ABSTRACT

Logistics is the important framework or design to ensure a successful operations in Supply Chain. It ranges traffic, delivery & collecting(receiving package), import & export operations, warehouse/depots, inventory control, production and Client services.

In Logistic Sector, the Small Logistics Companies depend on customer satisfaction. They are ambitious in delivering the best service for their clients. Applied for both B2B and B2C business models. However, technology is costly and not all companies especially smaller ones are capable of purchasing the infrastructure and systems, as it is crucial for better operations. Therefore, in order to thrive in the market they have to be very creative in generating more revenues by highlighting values on custom shipping solutions.

There are numerous philosophies and sciences to help smaller companies to optimize their operations. In this thesis, the philosophy used is System Dynamics created by Professor Jay. W Forrester, an American Engineer back in 1950. System Dynamics can help businessmen especially those who work in Logistic sector make better decisions when faced with sophisticated, chaotic and unpredictable situations. Genetic Algorithm is a heuristic search known in computer science, based on Charles Darwin's Theory of evolution. It computes by depicting genetics and natural selection to generate solutions to an existing problem. In this case, the problem is VRP (Vehicle Routing Problem) that worsen Logistics Companies while operating.

VR (Vehicle Routing) is basically the overall delivery mapping for fleets (logistic vehicles). It aims to create the most efficient route by reducing distances and time mainly. So that, customers will be able to receive their items on time. The last alphabet (P) stands for Problem, often times mapping routes cannot successfully deliver all of the packages to the receivers due to unpredictable on-field situations.

This undergraduate thesis is proposed as a creative solution using a quantitative method to help small logistic businesses thrive creatively even with minimum technology infrastructure and systems. With System Dynamics as the compass, VRP as the core problem, and Genetic Algorithm written in MATLAB 2020a will help small companies to create better routes with a set of alternatives.

Keywords: Supply Chain Management, Operations Management, Logistics, Genetic Algorithm