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DESIGN AND DEVELOPMENT OF WEB SCHEDULING APPLICATIONS IN MANUFACTURING COMPANIES WITH THE APPLICATION OF GENETIC ALGORITHMS

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ABSTRACT

Production scheduling in manufacturing companies is one of the important components in the survival of the company. Potential errors caused by manual production scheduling can have a negative impact in the form of material, time, and financial losses. To provide a solution to this problem, a heuristic search approach is used, a search based on the rules used to find a solution. The heuristic search method used is a genetic algorithm. This research will design and develop a system that aims to overcome the problems caused by manual scheduling by implementing genetic algorithms. The parameters used in the scheduling are the crossover probability value, the mutation probability value, the maximum number of generations, and the maximum number of errors. This research was conducted with a case study of PT. XYZ, which is engaged in manufacturing packaging products from paper, still uses manual scheduling by sorting jobs with the closest due date. With 36 job operations and 10 machines, the best results were obtained, namely the total time for the completion of the work was 22 working days with the program execution time being 4.75357099983215 seconds. These results are obtained with a crossover probability parameter of 0.8, a mutation probability of 0.7, a maximum number of 500 generations, and a maximum number of errors of 10.

Keywords: *Manufacturing, Production Scheduling System, Heuristic Search, Genetic Algorithm*