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TITLE: FUZZY LOGIC APPROACH TO AGGREGATE PRODUCTION PLANNING AND AN APPLICATION

ABSTRACT

One of the main decision making problems in firms is Aggregate Production Planning (APP). APP aims at evaluating and balancing the work force level, inventory level, regular and overtime production quantities, backordering levels and subcontract requirement as a whole in the process of taking planning decisions over an intermediate time horizon. However, under the changing environmental conditions, parameters such as demands, available resources, capacities and related production costs are often uncertain. Therefore, the data in APP problems should be taken as stochastic or fuzzy rather than deterministic.

In this study, a multi-objective, multi-product and multi-period fuzzy APP problem that is able to reflect real-world features and which does not ignore its uncertainties and ensures decision makers' participation in decision making process by interacting with them during the solution process, has been considered. In order to solve this problem, an Interactive Possibilistic Linear Programming (i-PLP) model has been proposed. By examining the confection department of a textile company operating in Denizli, an aggregate production plan for this department has been prepared in order to demonstrate the applicability of the proposed model in real life. Interactive structure of the model has provided a learning process about the system that the decision makers can learn to achieve better solutions and an efficient solution according to their own preferences. Therefore, with this application it has been revealed that the fuzzy logic provides results closer to reality, human thought and decision-making mechanism for solving APP problems encountered in real life and including uncertainties.

KEYWORDS

Aggregate Production Planning (APP), Fuzzy Logic, Fuzzy APP, Interactive Possibilistic Linear Programming (i-PLP)