

Hybrid model for making Tactical and Operational decisions in land transportation for the case of a perishable Supply Chain

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ABSTRACT

Under the current conditions of mobility in Bogotá DC (Colombia), companies must give importance to decision making in Transport Management for the three levels of planning: *strategic, tactical and operational* in land transportation that is the most important in the city because has not local rail transportation. The decisions maker seeking to minimize mainly the cost and then maximize the efficiency and service level, but the scope of this work is to only tactical and operational, does not include purchases or improvements in infrastructure (roads, terminals, vehicles). This work is the final product of a research project funded by Universidad Católica de Colombia, "Development and application of a model and methodology for decision making in transport management in the Supply Chain (SC)" where the hybrid method presented is validated for a SC perishable food sector. This paper presents a methodology for collecting and analyzing data in the sector, then in the first phase the decision maker selects tactically the route of intervention considering organizational policies, with the Multi Criteria Decision Technique: PROMETHEE, and in the second stage decides operatively to improve the current distribution of products to the selected paths arranged as tactically: Path Networks Suba and Engativá (Bogotá, Colombia) using a Vehicle Routing problem (VRP) in short presentation with Traveling Sales Problem (TSP).

KEYWORDS

Supply Chain Management, Transportation Management, Vehicle Routing Problem (VRP), Multi Criteria Decision Aid (MCDA), PROMETHEE, tactical and operational decisions.

1. INTRODUCTION

The purpose of a SC is to maximize the total value generated from a set of suppliers seeking to share decisions, infrastructure and services at the same time, in order to satisfy a set of customers in terms of time, form, quantity, quality, place and possession of a product or service (Chopra & Meindl, 2008; Urzelai Inza, 2006) , the administration of these relationships, the flow of information and products upstream suppliers and downstream consumers looking to offer added value at a lower cost for the entire set of SC (Ballou, 2004; Christopher, 2005; Heizer & Render, 2004; Lambert, 2008; Wisner, Tan, & Leong, 2009). Transport Logistics is a function of the SC (Hugos, 2006) with high costs in the supply and distribution channels (Heizer & Render, 2004).

The decision making process is an everyday aspect in the management and administration of (industrial or service) production systems, different techniques from operations research and statistics have been designed for this purpose; makers of "experts" seeking decisions these tools and evidence, to provide an element of objectivity provided by the formal sciences. Decision making in transport management for SC, have high complexity, because it is responsible for the shift from a source to a destination of materials, supplies and finished goods; covers