Proceedings of the 3rd Annual World Conference
of the Society for Industrial and Systems Engineering,
San Antonio, Texas, USA
October 20-22, 2014

Measuring the Resilience of Multi-Level Supply Chain Systems

A. T. Almaktoom, S. Alsobhi, K. K. Krishnan, and P. Wang

Department of Industrial and Manufacturing Engineering
Wichita State University, Wichita, Kansas USA

Corresponding author's Email: atalmaktoom@gmail.com

Abstract: In the emerging area of supply chain system management under uncertainty, resilience has been rarely studied. In the case of upstream factory-to-factory supply chain system, the resilience concept remains unexplored. To measure the risks and resilience of a supply chain system, resilience must be properly defined within the context of a supply chain system and then the relationship between the various supply chain elements must be studied. It is also necessary to identify the link between risks and uncertainties in supply chain system, and develop approaches for managing supply chain system resilience issues. The aim of this research is to define and explore supply chain system resilience models and theories and develop an innovative quantitative measure to calculate supply chain system resilience. The developed quantitative measure is able to evaluate the resilience of all members in the supply chain system and the overall system such that the design of a resilient supply chain system becomes possible. Case studies of advanced supply chain systems are developed to demonstrate the proposed quantitative resilience measure. Case study results indicate that the developed measure is capable of quantifying the resilience of ant member in the supply chain system and overall system under dynamic circumstances.

Keywords: Supply Chain System, Resilience Measure, Risk