SUPPLY CHAIN RISK MANAGEMENT USING ANP

Elena Rokou  
School of Mechanical Engineering  
National Technical University of Athens  
Athens, Greece  
E-mail: erokou@mail.ntua.gr

Konstantinos Kirytopoulos  
School of Natural and Built Environments  
Barbara Hardy Institute  
University of South Australia  
Adelaide, Australia  
E-mail: Konstantinos.Kirytopoulos@unisa.edu.au

Abstract

Supply chain risk management (SCRM) has recently gained interest both from the practitioners and the researchers due to the increased request for efficiency and the diminishing margins for deviations. Organizations aim to achieve their goals for varying levels and types of supply-chain risks. Identifying and dealing with supply chain risks involves a great amount of subjectivity and uncertainty. Analytical examination of the risks related to a specific supply chain is a tedious task due to the lack of available data. This difficulty is accentuated when there are significant variations of the environmental parameters and/or the amount of available information is not sufficient. The proposed approach aims at providing a method for qualitative risk analysis after the risk identification. The risk identification utilizes the withstanding knowledge related to each echelon of the specific supply chain and to the supply chain as a whole. This data is used to form the risk break down structure that is the main input of the proposed approach. The Analytical Network Process is used for the risk analysis following a multi-criteria approach. The process is applied on the lower RBS level. The risks composing the specific level define the set of alternatives to be ranked. A number of criteria defined by the group of decision makers (supply chain managers and risk analysts) are used for comparing the alternative solutions. The ranking, results on the definition of priorities, for taking mitigation actions. Having in mind that the risk identification and the criteria definition are done once per supply chain and updated when needed, we get a quick way for analyzing supply chains risks. However, as it is expected the more knowledge we get about the specifics of the under question supply chain the higher accuracy has the proposed approach.