

Perancangan model optimasi untuk mengurangi biaya outbound logistik pada industri e-Commerce di Indonesia menggunakan metode Mixed Integer Linear Programming (MILP) = Designing an optimization model to reduce outbound logistics costs in the e-Commerce industry in Indonesia using the Mixed Integer Linear Programming Method (MILP)

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Abstrak

Indonesia merupakan pengguna internet ketiga terbesar di Asia dan industri jasa online atau E-Commerce di Indonesia semakin bertumbuh setiap tahunnya. Tren peningkatan market pada industri jasa online menyebabkan meningkatnya volume barang yang harus dikirim ke pelanggan. Seiring meningkatnya volume pengiriman barang, maka dibutuhkan pula aktivitas logistik yang besar. Namun, dengan biaya logistik yang tinggi terdapat perbedaan biaya antara target dengan keadaan aktual perusahaan disebabkan karena perencanaan pengiriman belum optimal. Oleh karena itu, diperlukan perencanaan aktivitas outbound logistik yang mengatur pergerakan barang dari warehouse hingga sampai ke pelanggan. Penelitian ini mengembangkan model matematis untuk mengurangi biaya outbound logistik dengan metode Mixed Integer Linear Programming (MILP) menggunakan software LINGO 18.0. Biaya outbound logistik tersebut mencakup biaya pengiriman dan biaya penyimpanan. Penelitian selama 8 periode ini mendapatkan hasil dimana biaya outbound logistik berhasil menurun dari Rp80.335.28,55 menjadi Rp49.487.340,93 dengan selisih penurunan total biaya outbound logistik tersebut sebesar Rp30.847.877,62. Keberhasilan penurunan total biaya outbound logistik juga menghasilkan peningkatan utilitas pemakaian kendaraan dari 58% menjadi 88% dan penurunan jumlah pemakaian kendaraan dari 233 kendaraan menjadi 158 kendaraan.

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Indonesia is the third largest internet user in Asia and the online service industry or E-Commerce in Indonesia is growing every year. The increasing market trend in the online service industry is increasing the volume of goods that must be sent to customers. As the volume of freight shipments increases, costs for large logistical activities are also needed. However, with high logistics costs and there are differences in costs between the target and the actual situation due to delivery planning based on the shipping service provider is not optimal. Therefore, it is important to planning outbound logistics activities that regulate the movement of goods from the warehouse to the customer. This research develops a mathematical model to minimize outbound logistical costs with the Mixed Integer Linear Programming (MILP) method. Outbound logistics costs include shipping and storage costs. Research for 8 periods found that logistical outbound costs had decreased from Rp80,335,28.55 to Rp49,487,340.93 with the difference in the total logistical outbound costs is Rp30,847,877.62. The successful reduction in total outbound logistics costs also resulted in an increase in utility vehicle usage from 58% to 88% and a decrease in the number of vehicle use from 233 vehicles to 158 vehicles.</i>