

Management and Industrial Engineering

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Chapter 5

Operational Risk Prioritization in Supply Chain with 3PL Using Fuzzy-QFD

Juan Carlos Osorio-Gómez, Diego Fernando Manotas-Duque,
Leonardo Rivera-Cadavid and Ismael Canales-Valdiviezo

Abstract Supply chain risk management is an important activity in current supply chain management. Operational risk is one of the most important risks in supply chains. The operational risk assessment process includes risk identification and evaluation and prioritization. On the other hand, the participation of Third-Party Logistics providers (3PL) in supply chains has been increasing, because companies want to focus on their core business and there are reports of benefits associated with the outsourcing of their logistics activities. However, it is also important to consider how the presence of 3PL providers affects risk management. The prioritization of risks must consider different dimensions and their effect on the global performance of the supply chain. We propose a multicriteria approach for risk assessment in a 3PL company. We present an integrated QFD-Fuzzy Logic proposal for the prioritization of operational risks identified on a supply chain, according to their impact on the most important performance indicators. This proposal is applied to two case studies for Colombian companies: A company that employs a 3PL for ground transportation and a maritime shipping company that ships internationally.

Keywords Supply chain risk management · Operational risk · Multicriteria · Fuzzy-QFD · Freight transportation · Maritime transportation

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