

# **A hybrid approach for a Strategic planning problem represented by a three-echelon logistics network**

**Yahya HAMADA**

PhD Student at ENSIAS  
Cedoc ST2I – Operational Research and Logistics (ROL)  
MOHAMMED V UNIVERSITY IN  
RABAT, MOROCCO  
[yahya.hamada@gmail.com](mailto:yahya.hamada@gmail.com)

**Youssef BENADADA**

Operational Research and Logistics (ROL)  
Department of Informatics and Decision Support (IAD),  
Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes (ENSIAS),  
MOHAMMED V UNIVERSITY IN  
RABAT, MOROCCO  
[yss.benadada@gmail.com](mailto:yss.benadada@gmail.com)

**Bernard GENDRON**

CIRRELT  
University of Montréal  
C.P. 6128, Succursale Centre-Ville  
Montréal, Québec, Canada H3C 3J7  
[bernard.gendron@cirrelt.ca](mailto:bernard.gendron@cirrelt.ca)

## **Abstract**

This article aims to elaborate a strategic plan allowing to decision makers to take right decisions (Selecting suppliers, Selecting plants that can produce a specific product, ..) in the right moment in order to minimize the generated costs

It is in this context that our work is being taken. The objective is to model and solve a strategic planning problem at three levels which are: supplier-plant, plant-plant and plant-customer. The costs taken into effect in this model are: the supply costs, production costs and transport costs.

The problem belongs to the CFLP Family (Capacitated Facility Location Problem) with a NP-hard complexity. The objective of our MIP problem is to maximize a production company benefits through minimizing costs mentioned above.

Given the limitations of exact methods and the optimum local problem when we used a heuristic method like a LNS (Large Neighborhood Search), we proposed to solve this problem using hybridization between two heuristics: LNS & Genetic Algorithm

This hybridization will give us more opportunities to find better solution when a local optimum is reached.

## **Keywords**

Supply Chain Management; Capacitated Facility Location Problem; LNS; Genetic Algorithm; Hybridization.

## **Biography**

**Yahya HAMADA** Is a PhD Student at ENSIAS ( Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes), Mohammed V University In Rabat, Morocco, member of Operational Research and Logistics (ROL) in Cedoc-ST2I (Centre des Etudes Doctorales en Sciences des Technologies de l'Information) . His research interests include Supply Chain Management, optimization, and scheduling.

**Youssef BENADADA** is a Professor, Head of Operational Research and Logistics (ROL), Head of the Department of Informatics and Decision Support (IAD), Coordinator of the e-Logistics Engineering (IeL) at ENSIAS (Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes), Mohammed V University, Rabat, Morocco and PhD in Informatics from University of Montréal. He has published journal and conference papers. His research interests include Distribution of petroleum products, generalized fractional programming, Supply Chain Management, optimization, and scheduling.

**Bernard GENDRON** is a Professor at the Department of Computer Science and Operations Research at the University of Montréal. His research interests include integer and combinatorial optimization, large-scale optimization and parallel computing, and location and network design problems applied to transportation logistics and telecommunications. He is affiliated to the Centre for Research on Transportation at the University of Montréal and has held positions of Visiting Professor at MIT, EPFL, Pisa, Versailles and Valenciennes. During his recent sabbatical (2003), he worked at ILOG, Paris. He is Chair of the Montreal Chapter of the Canadian Operational Research Society (CORS), and has served as Chair of CORS (2004-2005) and Chair of the Section on Transportation Science & Logistics of INFORMS (2002-2003). He was awarded the CORS Practice Prize (2004) and the CORS Service Award (2006)