OPTIMALISASI UTILITAS ARMADA PADA RUTE DISTRIBUSI PRODUK ELANA *MINERAL WATER* DI PT KRANGGAN TIRTA LESTARI DENGAN METODE *SAVING MATRIX* DAN *BRUTE FORCE ALGORITHM*

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ABSTRAK

Penelitian ini bertujuan untuk mengoptimalisasikan utilitas armada pada rute distibusi produk Elana *Mineral Water* di PT Kranggan Tirta Lestari. Optimalisasi utilitas armada dilakukan dengan pendekatan *Capacitated Vehicle Routing Problem* (CVRP) dengan penerapan metode *Saving Matrix* dan *Brute Force Algorithm*. Hasil dari penelitian ini menunjukkan bahwa penerapan metode berhasil dalam mempersingkat total jarak yang ditempuh oleh seluruh armada dalam satu hari pengiriman dengan kondisi awal adalah 1867 km/hari menjadi 836,4 km/hari. Selain itu, total waktu yang ditempuh oleh seluruh armada pun mengalami penurunan dengan kondisi awal adalah 33,95 jam/hari menjadi 15,21 jam/hari. Dengan kata lain, total jarak dan waktu mengalami penghematan sebesar 55,21%. Hal ini pun berdampak terhadap Biaya Distribusi yang mengalami penghematan sebesar 42,41% dengan kondisi awal adal Rp4.542.493 menjadi Rp2.615.910 dan berdampak terhadap peningkatan rata-rata utilitas armada dengan kondisi awal adalah 53,31% menjadi 87,94%. Penelitian ini merekomendasikan penerapan metode *Brute Force Algorithm* sebagai strategi distribusi yang optimal bagi utilitas armada di PT Kranggan Tirta Lestari

Kata Kunci: *Capacitated Vehicle Routing Problem,* Utilitas Armada*, Saving Matrix, Brute Force Algorithm*

OPTIMIZATION OF FLEET UTILIZATION ON THE DISTRIBUTION ROUTE OF ELANA MINERAL WATER PRODUCTS AT PT KRANGGAN TIRTA LESTARI USING THE SAVING MATRIX METHOD AND BRUTE FORCE ALGORITHM

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ABSTRACT

The objective of this study is to optimize fleet utilities on the distribution route of Elana Mineral Water products at PT Kranggan Tirta Lestari. The optimization of fleet utility is achieved through the implementation of the Capacitated Vehicle Routing Problem (CVRP) approach, which involves the application of the Saving Matrix and Brute Force Algorithm methods. The findings of this study demonstrated that the implementation of the method was effective in reducing the total distance traversed by the entire fleet in a single delivery day. The initial condition, which was 1,867 km/day, was successfully decreased to 836.4 km/day. Furthermore, the total time traveled by the entire fleet decreased from an initial condition of 33.95 hours per day to 15.21 hours per day. In summary, the total distance and time have been reduced by 55.21%. This also had an impact on distribution costs, which experienced a 42.41% reduction, from an initial condition of Rp4,542,493 to Rp2,615,910. Furthermore, it had an impact on increasing the average fleet utility, which increased from an initial condition of 53.31% to 87.94%. This study proposes the implementation of the Brute Force Algorithm method as a distribution strategy for fleet utility at PT Kranggan Tirta Lestari.

***Keywords**: Capacitated Vehicle Routing Problem, Fleet Utility, Saving Matrix, Brute Force Algorithm*