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Risk Assessment in Automobile Supply Chain

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Abstract

One of the challenges that have gained industry's attention is assessing supply chain risks with increasing exposure to disruptions, it is vital for supply chains to manage risks proactively. Across industries, one-third of all supply chains fail to manage risk on a formal basis. The story is slightly worse for automotive companies, with 37 percent acknowledging no formal practices for monitoring risk. Automotive companies trail top supply chains in implementing risk management practices. Prediction of potential failure points and overall impact of these risks is challenging. In this research, we aim to assess the major risks that are encountered in supply chain of automobile industry. The purpose of this paper is to develop a holistic, systematic and quantitative risk assessment for measuring the overall risk behavior. We have used FAHP modeling and further analysis is carried out using Chang's Extent Analysis Technique. A systematically developed design can be employed to capture the dynamic behavior of risks.

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Keywords: Supply Chain,Risk Assesment,AHP,Pair-wise comparision matrix,FAHP,Change extent Analysis

Introduction

A supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer. Risk assessment is defined as the process of analyzing the vulnerability to threats and recommending solutions to reduce the level of risk to an organization. The risk

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assessment process thus covers the most critical function of risk management [11]. Analytical hierarchy process was used to model supply chain risk assessment [4, 5].

Supply chain is a set of firms that pass materials forward. Normally, several independent firms are involved in manufacturing a product and placing it in the hands of the end-user in a supply chain — raw material and component producers, product assemblers, wholesalers, retailer merchants and transportation companies are all members of a supply chain [15]. By the same token, define a supply chain as the alignment of firms that brings products or services to market. Note that these concepts of supply chain include the final consumer as part of the supply chain [16].
Another definition notes a supply chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services delivered to the ultimate consumer [11].
Various other definitions of a supply chain have been offered in the past several years as the concept has gained popularity. The basic supply chain is as shown in figure 1.

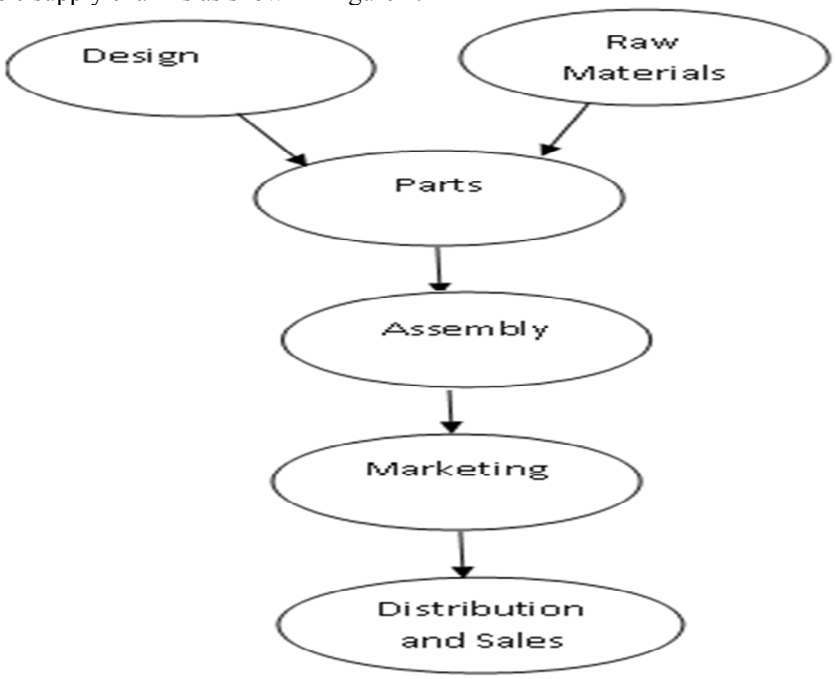

Fig.1. Supply chain of Automobile Industry

- The processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies; and
- The functions within and outside a company that enable the value chain to make products and provide services to the customer [24].

In most of the real-world problems, some of the decision data can be precisely assessed while others cannot. Humans are unsuccessful in making quantitative predictions, whereas they are comparatively efficient in qualitative forecasting [25]. These applications are performed with many different perspectives and proposed methods for fuzzy AHP. In this study, extent analysis on fuzzy AHP is formulated for a selection problem [26].
The fuzzy AHP technique can be viewed as an advanced analytical method developed from the traditional AHP. Despite the convenience of AHP in handling both quantitative and qualitative criteria of multi-criteria decision making problems based on decision maker's judgments, fuzziness and vagueness existing in many decision-making problems may contribute to the imprecise judgments of decision makers in conventional AHP approaches.