

Optimization Model to Enhance the Petroleum Distribution Network in Sri Lanka

W.W.N. Sachini, W.M.S.K. Weerabahu, R. Wickramarchchi
Department of Industrial Management, University of Kelaniya, Sri Lanka
wijendranavodya@gmail.com

Petroleum is one of the industries that has a massive impact on living conditions of the population. Petroleum distribution network plays an increasingly important function in delivering value to the end user. The objective of this research is to study the current petroleum distribution network in Sri Lanka, identify the inefficiencies and causing critical factors and propose an optimization model to overcome these inefficiencies. A conceptual framework has been developed based on the findings observed from critical review of literature and further data was collected from Sri Lankan petroleum industry domain experts using in-depth interviews. It has been identified that Sri Lankan petroleum distribution network is not taken in to account for the optimization. Hence, it is performed by developing a mathematical model in this research. The proposed model is validated with complex and real data extracted from research findings. VBA (Visual Basic Application) is used to gain exact mathematical optimization. It is concluded from the study that distribution network overall cost can be minimized when causing critical factors are optimized. Thus, this study depicts an optimization model, with the purpose of minimizing the cost, based on inefficiencies and causing critical factors which are specific for Sri Lankan petroleum industry.

Key words: Petroleum Distribution Network, Inefficiencies, Cost, Optimization

W.W.N. Sachini is an university undergraduate, following B.Sc (Hons) in Management & Information Technology degree programme (Specialized in Business System Engineering) in the Department of Industrial Management, Faculty of Science, University of Kelaniya, Sri Lanka. She has completed computer science degree programme in SLIIT (Sri Lanka Institute of Information Technology) in 2017. She is currently following CGMA (Chartered Global Management Accountant) and CIMA (Chartered Institute of Management Accountant). Her research interests include Simulation, Optimization, and Supply Chains.

W.M.S.K. Weerabahu is currently a fulltime lecturer in Department of Industrial Management, University of Kelaniya, Sri Lanka. She obtained her MBA in Management of Technology from University of Moratuwa in 2016. Her first degree was in Management and Information Technology, graduating with first class honors from University of Kelaniya in 2013. After finishing her first degree she worked in the industry for about four years as a SAP functional consultant for Camso GIT (PVT) Ltd, Associated Motorways (PVT) Ltd and Printcare PLC. She has gained expertise in material management, SAP workflow and Plant maintenance modules. She is also a visiting lecturer to other institutions in Sri Lanka. Her research interests include, Business Process Management, Process automation with Enterprise Resource Planning systems, Management of technology and supply chain management.

R. Wickramarchchi is a Senior lecturer at the Department of Industrial Management, University of Kelaniya, Sri Lanka. He holds BSc in Industrial Management from the University of Kelaniya and MPhil in Management studies (specialized in Information systems) from the University of Cambridge, United Kingdom. He received his PhD in distributed simulation from the Sheffield Hallam University, United Kingdom.