

An MCDM Model for a Facilities Location Applied to a Float Glass Manufacturer

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Abstract

Facilities Location is a vital aspect of distribution management. It plays an essential role in the distribution management of manufacturing firms as well as the service sector. In this paper, the model developed is applied to a leading float glass manufacturer in the Philippines.

Similar to any decision making endeavor, cost always play a major role. In this study an integrated distribution cost model is developed. The Total Distribution Cost (TDC) takes into account the interdependence between facilities location, transportation, and inventory levels. In reality however, decision makers do not solely decide based on the cost effectiveness of alternatives. Often, multiple and conflicting objectives need to be simultaneously considered. Thus a goal programming model is developed and solved using sequential linear programming.

The developed model is applied to the search process of the float glass manufacturer for an external finished goods warehouse. Initially, the distribution costs are computed for all the defined external warehouse strategies. The values are assigned as the cost coefficients of the first objective that aims to minimize cost of operations. The other objectives such as: minimization of capital expenditures, maximization of accessibility coefficients and strength of structure as well as the proximity coefficients are all translated into mathematical equations. Furthermore, these objectives are simultaneously considered using goal programming. Various scenarios are depicted to determine the sensitivity of the model developed, and for each of these, an optimum facilities site location is identified.