Universiti Teknologi MARA

Optimizing Passenger Before-Boarding Time using Queuing Theory and Dijkstra Algorithm

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

The train is the best alternative public transport for Malaysians to use to avoid traffic jams. However, passengers are often delayed by the lengthy queuing time at the ticket counter during rush hours. To help reduce passenger travel time before boarding during rush hour, the current study aimed to minimize two items, namely counter service time for buying tickets and travel time from the ticket counter to the train platform. To achieve these objectives, Queuing Theory Problem and Shortest Path Problem (Dijkstra Algorithm) were applied. Based on the result, both objectives were successfully achieved. The minimum average counter service time was 0.88 minutes. Then, the shortest time from the ticket counter to the platform was 111 seconds. For both time frames, the minimum duration before buying tickets until arriving at the platform was 2.73 minutes. It is recommended that future research in this area compare between waiting time during rush hour and non-rush hour to identify the major problem that occurs during rush hour. This study can be further enhanced by expanding the use of the queuing theory to determine the number of optimal counters to operate at one time.

Keywords: Dijkstra Algorithm, Queuing Theory, rush hour, ticket counter, train station

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