PLANNING AND PRODUCTION PROCESSES AT FEDERAL DÖKÜM

FACULTY OF ENGINEERING AND NATURAL SCIENCES

FEDERAL DÖKÜM SANAYİ VE TİCARET LTD. ŞTİ

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The Company Information

Name	**FEDERAL DÖKÜM SANAYİ VE TİCARET LTD. ŞTİ**
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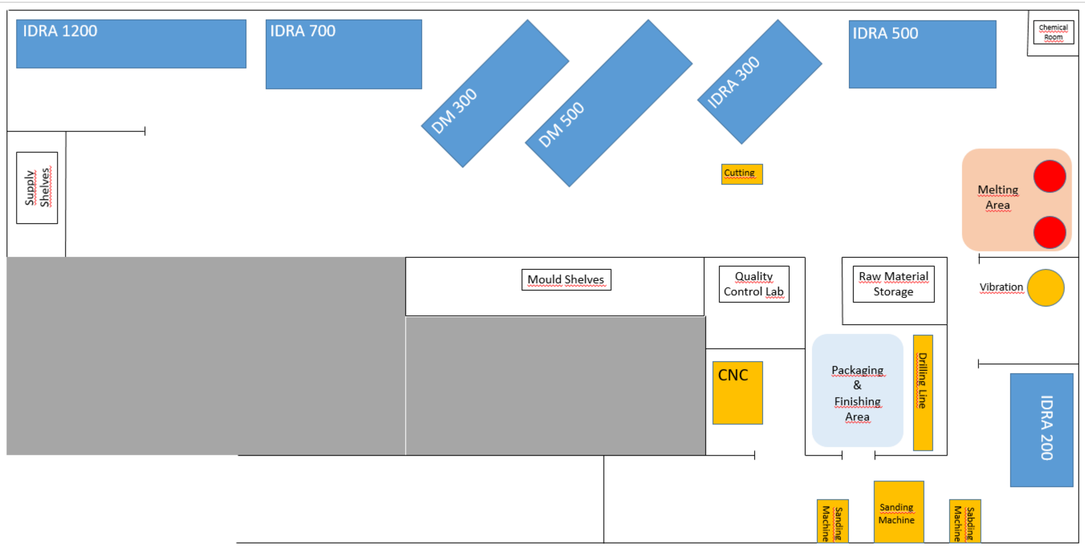
Federal Döküm operates in aluminum industry, producing their products using high pressure die casting technologies. Production depends on individual orders from the clients; as a result, the company aims to achieve %100 customer satisfaction so that they can maintain the business of the customer.

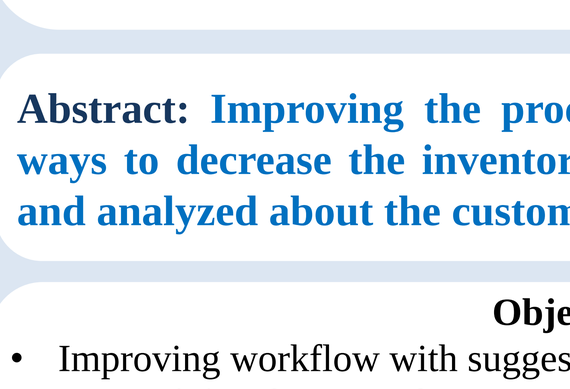


Abstract: **Improving the production efficiency by exploring ways to decrease the inventory levels utilizing data gathered and analyzed about the customers, products and processes.**

Objectives

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

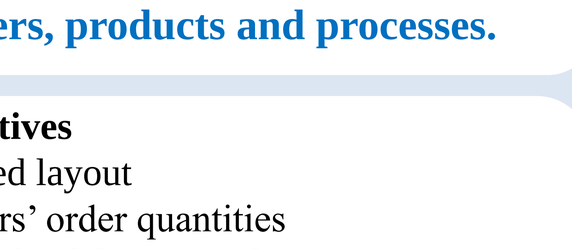
Motivation and Project Information

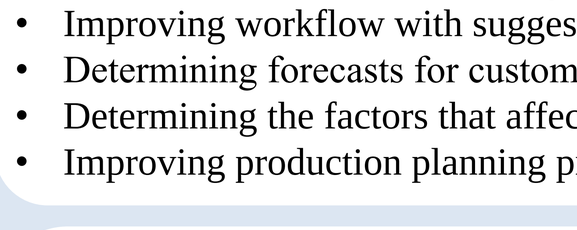


Federal Döküm supply their services to twenty two companies around the globe, producing over 150 unique parts. Diversification of their services is a priority for the company.

