

**What We Did:** A weekly dashboard for systematic forecast error measurement with actionable root causes

**The Impact We Made:** Improved forecast with less than 5% of error for 95% of stores

### Summary - Demand planning

The client had invested in purchasing and deploying an off the shelf demand planning suite. Despite the investments in the demand planning solution their SKU-store level forecasts had high error and therefore could not form a reliable basis for labor forecasting. Mu Sigma helped reduce forecast inaccuracies to less than 5% for 95% of the stores resulting in improved labor plans. The solution deployed helps identify detailed root causes for stores with high forecast errors which then enables corrective actions to be taken in the form of data set up or parameter changes in the Demand Planning solution.

### About The Client - A leading retailer

The client is a leading global general merchandise retailer with thousands of stores. The engagement was with the client's store operations team, which was responsible for planning and execution at a store level.

### The Challenge - A large network of stores

The labor planning team was unable to effectively plan for labor at a store level because of the high levels of forecast inaccuracies. This was complicated by the fact that the retailer had a network with thousands of stores across multiple countries. This kind of presence required the client to work with multiple sets of forecasts pertaining to supply chain and -finance. The client had invested in implementing a commercial off the shelf demand planning suite. However, they were still facing challenges in achieving desired levels of forecast accuracy which were required to plan labor.

### The Approach - Root cause analysis

A systematic problem solving framework was used to understand the root causes of forecast errors at an individual SKU-store level. The root causes ranged from changes in store format to incorrect parameter settings in the Demand Planning tool to not having a systematic way to measure the impact

of parameter changes being made in the tool. As the root causes were identified, the problem shifted from one large problem to multiple smaller problems. Each of the root causes were mapped to a specific solution and corrective action. This process then had to be scaled and automated so that the user effort and attention was focused on the right set of parameter settings that needed manual intervention. The team ensures that the analytical models were business-intuitive in addition to being accurate. Steps involved included:

- Improvement areas were identified through a weekly dashboard that was developed to identify stores with consistently high error
- An exploratory analysis was performed to understand the root causes of high forecast error
- After identifying stores that needed improvement, predictive models were built to fine tune forecasts and improve accuracy. The key components towards building the models included:
  - Identifying potential business drivers in collaboration with merchants
  - Statistical methods such as regression and mixed modeling, which helped in understanding the relative importance of drivers and hence forecast sales accurately
  - A tuning performance tracker to assess the effectiveness was developed on an ongoing basis to enable continuous learning

### The Outcome - Improved forecast accuracy and planner productivity

The implementation of the process helped the client to:

- Systematically identify and address stores with high forecast error magnitude and frequency
- A repeatable weekly process for forecast accuracy measurement and improvement
- Improve planner productivity by directing their attention to specific areas that needed manual interventions
- Significantly reduce the time taken to identify sister stores
- Reduce forecast error by 35% and ensure that a majority of the stores were brought under 5% error

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