



# Daily Product Demand Forecasting

For a US-based Retail Chain

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## SUMMARY

This case study highlights the solution for a US-based retail chain that required a system which provides automated product demand forecasts for individual SKUs across its stores.



## THE CASE

The retail chain operated through 100+ stores across The States, with more than 10,000 SKUs ranging over 60+ categories. These numbers spelt the complexity to upkeep inventory management plans for the retail chain.

Faced with concerns over increasing sales opportunities being lost to non-availability, the retail chain approached SIBIA to develop an automated inventory management system for each SKU, a week ahead of the actual purchase date.

## THE CONTEXT

The net sales volume for each SKU across multiple point-of-sales is a highly fluctuating number, which relies heavily on factors such as seasonality, consumer and product trends, availability of competitive SKUs, lost sales opportunities, time of the day and many more.

Supply chain executives are accountable for accurate demand estimation. The predicted figure becomes the base for replenishment plans, which have to be optimized such that both the high inventory and lost sales opportunities are minimized.

## THE PROBLEM(S)

The procurement division of the US-based retail chain was distracted by the time- and task-intensive process of preparing tallies for previous and upcoming purchase volumes for 10,000 SKUs. Especially in a case where these figures varied during the course of the weekly calendar. This reflected in the increasing number of lost sales opportunities.



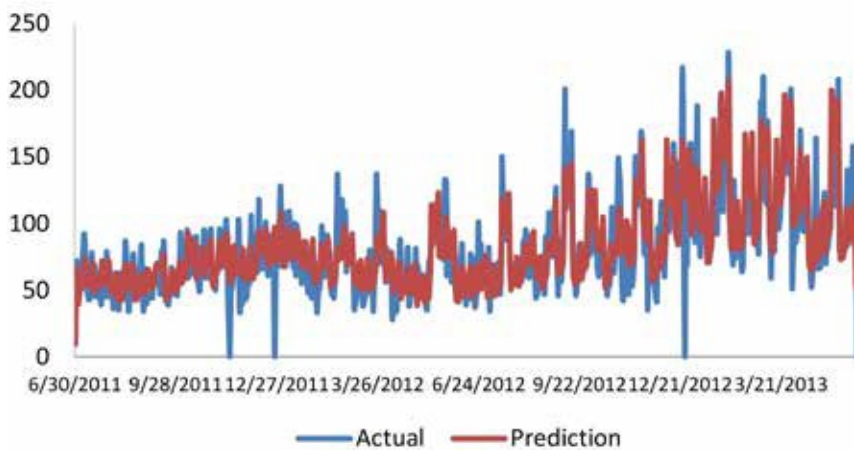


## THE SOLUTION

Our approach towards the case involved splitting of the forecasting algorithm model into two stages for development. During the first stage, we identified all pertinent factors that have a direct impact on the periodic sales volumes. The list of drivers include pricing impacts (self/competition), promotions, neighboring store activities, seasonality, and external factors.

The Hierarchical Bayesian Mixed Effects modeling was implemented in the process of preparing a baseline forecast with the available factors. Over the second stage, we built a self-optimizing time series model to capture the historical and real-time fluctuations in the demand to forecast expected demand volumes over the upcoming timelines.

We have employed our DemandPlanner solution platform to achieve all the goals.



The daily Sales forecasting - Product C



The solution generates 80% - 98% forecast accuracy, for different SKUs, week after week



## RESULT(S)

During the live testing phase it was observed that the solution is operating at 85%–98% forecast accuracy, for about 80% of SKUs, week after week. The client was enabled with a hassle-free, completely automated replenishment management system.