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A Survey of Transportation Problem For Numerical Solution of Mathematical problems

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ABSTRACT : *The optimization processes in mathematics, computer science and economics are solving effectively by choosing the best element from set of available alternatives elements. The most important and successful applications in the optimaization refers to transportation problem (TP), that is a special class of the linear programming (LP) in the operation research (OR). The main objective of transportation problem solution methods is to minimize the cost or the time of transportation. Most of the currently used methods for solving transportation problems are trying to reach the optimal solution, whereby, most of these methods considerd complex and very expansive in term of the execution time. In this study we use the best candidate method (BCM), in which the key idea is to minimize the combinations of the solution by choosing the best candidates to reach the optimal solution. There is a hello, how r u? Problems involving transporting products from several sources to several destinations. Although the formation can be used to represent more general assignment and scheduling problems as well as transportation and distribution problems. The two common objectives of such problems are either (1) minimize the cost of shipping m units to n destinations or (2) maximize the profit of shipping m units to n destinations. Comparatively, applying the BCM in the proposed method obtains the best initial feasible solution to a transportation problem and performs faster than the existing methods with a minimal computation time and less complexity. The proposed methods are therefore an attractive alternative to traditional problem solution methods. The BCM can be used successfully to solve different business problems of distribution products that are commonly referred to transportation problems.*

KEYWORDS: *: Operation research, transportation problem, linear programming, optimization problems, transportation model, Vogel's approximation method, best candidate's method, optimal solution, solving optimization, and objective function.*

INTRODUCTION: Down through The problem of minimizing the total cost of transportation has been studied since long and is well known. In a time minimizing transportation problem, the time of transporting goods is minimized to satisfy certain conditions in respect of availabilities at sources and requirements at destinations. The basic difference between cost minimizing and time minimizing transportation problem is that the cost of transportation changes with variations in the quantity but the time involved remains unchanged and irrespective of the quantities. The time minimizing transportation problem has been studied by Hammer [1, 2], Garfinkel and Rao [3], Szware [4], Bhatia, Swarup and Puri [5], Ramakrishnan [6], Sharma and Swarup [7], Seshan and Tikekar [8] and by several other authors. Time-cost trade off means the problem of minimizing the transportation cost in addition to minimizing the time of the transportation. Time-cost trade off analysis has been discussed by Satya Prakash [9], Bhatia, Swarup and Puri [10] and several other authors. Satya Prakash [9] has used goal programming approach to solve the problem. Liu [11] discussed a method for solving the cost minimization transportation problem with varying demand and supply. Most of the models developed for solving the transportation problem are with the assumption that the supply, demand and the cost per unit values are exactly known. But in real world applications, the supply, the demand and the cost per unit of the quantities are generally not specified precisely i.e. the parameters are fuzzy in nature. Impreciseness in the parameters means the information for these parameters are not complete. But even with incomplete information, the model user is normally able to give a realistic interval for the parameters. Carlsson and Korhonen [12] and Chanas [13] discussed parametric approach to deal with the fuzzy parameters. In this paper cost and time minimization transportation problem has been dealt when the supply, the demand and the transportation cost per unit of the quantities are fuzzy. Impreciseness in the parameters has been dealt with using the concept developed in Ref. [12] and for the time minimization; the set of times (required for different sources to different destinations) is partitioned suitably. Linear and exponential membership functions have been considered for the imprecise parameters. The problem has been posed as multi objective linear programming problem and solved using preemptive goal programming approach by assigning different priorities to the different objectives. The model intends to obtain a compromise solution with minimum transportation cost as well as minimum transportation time.