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## **Design of Multi-Echelon Supply Chain System to Optimize Cost and Service Levels with Supplier Selection**

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**Abstract:** This paper addresses supplier selection and design of multi-echelon supply chain network. There are four echelons in the network mainly, manufacturer, distribution centers, warehouses, and retailer stores (customer zones). The sourcing of these echelons and their distribution strategies are discussed in details to optimize the cost and service levels. The mathematical formulation is carried out in Mixed Integer Linear Programming (MILP) with the help of Generic Algebraic Modeling System (GAMS). The objectives are to minimize total cost of the flow of products and the fixed cost associated with opening an entity, and to maximize the customer service levels. The effect of customer demand volatility on the service levels is reduced with strategic storage and aggregation maximize service level in each echelons with high variability to get necessary low volatility in service levels, with achieving higher service levels in return.

*Keywords:* Supply Chain Design, Supplier Selection, Multi-Echelon, Aggregation