Application of Reinforcement Learning on Production Decision with Lead Time Dependent Demand

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ABSTRACT

Nowadays, in this era the direct sales from manufacturer to the customer is a common thing, so it will not need to get through by retailer. In the direct sales channel, manufacturers sell products directly to customers through the internet, their owned stores or mail order to reduce the distribution cost. As the increasing the demand, the lead time is longer too, make some customers cancel the demand. It makes the manufacturers facing stochastic environment that they need to decide the right amount to produce. In this research we purpose using reinforcement learning approach to decide the production per period. There are several factors to see the performance of reinforcement learning that the price, standard deviation, lead time dependent demand factor, production cost, backorder cost, and inventory cost. The result shows that using the reinforcement learning succeed to reduce the backorder by 17% and gain more profit by 2.62%. it concludes that whatever the design of different instances settings, there are still improvement on the profit and the inventory level.