

COMPLEX PRODUCTION SCHEDULING DUE TO MULTIPLE PRODUCT COMBINATIONS PER MACHINE.

BACKGROUND

Jumbo Brands produces multiple products on 13 production lines for the food industry. They currently decided that they need to move to a Make-to-stock production format. During this decision, the company also realized that they need at least two weeks worth of safety stock to obtain this goal.

PROBLEM STATEMENT

To aid Jumbo to maintain 2 weeks worth of safety stock for all their products.

INDUSTRIAL ENGINEERING TECHNIQUES

Cause and effect analysis (fishbone Diagram)

A fishbone diagram was used to identify possible problem areas with changing to a Make-to-stock system. It became clear that the biggest area for improvement is the production scheduling.

5 Whys

The five whys was used to help make the problem area smaller and more specific. During this analysis it was established which data will be used and the scope thereof.

Data Observations

The data obtained from the **5 Whys** made it evident that only the bottling line are being underutilized. This was evident through most of the back orders being bottled products. This meant that the focus of this project only needed to be on those 4 lines.

Literature Research

After conducting a review of the past work done it became clear that the solution to this problem will appear in Operations Research.

Operations Research

Most of the similar projects used mathematical models to create a **Production Schedule**. In this project a **Mixed Integer Linear Program** was suggested.

Model

The model was constructed with a Objective functions that minimizes Changeovers, this gives the most cost-effective way to achieve your production goal.

Model Alternatives

The model also has an alternative where you just switch out the objective function. With an objective function that maximizes makespan, this will achieve the production goals with additional manufacturing taking place. Thus, this utilizes the facility the best but gives you a bunch of extra stock.

Production scheduling

Production scheduling looks at arranging production times and sizes to schedule which is then implemented by the factory.

METHODOLOGY

During the following project the methodology purposed by Manson(2016) for operations operations reaserch projects is used.

- Awareness of the Problem
- Suggested solution
- Development of a solution
- Evaluation
- Conclusion

SENSITIVITY ANALYSIS

There are three purposed analysis techniques to check the validtiy . To increase the demand of the products, To increase production times and takeaway one machine. During these scenarios we will be able to evaluate how robust the model is.

CONCLUSION

Not one of the two relevant models where able to run so the aim is more based on future work. Further work should be put into how time assignment takes place within the model.

AUTHORS

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