Distribution cost optimization using Big Data Analytics, Machine Learning and Computer Simulation for FMCG Sector

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Abstract

Developments in information and communication technology has made significant impact on every sector. Unfortunately, limited research exists regarding information systems for the distribution networks in Supply Chain. This study made an effort to investigate the linkage between information systems and transportation cost optimization in FMCG (Fast Moving Consumer Goods) sector. Information systems should support the management at operational and strategic level. The study focused on the operational level implementation of information system with machine learning and big data analytics. Factors, variables and constraints affecting the cost of transportation were identified from industry experts and literature. Then a case study approach applied by analyzing the distribution network data of a Sri Lankan FMCG company. A quantitative model was developed to reflect the transport cost structure and a software model was developed considering the constraints and the cost structure, to reduce the cost of transportation by big data analytics, machine learning and computer simulation. Developed model has been compared with the existing model of transportation in the FMCG manufacturer to benchmark the optimization. In proposed model, the usage of vehicles are reduced, thereby minimizing the transportation cost by increasing the consolidation possibilities, route planning and stacking models.