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Analysis of queuing behaviour in commercial banks: a case study

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Studying queuing behaviour has become a widely explored research area at the time. The practical scenario of waiting lines must be daily experienced by almost everyone. Banking services are foremost among the places where queues are formed. Proper management of banking queues is enhanced for improving customer satisfaction. This study was undertaken with the aim of reducing customer waiting time in a preferred commercial bank of Sri Lanka. The bank had two counters, thus two queues were experienced enabling the system to behave as a multi-server queueing system with limited waiting room capacity and unlimited population size. The system was observed for two hours during two consecutive weekdays. The sample comprised 150 observations on customer arrivals to the queues, arrivals to the counters and departures from the counters. The system was modelled using the student version of Rockwell ARENA 14.5. The study assumed customer arrivals were random and independent, there was no idle time for the counters and the customers were served on first-in-first-out basis. ARENA Input Analyser recorded the probability distributions of inter-arrival rates for queue 1 and queue 2 to follow Gamma and Exponential distributions while corresponding service rates followed Weibull and Normal distributions. The model was run for a replication length of one hour. The waiting times of customers in two queues were observed to be 10.48 and 2.51 minutes. The system permitted 57 customers into the bank and 42 were served and sent out recording a performance rate of 73.68%. Higher waiting times stimulated the necessity of improving the performance of the counters. Thus the quantity of the allocated resources was reformed to conclude an optimal result. When the number of resources was changed separately, the total time spent in the system was decreasing, but several waiting times recorded higher values than the current system. Consequently, the resources of both counters were changed at once resulting no waiting time in queue 1 and 0.22 minutes in queue 2. Further, the total waiting time in the system was observed as 2.79 minutes. Moreover, the system served 54 out of 57 customers. This recorded a performance rate of 94.74% which is more feasible than the current system. Thus the study proved that the bank can eliminate excessive waiting times of customers and improve its efficiency through proper utilization of resources.

Keywords: Bank queues, Commercial bank, Input analyzer, Rockwell ARENA, Simulation