UNIVERSITI TEKNOLOGI MARA

THE IMPACT OF LOGISTICS UNCERTAINTY ON SUSTAINABLE ROAD TRANSPORT OPERATIONS

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ABSTRACT

Logistic industries in Malaysia are confronted with a profusion of unexpected consequences at every stage of the process. One of the biggest challenges is in dealing with issues with its road transportation infrastructure that might jeopardise the system's efficiency. However, the impact of this uncertainties on the total supply chain management cost it can only be done when the uncertainties are identified and reconfirmed, which is in the best interests of many. The purpose of this study is to investigate the uncertainty elements that are connected with road transport operations and have a significant impact on the outcome to the Total supply chain management Cost (TC). The Methodological Triangulation Method were proposed to investigate this study. In order to find the opinion of supply chain specialists, an interview with logistics expert and then following with online questionnaire was developed. An initial response of 77 logistics practitioners was obtained, and the relative importance index (RII) was used to prioritize the significant uncertainty factors that escalate the TC. This study also determined that Cost and Sustainability Risk score for each of the cluster and figured those delays is still considered as low cost despite it tops the list of uncertainties in Malaysian road transport operations. Sustainability in road transport operation can be measured by how the transport company manages the fuel consumption for its vehicles or trucks. Fuel efficiency is one of the key points to measure the success of road transport operation. It can be achieved by controlling the right variables such as speed, weight, or volume of transported good, travelled distance and other related variables. However, all the variables are highly affected by the logistics uncertainties such road congestion, faulty vehicles, error in information and many more. In this study, a fuel namely diesel usage optimization model that consider the effect of the logistics uncertainties is proposed. A case study that involves the Malaysia logistics company that considers truck tonnage, its age, model, and travelled distance as the controlled variables while delay, wrong information and changes in demand volume (carried volume) as the constraints is adapted using a 3-month data. The model is solved using Excel Solver and shows that different models at different age are losing the fuel efficient, but the difference is not significant. At the same time, delay and wrong information have some impact on fuel efficient but controllable, meanwhile changes in demand volume largely affect the fuel efficiency by 20.4 percent for the three-month data. The sensitivity analysis for the upcoming months is also done. A case study on a local logistics company as a special three-month project is presented. The case study documented in this paper to complement and support the knowledge on how the road transport performance is measured based on Sustainable Factors. The case study is using McKinnon, (2007) sustainable factor to measure the operational efficiencies, which operation can control the modal split, the handling and customer satisfaction. Thus, the operation can optimize the time and cost for each delivery and will improve the operation efficiencies and Total supply chain management Cost (TC).

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TABLE OF CONTENTS