

Public Abstract

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As a company increases their use of warehouse, the excess inventory that cannot be stored in the owned warehouse are transferred to a third-party warehouse in which the company pays rent and transportation cost for storing items and moving items back to the production site. This research introduces the concept of material location selection that allocates materials to these two warehouses while minimizing the total storage and transportation costs. A two-warehouse material flow network model is formulated and then derived to generate five material location policies for evaluating the material flow situation of a real manufacturing company. The result showed that there is around 15%-40% cost saving that the company potentially obtains by systematically allocating materials to warehouses. A material location selection model is then proposed with a two-warehouse production planning model that accounts for workload dependent lead-time. In addition, an inventory rollback algorithm is given as means to bypass imperfect material movement information, in order to analyze inventory levels. Last, an application of the material location selection and production planning models is given as a potential extension of these models for determining an expansion size of the owned warehouse.