

ABSTRAK

Penerapan sains dan teknologi terbaru pada kehidupan saat ini dapat memberikan kemudahan pada berbagai aktifitas termasuk dalam dunia industri. Keterlambatan pengiriman barang ke konsumen merupakan hal yang sangat dihindari dalam proses distribusi. Salah satu penyebab keterlambatan proses pengiriman barang ke konsumen adalah pemilihan rute kendaraan yang kurang tepat. Penentuan rute kendaraan terbaik atau rute optimasi proses distribusi pengiriman barang dari gudang *distributor center* ke gudang *customer* dapat ditentukan menggunakan pendekatan *mixed integer linear programming* dengan dibantu *software lingo*. Optimasi sistem *supply chain management* dapat dilakukan dengan melakukan beberapa analisis selama satu bulan. Hasil penelitian ini menunjukkan bahwa rute optimasi dapat mengurangi total jarak tempuh, kebutuhan armada kendaraan dan biaya yang dikeluarkan oleh perusahaan. Analisis penentuan rute optimasi dan perhitungan jarak tempuh menghasilkan rute optimasi distribusi pengiriman barang yang dapat menghasilkan efisiensi jarak tempuh sebanyak 20.165,7 kilometer atau 43% dibandingkan rute sebelumnya. Analisis kebutuhan armada kendaraan dapat menghasilkan efisiensi sebanyak 181 truk atau 60,3%. Analisis biaya kebutuhan *driver* pengiriman barang dapat menghasilkan efisiensi biaya sebanyak Rp 43.366.187 atau 60,3%. Analisis biaya armada kendaraan pengiriman barang dapat menghasilkan efisiensi biaya sebanyak Rp 80.489.500 atau 21,17% dibandingkan dengan kondisi sebelumnya selama satu bulan.

Kata Kunci: logistik, MILP, rute optimasi, *software lingo*, *supply chain management*, *vehicle routing problem*.

KARAWANG

ABSTRACT

Nowadays, the implementation of the latest science and technology in life can provide convenience in various activities, including in the industrial world. Delay in the customer delivery of goods is something to be avoided in the distribution process. One of the causes of delays in the process of the delivery process is the selection of inappropriate vehicle routes. Determining the best vehicle route or optimizing the distribution process for shipping goods from the distributor centre warehouse to the customer warehouse can be determined using a mixed-integer linear programming approach with the help of lingo software. Optimization of the supply chain management system can be done by conducting several analyzes for one month. The results of this study indicate that route optimization can reduce the total mileage, vehicle fleet requirements, and costs incurred by the company. The analysis of determining the optimization route and calculating the mileage resulted in an optimization route for the distribution of goods delivery which could produce a mileage efficiency of 20.165,7 kilometres or 43% compared to the previous route. Analysis of the needs of the vehicle fleet can produce efficiency of 181 trucks, it is about 60,3%. The cost analysis of the needs of the delivery driver can produce a cost efficiency of IDR 43.366.187 or 60,3%. The cost analysis of the fleet of freight vehicles can result in a cost efficiency of IDR 80,489,500 or 21.17% compared to the previous condition for one month.

Keyword: lingo software, logistics, MILP, route optimization, supply chain management, vehicle routing problem.

