

MODELING AND SIMULATION OF A MEDICAL CENTER QUEUING SYSTEM: A CASE STUDY

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Minimizing the waiting times improves customer attraction in service organizations. It would create much profit and greater customer satisfaction. Therefore, queuing performance is an important measure for privately owned medical centres. This study selected such a medical centre forming an unnecessary queuing with patients daily. Accordingly, the main objective was to model the system and analyse its queuing behavior to provide further improvements. In this medical centre, only one doctor provided the service to the customers. The patients had to wait much time in the waiting line to meet the doctor. Just after checking, the patients went to the pharmacy in the medical centre. Thus all patients checking, prescribing and issuing medicines and payment handling were done by him. This created long waiting times for the patients. Therefore, the study identified this system as a single server queuing system with finite waiting room capacity and infinite population. The observations were done in three weekdays from 4.30 to 6.30 pm at the medical centre. The sample included 100 observations. The times relevant to patients' arrival and service receiving were recorded as primary data in the study. They were analysed using the student version of Rockwell ARENA 14.5. The assumptions were made on patients' arrivals to be random and independent. Also the service discipline was considered as First In First Out. Then the system was modelled in ARENA interface and simulated for two hours. The results showed that the service rate of the doctor was 50%. The average number in the queue at doctor checking was five patients. Further, the average waiting time of a patient in the queues at doctor checking was 41.23 minutes. The doctor spent 19.61 minutes in average for a checking of a patient and 14.54 minutes to do the remaining tasks. Therefore, the results ensured the existing problem having a single person for many purposes in this system. The time was wasted because the doctor moved to several places in the medical centre for each patient and performed several tasks. Therefore, the study thoroughly recommended to assign a pharmacist to issue the medicine and a cashier to handle payments in advanced considering the financial feasibility.

Keywords: *Medical Centre Queuing System, Simulation with ARENA, Single Server Queuing System*