ABSTRACT

The company which we collaborated on this project is Brisa. It is one of the largest tire manufacturers in Turkey. Brisa had an opportunity for stock cost reduction with the help of stock optimization process. Moreover, their inventory levels were not balanced, for some products Brisa was forced to do pre-order, back-order or produce when it was ordered. Our aim in this project was to manage the inventory so that the inventory levels would be much more balanced so that company can meet the orders and the demand on time with less uncertainty. To address the problem, we have created an algorithm. The main steps of the algorithm are shown in Weekly Cover Schedule Algorithm Flowchart. The algorithms are implemented in Python and the results are visualized both in Python and Power BI. The most important findings in our project are the inventory and production policy for the company which can reduce costs while increasing the customer satisfaction.

PROJECT DETAILS

Calculating Weekly Cover (WC) values

The weekly cover is a cover-based policy that identifies how many weeks will be taken for the available inventory level to be used if it is reduced according to the forecasts. This policy calculates the cover time by dividing or subtracting from the available inventory level the forecasted demand for the same unit of time. In order to calculate the weekly cover values, we consider the forecasted values as the actual demand and compare them with the Beginning Inventory (BI) values. For the BI value, we also consider production, forecast, and inventories from the previous month.

Calculating the projected Capacity Utilization (CU) values

Production capacity is calculated based on the multiplication of the number of molds, the daily production rate of a tire, the net working days in the month, and a yield. After calculating the weekly covers, the capacity utilization of each product for each month is calculated by dividing the forecast by production capacity and a graph from these values is made. This approach calculates the proportion of the monthly forecast that can be covered with only the production of that month. In other words, it shows the risk to cover the forecast with production. The CU values for some products can be seen above at Figure 1.

CONCLUSION

With this project, we reach our goal which is to come up with an optimal inventory policy for each SKU which shows Brisa how much they should stock. Our approach and our work leads to a way that makes it easier to manage inventory because based on our work, now Brisa can easily determine the inventory levels for the SKUs and also they can see the BI, WC, Targeted WC and Capacity Utilization values accordingly. We have come up with an algorithm that tells whether the current inventory levels exceed or fall short of the needed inventory. The project is successfully completed and the algorithm is becoming part of Brisa’s inventory management process. The company is satisfied with our work and they will continue to use our work to manage their inventory levels.

REFERENCES

- Silver, E.A. et al., 1998. Inventory management and Production Planning and Scheduling, Wiley.