ABSTRACT

Keywords: Simulation, Logistics Terminals, Performance Improvement, Conceptual modelling.

This thesis deals with the use of simulation as a problem-solving tool to solve a few logistic system related problems. More specifically it relates to studies on transport terminals. Transport terminals are key elements in the supply chains of industrial systems. One of the problems related to use of simulation is that of the multiplicity of models needed to study different problems. There is a need for development of methodologies related to conceptual modelling which will help reduce the number of models needed. Three different logistic terminal systems Viz. a railway yard, container terminal of apart and airport terminal were selected as cases for this study. The standard methodology for simulation development consisting of system study and data collection, conceptual model design, detailed model design and development, model verification and validation, experimentation, and analysis of results, reporting of finding were carried out.

We found that models could be classified into tightly pre-scheduled, moderately pre-scheduled and unscheduled systems. Three types simulation models (called TYPE 1, TYPE 2 and TYPE 3) of various terminal operations were developed in the simulation package Extend. All models were of the type discrete-event simulation. Simulation models were successfully used to help solve strategic, tactical and operational problems related to three important logistic terminals as set in our objectives. From the point of contribution to conceptual modelling we have demonstrated that clubbing problems into operational, tactical and strategic and matching them with tightly pre-scheduled, moderately pre-scheduled and unscheduled systems is a good workable approach which reduces the number of models needed to study different terminal related problems.