

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**THE APPLICATION OF QUEUING THEORY MODEL USING
THE DSW ALGORITHM AND THE L-R METHOD TO
OPTIMIZE CUSTOMER FLOW AT PIZZA HUT**

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ABSTRACT

The queueing theory model is the quantitative observation of congestion and disruptions while waiting in line. In general, a queue forms in a production system when the number of customers (human beings or physical entities) requiring service waiting time exceeds the number of facilities available to serve them. This study aims to compare the behaviors of a queueing system at an order counter using the Fuzzy Queueing Model, which are the Dong, Shah, and Wong (DSW) Algorithm and the Left-Right (L-R) Method. One of the approximate methods that employs intervals at various α -cuts is the DSW Algorithm. In a standard interval analysis, it was the complete α -cuts intervals, while in the L-R Method, the priority discipline fuzzy queueing model is being examined and summarized in two kinds of situations, which are no priority discipline and pre-emption priority. Based on our study, the problem often occurs when the deficient customer time service during service delivery has an impact on customer flow and the time service provided to the next customer. The customer's time service during receiving the services will be affected the customer flow and the time service for the next customer. Data variables have been gathered, including service time and server queue arrival time. Results indicate that the computed performance measures of the fuzzy queueing model in the L-R Method are within the range of the performance measures of the fuzzy queueing model in the DSW Algorithm. Thus, the DSW Algorithm is the most effective way to minimize the waiting time at the service counter and optimize customer flow. For further study, a different researcher might use a different fuzzy queueing model in the system to address the same issue, such as the Fuzzy Inference System (FIS) and the Ranking Function Method (RFM).