

SIMULATION MODELLING FOR EVALUATING PERFORMANCE OF COMMUTER SYSTEM WITH ARENA

(Pemodelan Simulasi untuk Menilai Prestasi Sistem Komuter dengan Arena)

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ABSTRACT

Capital investment on upgrading commuter transportation system may be ineffective if demand of passengers towards commuter is not accounted for. Hence, simulation study is suggested to study the commuter system performance. The system is evaluated from the aspects of waiting time of passengers and number of cases of passengers being left out at the stations. Input data such as arrival time of commuter, arrival process of passengers, capacity of coaches, proportion of passengers to certain destinations, and dwelling time of commuter at stations were collected, modelled, validated and used as input to the simulation model developed using Arena. The developed model is used to generate data related to the performance of the system. An example on application of the model in comparing performance of two classes of commuter is discussed.

Keywords: simulation modelling; stochastic process; transportation; performance; Arena

ABSTRAK

Pelaburan modal dalam menaik taraf sistem pengangkutan komuter mungkin tidak berkesan sekiranya permintaan penumpang terhadap komuter tidak dipertimbangkan. Oleh itu, suatu kajian simulasi telah dicadangkan untuk meninjau prestasi sistem komuter. Prestasi sistem dinilai dari segi masa penumpang menunggu komuter dan bilangan kes penumpang ditinggalkan oleh komuter di stesen-stesen yang berkaitan. Data input seperti masa ketibaan komuter, proses ketibaan penumpang, kapasiti koc, perkadaran penumpang ke destinasi tertentu, dan tempoh masa komuter berhenti di stesen dikumpulkan, dimodelkan, disahkan dan digunakan sebagai input kepada model simulasi yang dibangunkan menggunakan Arena. Model simulasi yang dibina telah digunakan untuk menjana data output yang berkaitan dengan prestasi sistem tersebut. Contoh penggunaan model dalam membandingkan prestasi dua kelas komuter telah dibincangkan.

Kata kunci: pemodelan simulasi; proses stokastik; pengangkutan; prestasi; Arena

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