

Optimize Lean Supply Chain Design under Uncertainties by Hybrid Meta-Heuristics

Thi Hong Dang Nguyen

Mechanical/ Manufacturing Engineering Department
École de technologie supérieure (ÉTS), Université de Québec
Montréal, H3C1K3, Canada
thi-hong-dang.nguyen.1@ens.etsmtl.ca

Thien My Dao

Mechanical/ Manufacturing Engineering Department
École de technologie supérieure (ÉTS), Université de Québec
Montréal, H3C1K3, Canada
Thien-My.Dao@etsmtl.ca

Abstract

The paper introduces one new approach to optimize the design of Lean supply chain under uncertain scenarios by hybrid meta-heuristics. The main purpose of this study is to figure out some potential measures which can keep Lean supply chain both Lean and sustainable in chaos environment nowadays. First of all, we propose one theoretical framework to transform fat supply chain into Lean supply chain in neutral circumstance. The framework utilizes suitable Lean tools/techniques to eliminate non-added-value factors of supply chain and makes it lean. Nevertheless, when becoming Lean, the supply chain turns out vulnerable system under threats because there is no/very less available backup for any unexpected shortages. Thus, to maintain its sustainability, in next step, we investigate the effects of multi-risks sources occurring from reality on Lean supply chain structure. From then, we propose some necessary contingency plans to quickly response the unpredicted problems and mitigate the consequences. All of prepared plans are examined and integrated into the design stage. Finally, the aforementioned issue is then illustrated in detail through one numerical example and resolved by a hybrid meta-heuristics.

Keywords: Lean Supply Chain Design, Uncertainties, Optimization, Hybrid Meta-Heuristics

Biography

Thi Hong Dang Nguyen is PhD student of Mechanical/ Manufacturing Engineering Department, École de technologie supérieure (ÉTS), Université de Québec, Canada. She earned B.S. in Electrical and Electronic Department, and MBA in School of Industrial Management from Ho Chi Minh City University of Technology. She worked in industry for seven years and used to be lecturer at School of Industrial Management from Ho Chi Minh City University of Technology for five years. Her research interests include Lean supply chain design, optimization and hybrid meta-heuristics.

Thien My Dao is an expert in the study of manufacturing systems, reliability, and maintenance. His areas of focus include computer-assisted design, and the implementation and management of manufacturing systems. His development and research activities include research applied to performance analysis and reliability, optimal design/management of manufacturing systems through simulation, the neural systems approach, the evolutionary approach, fuzzy logic, and using the cellular/just-in-time production concept. Professor Dao has worked in industry for four years.