The business of eight companies and 38 unique products make %80 percent of the company's yearly endorsement.

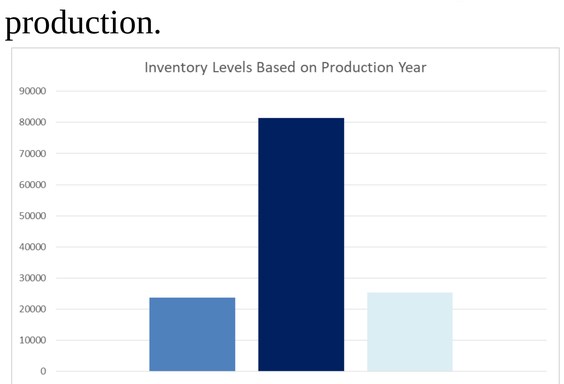
The production process consists of eight independent jobs. The flow is extremely varied from product to product. The pace of the production is dictated by the equipment or the operator based on the job. The production flows in a functional layout however not an efficient one.





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.



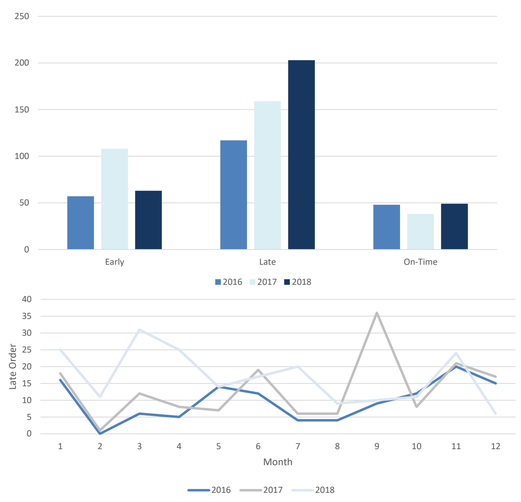
Forecasting

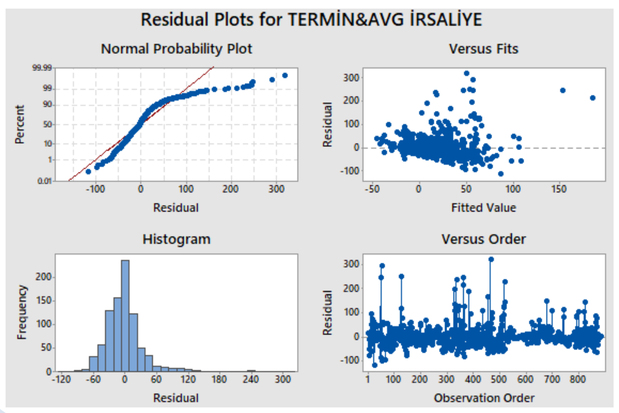
We used different forecasting tools to predict the order amount of each different product, for the following year. The results are going to be used as reference points when they are trying to predict the orders and try stock up.

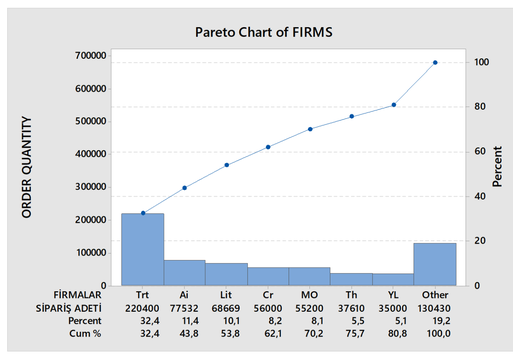
Delivery Performance

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, firms, 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 a by-product of inability to have an accurate forecast.





