

## **Fuzzy mathematical model for solving supply chain problem**

### **ABSTRACT**

In a real world application supply chain, there are many elements of uncertainty such as supplier performance, market demands, product price, operation time, and shipping method which increases the difficulty for manufacturers to quickly respond in order to fulfil the customer requirements. In this paper, the authors developed a fuzzy mathematical model to integrate different operational functions with the aim to provide satisfy decisions to help decision maker resolve production problem for all functions simultaneously. A triangular fuzzy number or possibilistic distribution represents all the uncertainty parameters. A comparison between a fuzzy model, a possibilistic model and a deterministic model is presented in this paper in order to distinguish the effectiveness of model in dealing the uncertain nature of supply chain. The proposed models performance is evaluated based on the operational aspect and computational aspect. The fuzzy model and the possibilistic model are expected to be more preferable to respond to the dynamic changes of the supply change network compared to the deterministic model. The developed fuzzy model seems to be more flexible in undertaking the lack of information or imprecise data of a variable in real situation whereas possibilistic model is more practical in solving an existing systems problem that has available data provided.

**Keyword:** Supply chain; Fuzzy model; Possibilistic model; Undertainty; Triangular fuzzy number

