

ABSTRACT

Fiber to the Home (FTTH) as the promised Technology for the Broadband and Optical Era now applied widely all around the world, especially in the Modern Country. Indonesia as Developing Country having the highest potential demand for Triple Play Services, The Wide Scatter of Demand become the most barrier of Investment, High cost of Investment. Deployment Infrastructure optic (FTTH) at Telkom design by man and manual process base on experience and capability designer. This manual division process is time consuming and non-optimized which very often leads to a high design cost.

Ant Colony Algorithm (ACA) is a relatively recent heuristic search method whose mechanics are inspired by the swarming or collaborative behavior of biological populations. ACA is similar to the Genetic Algorithm (GA) in the sense that these two evolutionary heuristics are population-based search methods. In other words, ACA and the GA move from a set of points (population) to another set of points in a single iteration with likely improvement using a combination of deterministic and probabilistic rules. The GA and its many versions have been popular in academia and the industry mainly because of its intuitiveness, ease of implementation, and the ability to effectively solve highly nonlinear, mixed integer optimization problems that are typical of complex engineering systems. The drawback of the GA is its expensive computational cost. This paper attempts to examine the claim that ACA has the same effectiveness (finding the true global optimal solution) as the GA but with significantly better computational efficiency (less function evaluations) by implementing statistical analysis and formal hypothesis testing. The performance comparison of the GA and ACA is implemented using a set of FTTH design.”

This paper proposes a comparative analysis Genetic and Ant Colony Algorithm method to optimize routes of distributions from Optical Distribution Cabinet (odc) to optical distribution points (odp) satisfying given constraints. Each sub-area is served by one optical distribution cabinet (odc) containing the optical splitters and maximum capable handle 12 to 24 of distribution cable with full capacity of 144 or 288 cores ODP. In this paper, we focus on how Genetic Algorithm and Ant Colony Algorithm Optimization method can be employed to solve this problem effectively.

The outcome from this study optimization path route placement of odp compared to the implemented project, optimization using GA or ACA process give the same result 1,91% for 3 and 5 odp, but for more than 9 odp give different result, ACA give result shorter distribution cable length (lowest distribution attenuation) rather than GA with positive increasing: 3% for 9 odp, 4% for 24 odp, 14% for 74 odp and 23% for 144 odp, Differential between optimization using ACA and GA nearly exponential.

Key word : FTTH, Genetic Algoritm, Optimizing, TSP, Ant Colony Algorithm