

ABSTRACT

This final project presents an optimized scheduling model for the production process at PT. XYZ. PT. XYZ, a manufacturer of motorcycle windshields, faces persistent issues of production delays due to poor scheduling, workload imbalance, and unanticipated rush orders. Particularly when two identical laser cutting machines are involved, these issues lead to considerable tardiness and decreased client satisfaction. Between September and November 2024, the company's total tardiness was 2848 hours, which shows that a more effective scheduling system is desperately needed. Designing an optimal scheduling model that reduces overall tardiness in the manufacturing process at PT. XYZ is the aim of this study. The goal is to achieve product deadlines while optimizing job sequencing and machine utilization more efficiently. The study does this by utilizing a combination of heuristic techniques, including Earliest Due Date (EDD) and Shortest Processing Time (SPT), as initial sequencing principles. The ideal timetable is then generated by implementing Mixed Integer Linear Programming (MILP). Using Microsoft Excel Solver, the MILP model is built by combining work deadlines, machine limitations, and actual production data. The overall tardiness decreased significantly from 2848 hours to 1487 hours, according to the results. The suggested methodology effectively reduced wait times, enhanced alignment with customer delivery expectations, and enhanced job distribution among machines. In summary, the use of MILP in identical parallel machine scheduling turned out to be a successful tactic for reducing tardiness and improving output.

(Keyword: Identical Parallel Scheduling, Mixed Integer Linear Programming, Minimize Total Tardiness).