

ABSTRACT

PT Gradien is a company engaged in the manufacturing industry where the company produces products made of plastic, one of which is a spring guide product. In this production process, PT Gradien applies a first come first serve and make to order system. Based on PT Gradien's order history data in December, there were three jobs that tardy job and were unable to fulfill the amount of production according to customer demand. This is because the first come first serve system applied to the production process has the disadvantage of not considering makespan and average waiting time. In addition, the first come first serve method that does not pay attention to the due date of each job can cause a convoy effect. The tardy job resulted in additional shipping costs being borne by PT Gradien because they had to deliver goods more than once. Therefore, a proposed scheduling design is carried out using the Hodgson Algorithm with the aim of minimizing the number of tardy jobs, so that orders can be delivered in one delivery.

The initial step in the scheduling process using the Hodgson Algorithm is to sort the jobs based on the ordering day and the smallest due date value. Jobs that have the same ordering day and due date, then the jobs are reordered based on the smallest processing time. Next is the process of allocating each job to each machine and calculating the lateness value for each job. The allocation process produces jobs with positive lateness values which are at the end of machine 1 and machine 4. Therefore, the job allocation process is completed in one iteration.

The proposed scheduling using the Hodgson Algorithm produces 2 tardy jobs from 13 job order lists on machine 1 and machine 4 respectively with jobs that experience tardy are jobs 12 and 13. In the existing conditions, the company's scheduling produces 3 tardy jobs, namely job 9, 12, and 13. Ordering day for each different job is a drawback of Hodgson's Algorithm, where the number of tardy jobs produced does not decrease significantly. The results of reducing the number of tardy jobs will be more optimal when the ordering day of all jobs is the same.

Proposed scheduling using the Hodgson Algorithm can help companies to minimize the number of tardy jobs, so orders can be fulfilled. In addition, the reduced number

of tardy jobs can also minimize extra expenses for the cost of shipping unfulfilled products from PT Gradien in Bandung to PT Showa Mfg in the Cikarang area which is ± 120 km away.

Keywords: Scheduling, First Come First Serve, Make to Order, Tardy Job, Hodgson Algorithm