ABSTRACT

PT. XYZ is the largest independent transportation equipment manufacturing company in Indonesia. In April 2020 PT. XYZ received orders in the form of 78 45ft skeletal trailers with six units of delivery per batch. The company does not have a sequencing job in the component manufacturing area because of this there is a delay in delivery. There are 9 alternative machines, and 5 types of operations to produce 146 components. In the job shop system scheduling problem experienced by PT. XYZ belongs to the category of flexible job shop scheduling problem (FJSSP) where there are several alternative machines to perform one type of production operation. FJSSP is a complex problem that requires an algorithm that has a high level of complexity. Currently, the methods used to solve FJSSP are Tabu search (TS), Simulated Annealing (SA), Ant Colony Optimization (ACO) and Genetic Algorithm (GA). Among these methods, GA has fast random search capabilities, solid foundations, and simplicity. GA is used to conduct global exploration of the resulting population. In the completion of FJSSP, the GA population consists of chromosomes. The chromosomes represent alternative allocations of machines, and the sequence of operations to be performed on those machines. With this, GA can be the optimal solution, for minimizing the makespan of the component area production process at PT. XYZ. The results of the scheduling design by implementing the GA method produce a makespan value of 7424 minutes. The proposed scheduling shows an improvement in the makespan value of 10.84% from the existing condition.

Keyword – Flexible Job Shop, Genetic Algorithm, Makespan, Penjadwalan