

ABSTRACT

The aim of research is to find and determine an optimal job sequencing in sub-assembly processes of product based on minimum total of lateness time and maximum fitness value using Genetic Algorithm. With that result, it can be achieved the final solution with the meanings of job sequencing based on both of criterias above. The Data which are used to solve this research came from Industrial Mechines and Services Division of Air Brake System Departement PT. Pindad (Persero) and observation data. They are the data of product assembly components and sub-assembly description, processing time, due date, and lateness time.

Looking for solution space is started by determining some of Genetic Algorithm parameters. They are population size, maximum generation, cross over probability and mutation probability. Then the searching process is began by finding all possible solution space with chromosome generating randomly that is limited by population size that finally will be used as parameter of the best chromosome selection. Then, the process can be continued by doing individu evaluation to find fitness value of each chromosome in population size that will be used as the aim function of Genetic Algorithm. After that, the Genetic Algorithm operations can be done. They are cross over and mutation. This process will be continued until the final condition is fullfiled. The final condition will be happened if iterasi have been done as much as maximum generation size or level convergence condition is fullfiled.

The searching result is random solution in a large solution space and it is appropriated with requiring selection criteria. They are minimum total of lateness time and maximum fitness value. Because of solution searching is done randomly, so solution is done by ten times observation based on resulting solution and graphic convergence of fitness value. The process using Genetic Algorithm produce results as solution that shows that total of lateness time at beginning is 52128 seconds. This condition can be solved for the better solution by proposing the new job sequence in sub-assembly process with total of lateness time is 43234 seconds. By reducing total of lateness time in sub-assembly process then indirectly will reduce total time of whole production processes. Using the Genetic Algorithm can be obtained the elimination of the total lateness time as much as 17,06 %.

Keywords: Job Sequencing, Genetic Algorithm, Random solution space, Sub-assembly