World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:18, No:12, 2024

Quantitative Comparison Complexity and Robustness of Supply Chain Network Based on Different Configurations

Authors : Ahmadreza Rezaei, Qiong LIU

Abstract : Supply chain network made based on suppliers and product architecture design. these networks are complex and vulnerable that may be expose disruption risks. any supply chain network configuration has its own related complexity and robustness that can have direct effect on its efficiency. So it's necessary to evaluate any configuration with considering complexity and robustness aspects together. However, there is a lack of research about this subject to managers can evaluate their supply chain configurations and choose configuration with balanced complexity and robustness together. In this study, developed indicators improve robustness of supply chain with using framework to evaluate relationships between complexity and robustness of supply chain network under different network configurations . this framework includes Investigation and analysis of quantitative indicators based on network characteristics. Moreover, overall metrics of Shannon entropy is presented to evaluate network topological complexity. So we will analyze two factor of complexity and robustness of networks based on supply chain configurations As result, Complexity and Robustness are two integral components of network that show network resistances under disruption. It's necessary to attain a balanced level of complexity and robustness in network configurations. the proposed framework could be used in supply chain network to improve efficiency.

Keywords : supply chain design, structural complexity, robustness, supply chain configuration, Shannon entropy
Conference Title : ICIMSE 2024 : International Conference on Industrial and Manufacturing Systems Engineering
Conference Location : Macau, China
Conference Dates : December 16-17, 2024