

Multi-criteria Decision Approach to Measure Complexity Level in Supply Chain

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Abstract

Growing trend of market competition and higher customer demands with more preferences are creating a complex scenario within global business environment. Today's greater product variety, shorter product life cycle and lower production costs are pushing companies to look beyond their own boundaries, thereby, creating complexity in the management of the supply chain. Supply chain complexity creates uncertainties and disruptions, thereby reducing the performance of the entire supply chain. Although dealing with complexity is not easy, various studies have shown that if managed well, it leads to better supply chain performances. To manage complexity, the management should understand the associated complexity drivers and level of supply chain complexity. This research identifies twenty-two complexity drivers of supply chain. Further, the study proposes integrated AHP and Grey relational analysis to quantify the level of supply chain complexity based on the identified drivers. A case study from a multinational company is illustrated to demonstrate the applicability of the proposed method, and the practical implication of the results obtained is discussed. Results show that the supply chain complexity level of the case company is low, signifying that there is a huge scope of improvement in the case company in terms of managing complexity. Moreover, results show that the case company mainly needs improvement in "internal communication and information sharing," and "compatibility of SC network" to minimize complexity in their supply chain.

Keywords

Complexity drivers, Supply chain complexity, Analytical hierarchy process, Grey relational analysis