

Littlefield executive summary



Production Planning and Inventory Control CTPT 310 Littlefield Simulation
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Devenne: 260339080 Miyaoka Scenario, Re: LittlefieldTechnologySimulation
Game: Inventory Management Executive Summary At the onset of the game,
we determined there were a few key things that had to be addressed to
succeed. The first was to avoid stock outs which had already occurred in the
first 50 days. We quickly moved to avoid stock outs by raising the order
point.

We did this without formal calculations at first to ensure we did not suffer
anymore stock outs while we did the analyses. Upon further analysis, we
determined the average demand to date to have been 12.3 orders per day.
We forecast demand to stay relatively stable throughout the game based on
the information provided. The standard deviation for the period was 3.64
and the safety factor we decided to use was 3.0 (98.86% certainty). Based
on the consistent lead time of 4 days, we needed $4 \times 12.3 = 49$ kits plus safety stock
of $2 \times 3.64 \times 3 = 22.72$ which gave us our order point of 71 kits. Immediately
after determining this, we moved to the EOQ: $EOQ = \sqrt{\frac{2 \times 3216 \times 1000}{1 \times 600}}$

This equation gave us our final order quantity of 327, although based on
slight demand fluctuations we had been at 321 prior to that. Our next move
was to determine what machines need to be purchased and how many. Our
strategy was to get lead times down below .5 days and offer customers that
lead time to maximize revenue. The difference between remaining at
\$750/order vs. \$1250/order could have been as high as 1. million dollars
over the life of the game (218 days) therefore the cost of new machines was
small compared to the benefit and the overall revenue potential made it

imperative to get to the lowest lead times possible. Because all stations were at times operating at full, we knew that all would create a bottleneck if left to operate as is. We could also see based on the order intake on a given day as compared to their operating ratio for the various stations, that a single machine added to each may be sufficient.

We immediately decided to purchase machines for all stations believing this may be sufficient to drop lead times to our target. Shortly after purchasing these machines, we changed to contract #2, and after more monitoring we were able to fairly quickly change to contract #3 without any further machine purchases. We monitored lead times and revenues constantly, but at no time felt that the purchase of additional machines was necessary. We believe that our speed at getting these decisions made, and the changes put in place, was crucial to our eventual success.

We did see large drops in cash when inventory was purchased but believed that we had done the correct calculations and that we were best to stay the course. We did exactly that until shortly before the time we were to lose control of the factory. We looked at several different strategies to ensure stock was available throughout the last 50 days of the game and that we got caught with minimal inventory at the end of the game. The original plan was to order sufficient inventory and safety stock and carry it through, but upon changing our order point, we quickly realized that we had inadvertently order 350 kits immediately.

This forced us to change the strategy slightly, we lowered the order point to almost lead times based on the consistency of the demand and safety stock, and calculated the units we would require, plus enough to ensure that we did

not order kits immediately prior to the shutdown. If this plan had worked perfectly, we would have ended up with 51 kits in stock, but that would have required that the demand during the last 50 days be higher than the average. This could have happened based on standard deviation, but as it turns out the daily average demand for the period was exactly 12.

We ended up with 182 kits remaining, obviously more than we had hoped, but we did not get caught with an outstanding order, or a huge number of units. In conclusion we ended the game in first place and therefore would change very little about how we played the game. We would have been able to reduce the inventory on hand at the end of the game, but the fundamental strategy of getting lead times below .5 days and maximizing revenue, and our willingness to trust that the calculations made would lead to maximum revenue despite times when we dropped from first, allowed us to win this game.