



Optimizing Demand Re-Allocation under Fixed Capacity Commitments

BUSINESS PROBLEM

Offering a large option space to consumers is key to Nissan’s strategy and important to maintain customer loyalty and trust. In fact, it goes in line with Nissan’s corporate mission of “providing unique and innovative automotive products and services that deliver superior measurable values to all stakeholders” [12]. Understanding how flexibility can be approached at higher organizational level, such as sourcing strategies and upstream from the assembly side, instead of plainly at plant, is what will drive business performance and attainment of long-term goals.

DATA SOURCES

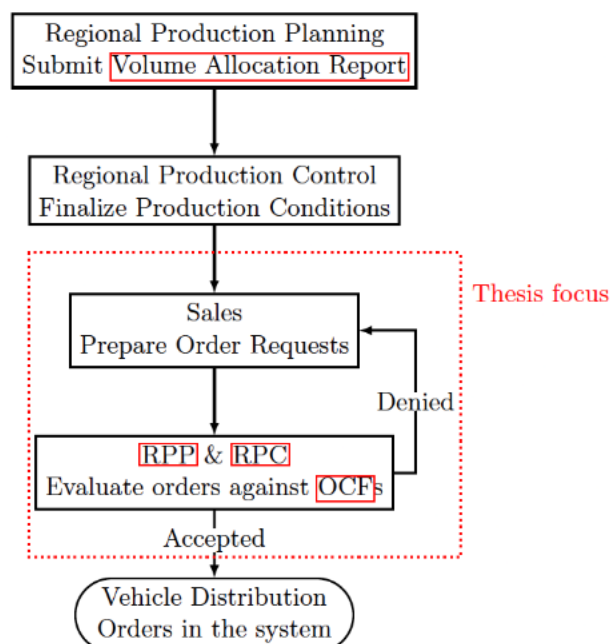
Production schedule and sales information databases (historical and forecasts), as well as costs involved in supplier counter measures for over-capacity production. Product planning and marketing long-term forecasts for supplier sourcing, with access to data used for such forecasts. Access to raw data is needed, preferably through snowflake databases, but also feasible with excel spreadsheets.

Data Types and Format

Time series (daily/monthly), snowflake database, excel spreadsheets, tableau, minitab

APPROACH

A use case of a specific vehicle model was considered and stakeholders’ interviews were conducted. Knowledge and process gaps and challenges have been identified and the demand, manufacturing and sales data analyzed over the period of a year. Then a model that optimally solves for vehicle volumes in different trim levels was proposed, approaching suppliers’ capacity commitments as constraints.



IMPACT

The model allows the company to approach supply-chain flexibility under a different lens and the results demonstrate the volume and financial improvements to current processes, with analyzed used cases showing an increased volume output of 10% and profit increases of up to 17% over a manual re-allocation process.

DRIVERS

The sourcing strategy used by OEMs in the auto industry was important to achieve the proposed solution. Different sourcing strategies could also be used to mitigate the final business problems. Working with different departments horizontally within the company also helped grasp a broader perspective on the needs of the company and how a solution could be implemented.

BARRIERS

The lack of consistent centralized information was a barrier that made it harder to produce data analysis.

ENABLERS

Working with the different departments within the SCM organization was key to achieving the proposed solution. My direct supervisor was very important in navigating the bureaucracies and helping find the important people in different areas of the company.

ACTIONS



Building a working concept tool made the organization see the value in the proposed solution. Furthermore, in order to get traction on the idea, a few use cases were presented, and knowledge was passed on to enable the future construction of a more robust tool.

INNOVATION

Using linear programming concepts to enable for demand allocation based on fixed supply constraints, but still taking into account original order targets was the main idea proposed by the model.

IMPROVEMENT

The model was able to improve volume outputs of around 10% and increased profits of 17% when compared to a manual reallocation performed to a specific vehicle model.

BEST PRACTICES

Replication should ensure that target volumes are aligned with business interests. Also, supply constraints can be adjusted according to analysts expert decisions.

OTHER APPLICATIONS

The model can be further expanded to evaluate supplier disaster cases, yearly volume increases and to be profit maximizing.