

QUEUE LINE THEORY PIZZA SIMULATION EXAMPLE

ABSTRACT

This study presents a comprehensive analysis of the queueing problem and the application of waiting line theory, which directly affect customer satisfaction and operational efficiency in the service sector. The research emphasizes the importance of delivering prompt services in a highly competitive market and examines in detail the negative impacts of queue formation—stemming from delays in meeting customer demands—on both cost and quality. In addition to discussing fundamental concepts, the study employs mathematical models using probability distributions such as Poisson, exponential, and Weibull to analyze service system parameters and customer behavior.

Focusing on both the theoretical foundations and practical applications of simulation methods, the paper details the advantages of simulation in modeling system behaviors, performing scenario analyses, and optimizing resource utilization. In the application section, a simulation model based on real data and expert opinions for the package delivery process of a globally recognized franchise pizza brand is examined. Through the model, key performance indicators such as customer waiting times, service quality, and delivery performance are measured.

The findings demonstrate that simulation techniques serve as an effective tool in optimizing business processes and enhancing strategic decision-support systems. Furthermore, the study highlights challenges encountered during data collection, model development, and scenario analysis, offering strategic recommendations for future planning.

Keywords: Queueing Problem, Simulation, Operations Research

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