

Title: (s, S) stochastic inventory system in Jackson network(Article)

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Abstract

In this work, we develop and analyse an (s, S) stochastic perishable inventory system at each node into Jackson network with a service facility in which the waiting hall of first queue has infinite capacity and second queue has finite capacity for the customers. Service times are exponentially distributed. We assume that demands arrive in the system according to a Poisson process with rate $\lambda_i (> 0, A_i)$ and demands only single unit item at a time. The maximum storage capacity of the i th warehouse is fixed as S_i ; $i = 1, 2$. Whenever the inventory level reaches the reorder level $s_i (0 \leq s_i < S_i)$, an order $Q_i (= S_i - s_i)$ units is placed to bring the level to S_i . The lead-time is exponentially distributed. The items of inventory have exponential life times. The joint probability distribution of the number of customers in the system and the inventory level is obtained in the steady state case. Matrix analytical method is applied to solve for the steady state occupancy probabilities. Various system performance measures in the steady state are derived. A suitable cost function is defined and the long-run total expected cost rate is calculated. Sensitivity analysis has been carried out to study the effect of variation of parameters. Numerical examples and graphical illustrations are provided to illustrate the proposed model. Copyright © 2022 Inderscience Enterprises Ltd.

Author keywords

(s, S)-policy Jackson network performance analysis sensitivity analysis stability condition

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