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ABSTRACT

A PERIODIC REVIEW MODEL UNDER STOCHASTIC DEMAND AND STOCHASTIC OCCURRENCE OF DEFECTIVES

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In a typical production system, whether it is technologically advanced or not, manufacturing operations are often imperfect so their output may contain defective items. The presence of defective items lead to the reduction in the original optimal order quantity which would, in turn, either trigger shortages or cause the ordering of raw materials to take place more frequently. In effect, the total quantity available for sale would be less and potential customers may be lost.

Few authors have considered the simultaneous effect of demand variability and occurrence of



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defectives in a single period model. Further, all available literature on single period models are unconstrained.

This study formulated a TWO-PERIOD OPTIMAL PRODUCTION PLAN which considers the simultaneous effect of stochastic demand and stochastic occurrence of defectives. Moreover, the inventory model that was developed includes a capacity constraint.

This study includes set-up cost, production cost, salvage value, holding cost and backorder cost in the objective function. Convexity of the model was tested using the Unconstrained Optimization Technique and the Liebnitz' Rule. A numerical example was presented using the derived model. Both the demand pattern and the occurrence of defectives were assumed to be uniformly distributed. The Jacobian Transformation and Convolution Method were used to determine the density function of the product and sum of two uniform distributions, respectively.



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The study stated several assumptions in the development of the model and in reality, the model may fall short of real-world application. Hence, some of these assumptions has to be relaxed in order to come up with real-world applications.

