

# Chapter 5

## Fuzzy–AHP: A Boon in 3PL Decision Making Process

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### ABSTRACT

*Logistics activities are performed in order to balance the operational chains of firms. The selection of the Third Party Logistics (3PL) is a challenging task for each organization, which involves various factors and attributes. The presented methodology acts as a boon and aids the decision makers for effectively choosing the appropriate Third Party Logistics (3PL) network. In the revealed work, the authors explored fuzzy sets theory and presented a fuzzy AHP model to facilitate the managers of organizations to deal with the Third Party Logistics (3PL) decision making problems. The overall performance of defined Third Party Logistics (3PL) Service Providers are greatly influenced by many significant parameters: quality, reliability, service assurance, shipment cost, customer relationship, etc. The authors have considered various significant parameters: service level, financial security capabilities, location, global presence, relationship management, and client fulfillment representing first level indices. These parameters have chain of various sub-parameters, represented as second level indices, whose importance is affecting the judgment of the decision makers. Various researches have constraint their work up to first level indices and have not considered the second level indices, which is a crucial part of today's practical decision making process. The authors have considered this issue as research gap and transformed this research gap into research agenda. The authors applied an AHP (Analytical Hierarchy Process) accompanied with fuzzy set theory in order to solve industrial Logistics problems. The objective of chapter is to propose a fuzzy based AHP method towards solve benchmarking (preference orders of defined alternatives under criteria) problems. The presented method facilitates the managers of firms to make the verdict towards choosing the best Third Party Logistics (3PL) service provider. A numerical illustration is provided to validate the method application upon module.*

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## AT A GLANCE

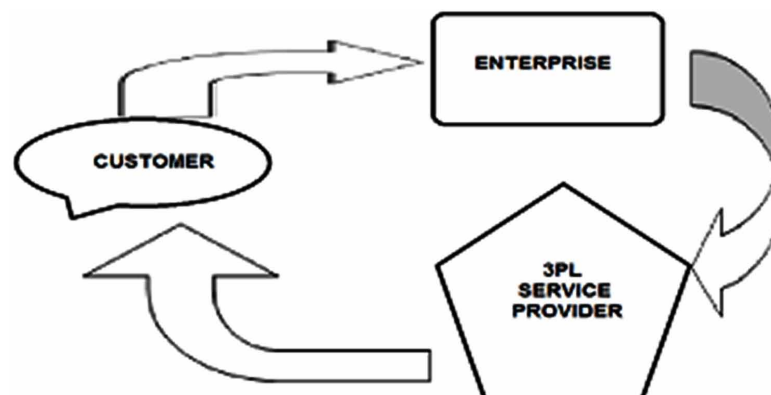
The fuzzy set theory is ever considered as an effectual mathematical tool for modeling non crisp, vagueness and unclear information into mathematical data. The proposed chapter deals with the application of AHP (Analytical Hierarchy Process) accompanied with fuzzy set theory in order to diagnose industrial Logistics problems. The aim of chapter is to display effectiveness of a fuzzy based AHP method towards solve benchmarking (preference orders of defined alternatives under criteria) problems.

## INTRODUCTION

Thousands of decisions are made every day in extent of Logistics activities. All decisions are neither participating in building the reputation nor rupturing the organization profit, but every decision measures the success or failure of organization. Hence decision making is an important aspect, which employs choosing a particular course of action, after considering the possible options. In today's competitive globalization world, every organization has its prime focus compensate customer's demands and also provide high quality product and low cost under less lead time. Logistics processes help the enterprises to achieve their competitiveness and enhance their commercial status by providing systems and processes to advance their customer service quality.

According to Lambert (2008), "Logistics is the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of origin/consumption to the point of consumption/ origin for the purpose of capturing value or proper disposal" (p. 163). According to Folinas (2012), "Logistics is the process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements and includes inbound, outbound, internal and external movements" (p. 389). To satisfy their customer's requirement, the organizations are outsourcing logistic services from separate enterprises, which are not the core part of the organization known as Third Party Logistics (3PL) Service Provider (Figure 1). Hence Logistics outsourcing or Third Party Logistics (3PL) service provider is an emerging trend in the global market.

*Figure 1. A 3PL Supply Chain Management Network*



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