

OPTIMIZATION OF CONTAINER LOAD PLAN FOR MULTI DESTINATION CARGO CONSOLIDATION

A Report Submitted

By

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DECLARATION

"I hereby declare that the research work entitled "Optimization of Container Load Plan for Multi Destination Cargo Consolidation" submitted is a record of an original work done by me under the supervision of Mr. T M J A Cooray, Head of Department of Mathematics University of Moratuwa. This research work is submitted in the fulfilment of the requirements of the Master Degree in Operation Research.

The results embodied in this report have not been submitted by anybody to any other university or institute for the award of any degree or diploma."

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ABSTRACT

In today's highly competitive global marketplace the pressure on organizations is to find new ways to create and deliver value to customers. In the last two decades, logistics and supply chain management has moved to the centre stage, and has become a key determinant of business competitiveness. With new concepts of Logistics & Supply chain management, every organization in the world is trying to optimise their chain by adopting new ways and means of reducing their operational cost by eliminating waste and introducing new operational procedures.

Marks and Spencer is a customer who procures goods from many countries all over the world which involves a greater amount of transportation. It is a major component when considering total logistics & supply chain cost. In order to reduce and control the transportation cost per item, it is necessary to consolidate goods into containers which will maximize the utilization.

After a detail study, it was revealed that due to inefficient loading or stuffing methods, company had to incur additional cost. Therefore, the supply chain team has introduced a set of rules & guidance to adhere when performing consolidation operation that minimizes total cost. Further, manual planning of load building may not always lead to the optimum solution and could even be inaccurate at times.

Therefore it could be considered, as planning to be a critical role in the process. Automating the planning would help to eliminate all these concerns including time consumption of manual work which will be an indirect expense to the company. Therefore, with the use of Integer Linear Programming in Operation Research, this problem has been solved within the scope of this project.

The operational difficulties of implementing this solution and the areas for further development are also been discussed while discussing and concluding on the project scope. Further, its possibilities of customizing the model to suit similar operational models in the market are discussed.

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ABBREVIATIONS

UK	– United Kingdom
FOB Date	– Freight On Boat Date
FP	– Folded Packs
GOH	– Garments On Hangers
CFS	– Centralized Freight Station
VMI	– Vendor Managed Inventory
GP	– General Purpose
HC	– High Cube
ETD	– Expected Time of Departure
PO	– Purchase Order
CBM	– Cubic Meters
LP	– Linear Programming
ILP	– Integer Linear Programming
MILP	– Mixed Integer linear Programming
USD	– United States Dollars
LKR	– Sri Lankan Rupees