ABSTRACT

PT XYZ is an aircraft manufacturer that was established to facilitate in terms of maintenance of aircraft engines and industrial machinery which are owned by Indonesia. Workscopes which are conducted by PT XYZ is inspection, repair, and overhaul on aircraft engines. Based on historical data, PT XYZ has FCFS scheduling type that makes the process flow of repair at in-house department becomes longer. Based on existing capacity, PT XYZ can make the repair process into a job shop scheduling which is the type of scheduling that allows the flow of the process of becoming a parallel and shorter. Based on these circumstances, this study aims to make a improvement to machine scheduling becomes job shop scheduling using genetic algorithm to minimize makespan of existing scheduling.

The data which is used to create a job shop scheduling is routing job and operation, the amount of machines, type of machine, and processing time. The data will be used as input in genetic algorithms. Some of the parameters used in the genetic algorithm is the population size, the mutation opportunities, opportunities crossovers, and maximum generation. The first process in the algorithm is to make the population consisting of several chromosomes. Furthermore, each chromosome will be evaluated by the fitness value, will be done by selection operation, crossover operation, and mutation operation to gain higher fitness values until termination process is fulfilled.

Based on the calculation of makespan, fitness, and utilization of each machine then obtained an improvement scheduling to minimize makespan until 54,5 hours or by 64.38% of the existing condition.

Keywords: Job shop scheduling, genetic algorithm, makespan, fitness, FCFS