Case Study

C6: Production planning

Mahendrawathi, E. R., et al. "Analysis of production planning in a global manufacturing company with process mining." Journal of Enterprise Information Management (2018).

# Description

Today’s highly competitive business environment forces companies to collaborate with trading partners in their supply chain to provide products and services at the right time, of the right quality, and at an acceptable cost. One of the key business processes towards succeeding in this highly volatile business environment is production planning (PP). PP is the process of ensuring that production occurs in a smooth and timely manner, satisfying a schedule made as a part of the business strategy of a company. The aim of this process is to maximise profits, fulfil demand, attract and retain customers. PP is closely linked to material procurement since the production process could not occur optimally if the material needed was unavailable.

PP provides guidelines for conducting activities including production and procurement to satisfy the demand of the end customers. A production schedule plays the important role of being a guide and evaluation baseline in the execution of the production process. It is, thus, desirable that the schedule is as stable as possible; however, the condition of the environment is rarely fully predictable. Allowing some planning flexibility should make the production system more robust to deviations in the assumptions, such as the arrival schedules of raw materials. Such flexibility would also enable the system to respond to changes in the dynamic planning process resulting from updated assumptions about the future. In practice, this flexibility is obtained by periodic planning revision, considering new information about planning assumptions and forecasts of future conditions; however, since the business environment is inherently stochastic, this often leads to a continuous re-planning, which is associated with discontinuities in ordering decisions.

Process mining can discover the real PP process and how it progresses based on the data stored in the company’s ERP database. Process mining can be used to identify the implication of constant re-planning and identify the temporal occurrence of changes to the plan.

# Assignment

Use Process Mining techniques to discover the PP and identify possible improvements.

The following questions can guide the exercise:

* How is the PP process conducted in reality?
* What are the frequency and magnitude of production plan changes?
* When these changes are temporally located?

# Dataset

A toy dataset that can be used to develop this case study PP\_logs.csv (<https://raw.githubusercontent.com/paoloceravolo/BIS2021/main/Case6/PP_logs.csv>)