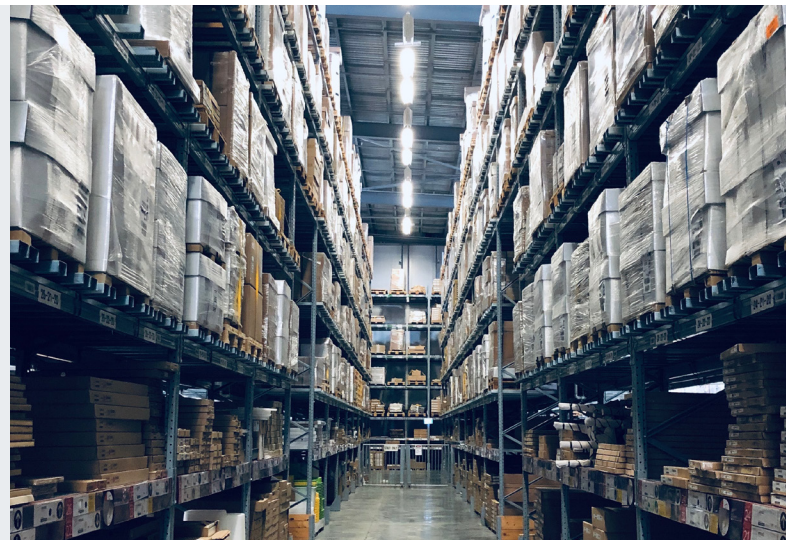


Inventory Level Optimization

The supply chain is the cornerstone of any manufacturing or retail company. It also bears the most significant costs. Defining optimal inventory levels for warehouses through safety stock requires a deep understanding of suppliers' behavior, usage and consumption of components, as well as a well-defined service level. The latter embodies the key decision of an Inventory manager: the trade-off between inventory costs and stock level.



Historically, various approaches exist for inventory planning: Forward/Weeks of Supply, Stock to Sales Ratio, Sell Through Percent, Turn, and Basic Stock. What's common amongst these rule-of-thumb approaches is the use of significant simplifications.

Completing analyses on the individual component level using detailed and accurate historical data is already a big boost. For the supply side, all historical lead times and their evolution are available. Monitoring lead times allows early identification of troublesome suppliers/parts. For predicting future consumption, the tried and proven ARIMA time series analysis method is used.

Here, a team of data scientists build and run an ARIMA time series analysis and deploy this as an Analytical Service for Inventory Managers. Automatically providing the expected supply and consumption simplifies and raises the accuracy of the Inventory Manager's job. By defining expected service levels, overstock/understock becomes clearly identifiable and in line with the agreed methodology and base data

In this case, the implementation of an Analytical Service resulted in savings of over one million euros of excess stock.

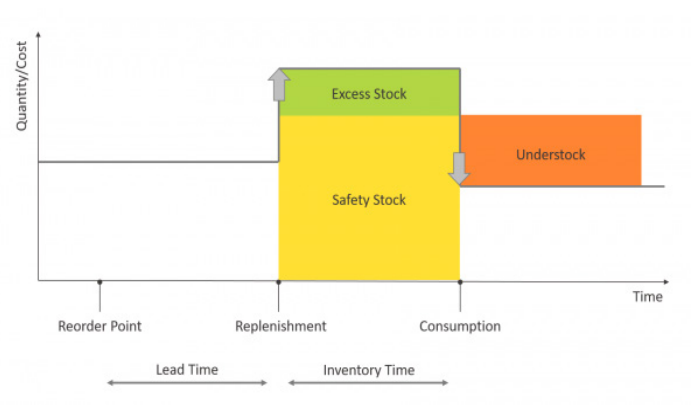


Fig. 1: Business Logic

Results:

With this Analytical Service, Inventory Managers can achieve optimal inventory levels by providing and synthesizing:

- Historic inventory usage and key metrics
- Supplier behavior
- Consumption forecasts
- Calculation of safety stock level
- Order plans (and write these back into the supply chain management system)

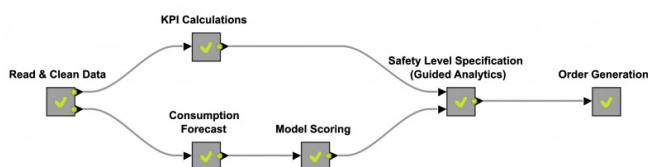


Fig. 2: High-level KNIME workflow

An ARIMA time series model created in KNIME Analytics Platform is deployed as an Analytical Service using KNIME Server. Via the KNIME WebPortal, Inventory Managers can view stock levels and write back the calculated order plan to the supply chain management system.

Try it out for yourself!

This workflow is available on the KNIME Hub:
tinyurl.com/knime-inventory-optimization

