system, including production cost, distribution cost and distance cost are minimized.

Furthermore, this research also investigates the best selection of parameter values in the threshold accepting algorithm and four numerical examples are used to test the performance of the algorithm. The results show that this algorithm can solve the problem efficiently and effectively.

Keyword: Multi-plant order assignment Product distribution Threshold accepting