Abstract: Improving the production efficiency by exploring ways to decrease the inventory levels utilizing data gathered and analyzed about the customers, products, and processes.

Objectives

• Improving workflow with suggested layout
• Determining forecasts for customers’ order quantities
• Determining the factors that affect the delivery performance
• Improving production planning processes

Motivation and Project Information

Federal Döküm supply their services to twenty two companies around the globe, producing over 150 unique parts. Diversification of their services is a priority for the company.

The production process consists of eight independent jobs. The flow is extremely varied from product to product. The pace of the production is dictated by the equipment or the operator based on the job. The production flows in a functional layout however not an efficient one.

Casting, sanding and vibration operations take 64% of total operation time. These operations are the ones that adds the most value to the products. Additionally these operations are the possible source of any bottleneck that can occur throughout the production.

The company works with high amounts of inventory due to the unpredictable nature of the orders. The company is forced to predict and stock products. They do not have a sophisticated tool and use intuition and occupational experience.

Forecasting

We used different forecasting tools to predict the order amount of each different product, for the following year. The results are going to be used as reference points when they are trying to predict the orders and try stock up.

The aim of this analysis is to observe what delivery performance varies on. Based on the regression analysis made, the factors affecting the delivery are: order quantity, production time, total number of waybills, year-order, firm, month due date, order quantity + month due date, production time + year-order.

A seasonality relation is apparent when we are looking at the late deliveries, there is an increase in the amount of late deliveries in the closing quarters. This occurrence and the overall high rate of tardiness is by a product of inability to have an accurate forecast.

The current layout was not optimal and there were no distinguished way that the process flows. We decided to install different workshops in a line that follows the process, with changing the positions of casting machines, the opened space is enough to have a storing area for bottlenecks between stations.

Company needs to decide

• Melting the inventories
• Selling the products under the listed price.

The aim of this analysis was to find the most efficient solution for the inventory on hand. Considering the higher chance of selling the inventory of the recent years, the inventory on hand was divided into 2 categories which are: Year 2018 and 2019. Year 2015, 2016 and 2017. Our analysis based on the current selling prices and neglected the energy cost. Results and suggestions to company: For 2015&2016&2017: Selling the products with max reduction T/64 in overall product selling prices.

For 2018&2019: Selling the products will be more profitable however there is around %5 of difference.

Sources