



## A Report on Scope of Implementation of Queuing Model of Operation Research at Hospital with specific reference to IGIC

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**Abstract :** *The study was undertaken for one week at a hospital, Indira Gandhi Institute of Cardiology (IGIC), to observe the server utilization factor. It also provide case study of the use of several OR methods, including Markov decision process, and simulation to optimize the scheduling of patients with multiple priorities. Data was collected by observing and analysis. Patient utilization factor ( $r$ ) is 0.58. The research reveals that the inter arrival times of patients follows the exponential distribution and the service time follows normal distribution. The mean arrival rate of patients is 3.15 and the mean service rate of patients is 5.38.*

**Keywords:** *Hospital, inter-arrival time, service time, utilization factor, distributions.*

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### Introduction:

Queuing theory had its beginning in the research work of a Danish engineer named A.K. Erlang. In 1909 Erlang experimented with fluctuating demand in telephone traffic. Eight years later he published a report addressing the delays in automatic dialing equipment. At the end of World War II, Erlang's early work was extended to more general problems and to applications of waiting lines (Shyfur and Chowdhury, 2013).

A queuing system consists of the customers and servers. Waiting line or queues are in the schools, hospitals, bookstores, libraries, banks, post office, petrol pumps, theatres etc., all have queuing problems. Queues are very familiar in our daily life. Queuing theory is a branch of operation research because the results are used for making decisions about the resources needed to provide service (Shanmugasundaram and Umarani, 2015).

Queuing theory is the mathematical study of waiting lines, or queues. Queuing theory examines every component of waiting in line to be served, including the arrival process, service process, number of service channels, types of queuing discipline and number of customers. In general, a queue or waiting line is formed when the numbers