

THESIS PROPOSAL: DEMAND FORECASTING SYSTEM FOR SUPPLY CHAIN ANALYTICS

COMPANY

Founded in 1925, Acciaierie Valbruna is a leader in the production of Stainless Steels and Nickel Alloys Long Products used in a wide range of markets and applications, including aerospace, automotive, naval, chemical and petrochemical, construction, medical and pharmaceutical. With 4 Production Facilities, 2.600 employees and an annual output of approx. 300.000 tons of specialty steels, Acciaierie Valbruna is committed to continuous improvement in efficiency through optimization of the production cycle, investments in automation, research and development of new products.

ABSTRACT

Demand forecasting systems are typically used to improve production, distribution and sales processes as they allow for automatic estimation of the future evolution of demand. The current in-house demand tool makes use of historical data to suggest the expected monthly volumes of steel. Forecasts are updated daily and they are provided for every combination of company, warehouse, supplier, and product category.

The aim of the thesis is to improve the current system by taking benefit of advanced statistical models targeted at time series analysis. These may include ARIMA models and variations thereof, Prophet, as well as machine-learning models (such as RandomForest, GradientBoost, AdaBoost and XGBoost) and deep learning models (i.e. RNN and LSTM Networks). To further increase performance, the models can be combined via ensemble learning.

Some of the challenges include the presence of multiple hierarchical time series, ensuring that the forecasts stay within non-negative limits, dealing with outliers, and occasionally large variability.

GOALS: The candidate will implement multiple models and discuss their performances by highlighting the strengths and weaknesses of each tested solution. A thorough comparison of the outputs is required, as well as proper benchmarks against both the in-house exponential smoothing tool, and the subjective forecasts of the sales agents.

DURATION: 6 months

REQUIREMENTS: We are looking for candidates who are fluent in Italian with good interpersonal skills. Reliability, a positive work attitude, and accuracy are qualities that help define the ideal profile.

BENEFITS: Expenses reimbursement: 50€ gross/day of presence in the company during the internship period, specific safety training, lunch service and free parking available.

Company contacts

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