

# **Sales and Operations Planning in case of high product mix and high market uncertainty: A case study**

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**Objectives of the study:** The project behind this paper aims to support Sales and Operations Planning (S&OP) in situations where high product mix and market uncertainty make it difficult to adopt current demand management, forecasting and production planning theories and off-the-shelf tools.

**Materials and Methods:** Much has been written about demand management and S&OP and the plethora of formulas that can be used to analyse and forecast demand and plan production. Nevertheless, we found important gaps in the state of the art regarding applications in high product mix and market uncertainty contexts.

Using a longitudinal case study, we collected data on demand, forecast, MRP, products, service level, customer satisfaction, supply chain management, etc. We then used available theories to analyse forecast accuracy, demand profile, product mix, stock and production performance, etc. Finally, as is often the case with action research studies, we used a cycle of deduction and induction to propose a product grouping logic; identify a structured approach to analyse the company's performance in managing products in each group; and rank improvement opportunities.

The longitudinal case study was based at a multinational manufacturing company working with 15,000 stock keeping units and selling to 45 countries in the world, each with specific product preferences. As the company manufactures heating brassware products for the residential sector, its market is tightly linked to that of residential construction, in turmoil since the 2008 financial crisis. Demand, therefore, is highly uncertain and difficult to forecast.

**Results:** We engineered a simple S&OP process that allows for modelling and managing a complex product and market reality. Its implementation is enabled by:

A multi-criteria logic to group products based on service level, inventory management performance and forecast accuracy. This allows for identifying product groups that may require a different operations or planning strategy.

A series of guidelines to interpret risk levels and improvement opportunities. This allows for ranking the various groups in terms of their risks/reward ratio.

A simulation tool that enables users to simulate the impact that different operational choices may have on stock levels, service levels, inventory costs, etc.

**Conclusions:** The level of complexity and dynamism of today's industry and markets renders available theories for demand management and operations planning inadequate. This study contributes to knowledge as it fills a gap in the state of the art concerning management of S&OP in cases of high product mix and market uncertainty. It contributes to practice as it gives practitioners an easy to use analytical logic and tools to reduce the complexity of the analysis required to appropriately plan operations.

**Keywords:** Inventory management, operations strategy, S&OP, demand management, production planning