Optimization design of Closed-Loop supply chain based on stochastic analysis and SMART

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Abstract

Network optimization is a crucial topic in logistics. Efficiencies, effectiveness, and customer responsiveness are the factors to consider in the optimization process. Closed-Loop Supply Chains are network configurations that achieve an optimal integration of the forward logistics and the reverse logistics of an enterprise. Mostly, deterministic and stochastics models focus on minimizing costs (transportation, distribution, production, remanufacturing). However, real-world problems require considering additional qualitative factors such as quality, environmental considerations, among others that are difficult to measure. Decision theory provides different techniques to design decision framework model that include quantitative and qualitative factors. This paper presents a novelty application of the Simple Multi-Attribute Rating Technique (SMART) to optimize the decision-making process in a Close-Loop Supply Chain. A Peruvian retailing store chain data is used to validate the proposal model, and the findings provide valuable managerial insights.

Keywords
Stochastic, Network Optimization, Closed-Loop, SMART

Biography

Carlos Antonio Marino is a Professor and Researcher in CENTRUM Graduate School at the Pontificia Universidad Católica, Lima, Peru. He earned B.S. in Industrial Engineering from University of Lima, Peru, Masters in Engineering Management from California State University, Hayward, USA, Master in Transportation and Logistics Management at American Military University, West Virginia, USA and PhD in Industrial and Systems Engineering from Mississippi State University, USA. He has published journal and conference papers. Dr Marino has worked with The Coca Cola Company, Nestle, Indigo Piping Systems Company. He worked as Research Assistant in the Analytics and Optimization Laboratory in the Industrial and Systems Engineering Department at Mississippi State University. He is instructor in the Industrial Engineering and Management Systems at the University of Central Florida, USA. His research interests include stochastic optimization, simulation, and decision analysis, reliability, scheduling, manufacturing, and lean. He is member of IIE and INFORMS.