Trade-Off Between Maximizing Throughput Rate And Minimizing System Time In Kanban Systems

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Summary

Investigates the trade-off between the average throughput rate and the average systems time using kanban discipline. Considers a multistage serial production line system with materials in the system controlled by kanban discipline. Presents simulation results to evaluate the production system performance in terms of the average throughput rate and the average system time for a fixed total number of kanbans over a given number of serial workstations. Constructs and compares efficient allocation sets for three and four workstations that are generated by kanban discipline for two processing time distributions, namely, uniform and exponential distributions. Based on the simulation results from three and four work-stations, develops a general design rule to maximize the average throughput rate and to minimize the average system time. Analyses five and six workstations using the general design rule. Tests the validity of the general design rule by considering five and six workstations with a different number of Kanbans. The results show that most of the efficient sets generated by the design rule are identical to those generated by enumerating all combinations of kanban allocations. However, using the general design rule reduces the simulation work tremendously.

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