

Abstract

Purchasing and supply management are widely acknowledged as strategic for companies. To make a prudent supplier selection decision, it is important to plan for uncertainty to mitigate risk. The study aims to address the risk which originates at the suppliers end. In this dissertation the focus is on categorization and prioritization of the risk elements and addressing a supplier selection problem with the risk elements under consideration.

The first objective of the research is to provide initial insights into how supply risk is defined, discovered, assessed, and managed and to develop an understanding of its implications. The second objective is to devise a method for prioritization of the risk elements and to create a supplier selection model with the risk elements under consideration. The work plan can be divided in two parts. The first part deals with case study and the second part with model building. Case studies were used within a limited set of companies. Based on the research questions raised, propositions were placed and tested. The scope of supply risk was defined in terms of perfect order from individual supplier and outcomes, which include the inability to meet customer requirements in terms of quality, time, cost and order completeness/correctness. The case study findings indicated that purchasing organizations implement various supply management tools that have a secondary purpose to discover supply risk. It was found that the extent to which purchasing organizations manage supply risk is related to the perceived degree of supply risk. It was generally observed that the managers considered risk related data to be insufficient or vague specially related to relatively rare events.

In the second part of the work, the model was developed to enable decision makers to reduce risks when sourcing. The focus is on prioritization of the risk elements followed by supplier selection problem. The work is centered on the development of an algorithm that is capable of solving a supplier selection problem using fuzzy logic. The techniques utilized are Pattern matching and Yager's methodology which have, in various forms, been applied in other environments. The methods are scalable and new knowledge and information can be accommodated at any stage. The rest of the work focuses on quantification of the supply risk by the fuzzy system enabling purchasing organizations to appreciate the risk involved with a given supplier. The fuzzy rules are fired based on the input variable for the suppliers, and the supplier risk score is computed. The results will be helpful for comparing suppliers objectively on the basis of inbound risk and make the optimum supplier selection decision. This can help practitioners to address the missing link between the supplier selection and supply risk management.