

Development of an Optimised, Automated Multidimensional Model for Supply Chains

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Abstract : This project divides supply chain (SC) models into seven Eras, according to the evolution of the market's needs throughout time. The five earliest Eras describe the emergence of supply chains, while the last two Eras are to be created. Research objectives: The aim is to generate the two latest Eras with their respective models that focus on the consumable goods. Era Six contains the Optimal Multidimensional Matrix (OMM) that incorporates most characteristics of the SC and allocates them into four quarters (Agile, Lean, Leagile, and Basic SC). This will help companies, especially (SMEs) plan their optimal SC route. Era Seven creates an Automated Multidimensional Model (AMM) which upgrades the matrix of Era six, as it accounts for all the supply chain factors (i.e. Offshoring, sourcing, risk) into an interactive system with Heuristic Learning that helps larger companies and industries to select the best SC model for their market. Methodologies: The data collection is based on a Fuzzy-Delphi study that analyses statements using Fuzzy Logic. The first round of Delphi study will contain statements (fuzzy rules) about the matrix of Era six. The second round of Delphi contains the feedback given from the first round and so on. Preliminary findings: both models are applicable, Matrix of Era six reduces the complexity of choosing the best SC model for SMEs by helping them identify the best strategy of Basic SC, Lean, Agile and Leagile SC; that's tailored to their needs. The interactive heuristic learning in the AMM of Era seven will help mitigate error and aid large companies to identify and re-strategize the best SC model and distribution system for their market and commodity, hence increasing efficiency. Potential contributions to the literature: The problematic issue facing many companies is to decide which SC model or strategy to incorporate, due to the many models and definitions developed over the years. This research simplifies this by putting most definition in a template and most models in the Matrix of era six. This research is original as the division of SC into Eras, the Matrix of Era six (OMM) with Fuzzy-Delphi and Heuristic Learning in the AMM of Era seven provides a synergy of tools that were not combined before in the area of SC. Additionally the OMM of Era six is unique as it combines most characteristics of the SC, which is an original concept in itself.

Keywords : Leagile, automation, heuristic learning, supply chain models

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