

EVALUATION OF LOGISTIC DISTRIBUTION CENTER SELECTION USING THE FUZZY MCDM APPROACH

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Received August 2009; revised February 2010

ABSTRACT. *This paper intends to propose an evaluation method to assess locations of logistic distribution center (LDC). In the investment of logistics service providers, it is crucial to select logistic distribution center to maximize their profits and minimize the costs. In the decision-making process, the human preference model usually involves uncertainty and it is extremely difficult for decision makers to express the strengths of their preferences. To solve this problem, this paper establishes a fuzzy multiple criteria decision-making (MCDM) model based on fuzzy AHP for the LDC assessment so that decision makers can express their preference with uncertainty.*

Keywords: Fuzzy AHP, Fuzzy MCDM, Logistic distribution center (LDC), Location selection

1. Introduction. Recently, with the rise of convenience stores, supermarkets and warehouses, enormous changes have occurred in the marketing channels. The traditional multi-level complex marketing channel has gradually transformed from the suppliers to retail sites. This type of modern marketing channel primarily relies on the establishment of an effective logistic distribution center (LDC) for enterprise to reduce cost, save time, and increase benefits, especially when manufacturers face the marketing globalization. Selection of LDC is a key bridge link between customers and manufacturers in the supply chain. LDC may have impacts on organizational performance through several important activities such as raw material availability, human resource and distribution network.

The selection processes of LDC generally involve the imprecision and vagueness inherent in linguistic assessment. The decision of LDC location is a multi-criteria decision-making (MCDM) problem since the decision depends on a variety of factors. Literatures have been published on related issues. Lee et al. [1] took into account the environmental issues when selecting suppliers. They proposed a green supplier selection model in which environmental criteria such as pollution control, environment management and green image, etc. are added into traditional selection model. Chou [9] proposed a fuzzy multiple-criteria decision-making (FMCDM) method for the evaluation of investment risk for international container port wharf under uncertain risk environment. In his model, he proposed triple multiplication method for triangular fuzzy numbers. Cabrera et al. [2] presented a mathematical model for new retail stores location. Game theory was used to reflect the competitive effects in location decisions. They used an exhaustive enumeration process to establish all the Stackelberg equilibrium points for new facilities location.