Abstract

Any organizations including manufacturing units give attempts to improve operations efficiency as well as respond to customers' needs. Scheduling is a tool to improve operations efficiency and customers' responsiveness. In this research, an attempt is then given to find a means to schedule reworked units in an electronic industry. Five well-known scheduling methodologies are utilized. They are First Come First Serve (FCFS), Shortage Processing Time (SPT), Shortage Remaining Processing Time (SRT), Earliest Due Date (EDD), and Longest Processing Time (LPT). It is found that SPT and SRT gave the lowest total flow time, lowest average completion time, and highest utilization percentage but they have highest values of total late jobs and maximum lateness. EDD provides the best values of total late jobs and maximum lateness. LPT and FCFS seem to be the worst and the second worst in all performance measurements.

Based on the pros and cons of the five methodologies, three new scheduling approaches are proposed. Since the policy of the case study is given to customer on-time delivery, EDD seems to be the best. The first proposed methodology gives an attempt to minimize lateness. So, EDD is first utilized in this methodology. In case that there are jobs having the same due date, those jobs are rearranged by using total processing time before scheduling to stations in the first process. After scheduling the first process, FCFS is utilized to schedule the other processes. The second methodology orders first slack, which is the difference between due date and total processing time. If there are jobs having the same slack number, those jobs are rearranged by using total processing time before scheduling to stations in the first process. After scheduling the first process, SPT is utilized those jobs are rearrange by processing time each machine in first process. FCFS is utilized to schedule the other processes. The last methodology gives an attempt to reduce the total flow time. First, the jobs are rearranged by the processing time of the 1st process. Then FCFS are utilized to schedule the other processes. In case that there is an overdue job, the job is moved to schedule prior to the consecutive job. Until there is no overdue job or the overdue job is in the first place, the

scheduling process is done. The result shows that the last methodology gives the lowest average tardiness, total late jobs and maximum lateness whereas the first methodology gives the lowest average completion time and highest utilization percentage. Based on the emphasis of the case study policy, the last methodology is utilized and the result shows that using the last methodology would give lower average tardiness, total late jobs, and maximum lateness. A program based on the last methodology is constructed in order to make the use of the methodology easily.