Eye Wear Manufacturer Improves Order Processing Throughput While Reducing OT

Manufacturing

Success Story

Eye Wear Manufacturing

ProModel

CHALLENGES

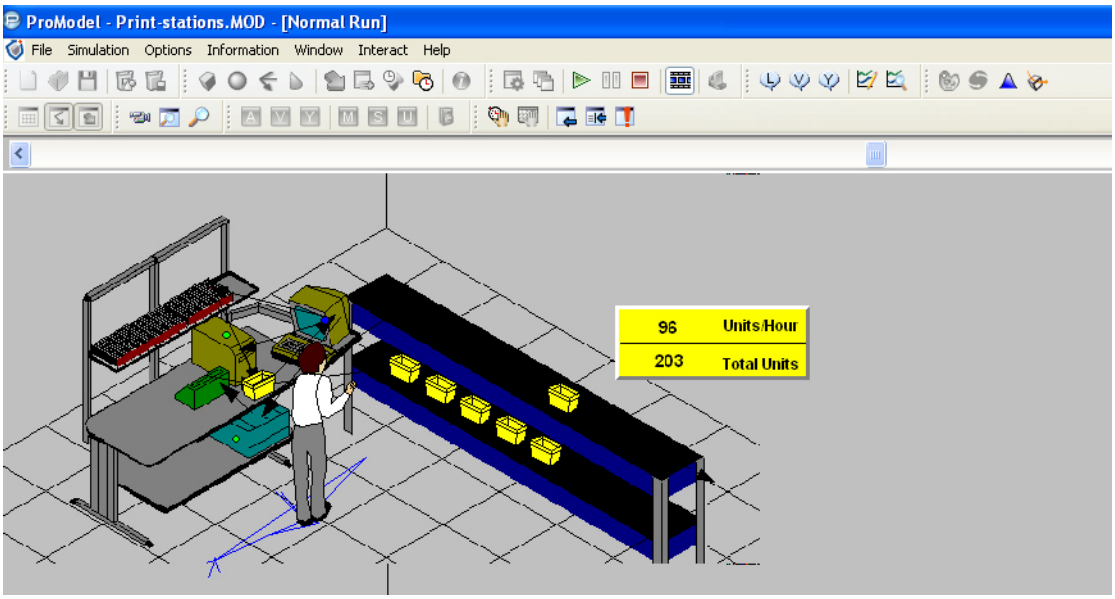
A leading maker of eye wear and related products and one of the oldest continually operating companies in the US today was experiencing order processing challenges at one of its distribution centers. They were only able to process 70 to 90 percent of all daily orders during normal shifts. The layout of the facility was inefficient in meeting the total demand of orders, and as a result, they had to run overtime and weekend shifts to meet the demand. Managers also tried to increase staff in different areas of the facility, but were still unable to meet their requirements or affect the system throughput.

The company needed to identify and correct the constraints causing the delays while keeping costs to a minimum. ProModel was engaged to develop a simulation solution which would help them determine the root cause of the distribution center's inability to meet customer demand.

OBJECTIVES

ProModel and the client developed a re-usable simulation model to help them:

- Identify system constraints
- Determine the most effective changes to increase throughput
- Improve operations with minimal or no cost increases



Printer Station Model

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SOLUTION

The solution consisted of three separate but related models. The first model (dist-before) showed a CAD layout of the facility. With the first runs of the model, it was determined that the conveyor system was the bottleneck. This explained why it didn't matter how many operators were added. Shift supervisors validated that this was what they had experienced during daily operations.

To resolve the problem a change was made to the way the totes were introduced to the conveyor system. Instead of introducing all of the totes at the beginning of the line upstream from the carousels, they would introduce the totes just upstream from the first pick area on the conveyor. This resulted in two new tote introduction areas. This was tested in the simulation model and the predicted increase in capacity was 10%, still not enough to meet demand.

Next managers identified areas where they thought they could increase throughput. The model showed that with the new tote introduction locations, the bottleneck was shifted from the conveyor system to the print pack area. It was determined that the best approach, would be to break the area into two separate operations: a printing/order verification area and a packing area. To help determine the best design and throughput capability of the printing stations, a second model was built. The detailed model of the printing station design (print-stations) revealed the model contained two equipment configurations that could be compared:

1. Single printer station, which would allow for one operator to work on one tote at a time.
2. Double printer station, which would allow for one operator to work on two totes at a time.

The results showed that the difference in throughput would be about two times more with the double-printer station and the utilization of the operator would be about 92% versus a maximum of 46% in the single-printer station option. The two-printer option was selected, because the increase in saved space, throughput, and operator utilization far outweighed the cost of the additional equipment.

The last step was then to redesign the conveyor layout and floor plan to allow space for the new printer stations, and to determine the maximum number of stations that would be required during operation. The third model was developed (dist-after) by modifying the original DC model to design the new facility layout. After running a number of order-scheduling scenarios, the design was refined to meet future projected demand requirements, as well as to have 30% buffer capacity.

VALUE PROVIDED

- The new layout was implemented and the actual operation results were within 5% of the model's predictions. The facility is now able to meet 100% of the current order requirements on straight time, as well as having 30% protective capacity for projected increased future demand.
- Reduced excessive overtime labor cost.
- In addition to the original system set up, the model continues to be used to help determine the staffing requirements and shift schedules for each area of the distribution center depending on the order profiles.

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