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Forecast-Driven Sales and Operations Planning for Balancing Supply and Demand in the Rice Industry

Industrial companies often struggle to balance supply and demand, leading to excess inventory, stockouts, and reactive decision-making. This case study examines a rice company that lacked formal demand planning and relied on siloed, unsophisticated forecasts. The main research goal was to improve decision-making, operational efficiency, and strategic alignment in the company. This was pursued by identifying deficiencies in demand planning and defining solutions to surpass them. Data were gathered from the company's database and through interviews across multiple organizational levels. Analysis of the current situation lead to implementing a Sales & Operations Planning (S&OP) process underpinned by a forecasting pipeline. The proposed S&OP process entails monthly compilation of demand and market data, forecast validation, and a mid-month meeting outputting a consensus sales plan. The forecasting pipeline begins with baseline-driven forecasts, which undergo optimal hierarchical reconciliation and weekly disaggregation using historical proportions. Demand spikes—stemming from promotions and non-Gregorian seasonality—are modeled respectively with random forests and exponential smoothing. Finally, on-hand orders are incorporated to further refine forecasts. The S&OP cycle enhances cross-functional alignment and proactive decision-making. The forecasting pipeline markedly outperforms the prior budget-based forecasts. Future work could introduce two-fold forecasting for intermittent series, production strategy optimization and portfolio rationalization.

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