World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:12, No:03, 2018

Joint Optimal Pricing and Lot-Sizing Decisions for an Advance Sales System under Stochastic Conditions

Authors : Maryam Ghoreishi, Christian Larsen

Abstract : In this paper, we investigate the effect of stochastic inputs on problem of joint optimal pricing and lot-sizing decisions where the inventory cycle is divided into advance and spot sales periods. During the advance sales period, customer can make reservations while customer with reservations can cancel their order. However, during the spot sales period customers receive the order as soon as the order is placed, but they cannot make any reservation or cancellation during that period. We assume that the inter arrival times during the advance sales and spot sales period are exponentially distributed where the arrival rate is decreasing function of price. Moreover, we assume that the number of cancelled reservations is binomially distributed. In addition, we assume that deterioration process follows an exponential distribution. We investigate two cases. First, we consider two-state case where we find the optimal price during the spot sales period and the optimal price during the advance sales period. Next, we develop a generalized case where we extend two-state case also to allow dynamic prices during the spot sales period. We apply the Markov decision theory in order to find the optimal solutions. In addition, for the generalized case, we apply the policy iteration algorithm in order to find the optimal prices, the optimal lot-size and maximum advance sales amount.

Keywords : inventory control, pricing, Markov decision theory, advance sales system
Conference Title : ICOR 2018 : International Conference on Operations Research
Conference Location : Paris, France
Conference Dates : March 15-16, 2018