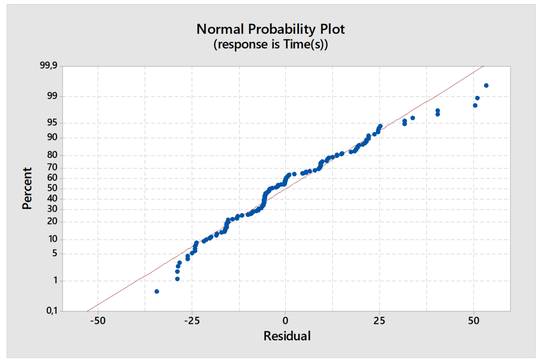


Suggested Layout & Cycle Time

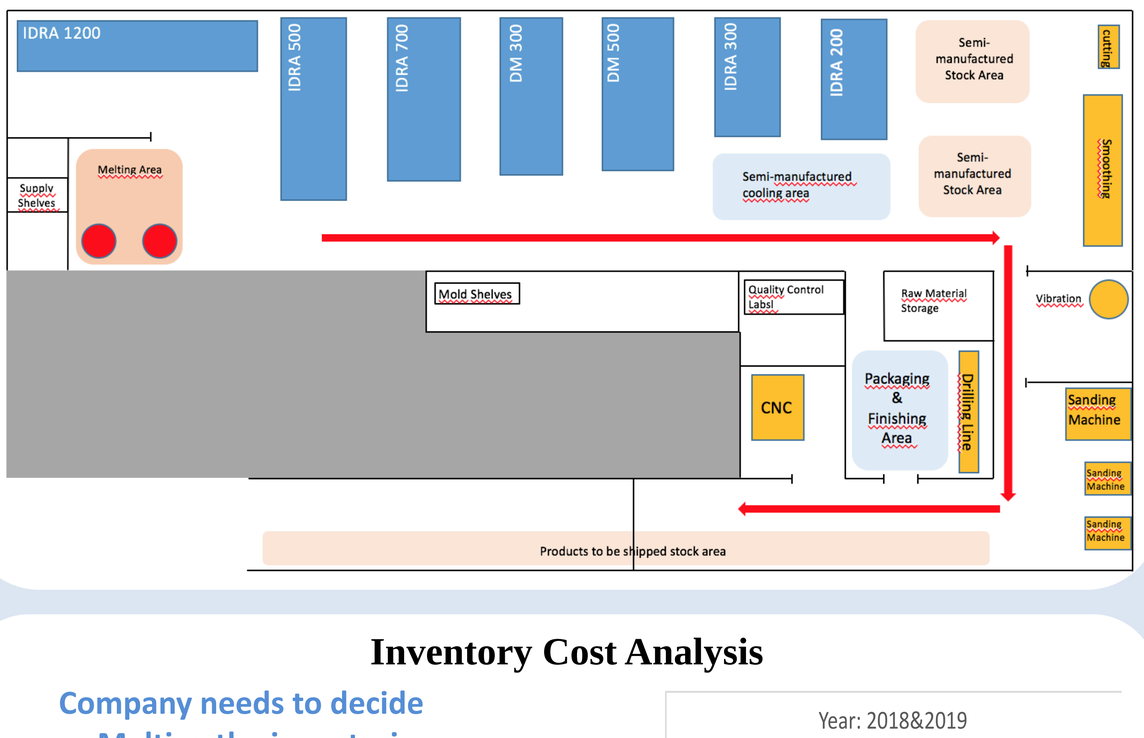
For calculating production volume for the layout we needed to know the operation times for the machines. We recorded sample data by hand and then conducted a linear regression analysis to being able to generate a formula to predict the production time of the parts.

Regression Equation

Machine			
200	Time(s)	=	65,43 + 2,88 Weight
300	Time(s)	=	83,48 + 2,88 Weight
500	Time(s)	=	87,43 + 2,88 Weight
700	Time(s)	=	99,98 + 2,88 Weight



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.



Inventory Cost Analysis

Company needs to decide

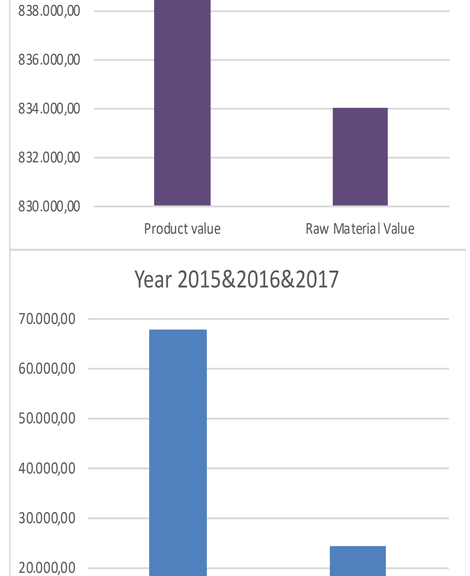
- **Melting the inventories**
- **Selling the products under the listed price.**

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 %64 in overall product selling prices.

For 2018&2019: Selling the products will be more profitable however there is around %0.78 difference.



	Product value	Raw Material Value	Difference
Year 2015&2016&2017	67.790,88	24.322,22	43.468,66
Year: 2018&2019	840.600,76	834.029,28	6.571,48

Sources

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