Supply Chain Best Practice: Demand Planning Using Point-of-Sale Data

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Multiple forecasts based on demand streams that are less indicative of actual sales activity have not been as successful in reducing out-of-stocks and increasing revenue as POS-driven forecasts. POS data provides a definitive view of what is really happening at the point in the supply chain where it matters most—your customer's retail shelf.

INTRODUCTION

Despite the widespread availability of network technology that makes sharing data easier than ever before, the adoption of demand planning based on point-of-sale (POS) data has been surprisingly slow. According to AMR Research, demand planning based on POS data is a supply chain best practice that increases revenue. Their research has shown that, "manufacturers with better demand visibility have a 17 percent better perfect order performance, carry 11 fewer days of inventory, and have cash-to-cash cycles that are 29 days shorter." (Source: The Handbook for Become Demand Driven, by Lora Cecere, AMR Research July 2005) POS-based forecasts generate these significant improvements because

- Forecasts are more responsive to changes in demand, especially those driven by promotions

- Localized demand patterns and demographics can be accounted for more precisely

- Inherent latency, dampening, and selling-tactic effects that result from the use of other demand streams, such as order or shipment history, are reduced

In addition to supporting forecasts that are more responsive to demand changes, using the POS demand stream provides a superior foundation for another best practice: the one-number plan. POS data is the richest source of information for sales and marketing to determine the effectiveness of their programs. Basing plans on multiple demand streams often leads to different plans by functional area and incurs additional costs to scrub and maintain the data. POS data provides a definitive view of what is really happening at the point in the supply chain where it matters most—your customer's retail shelf.
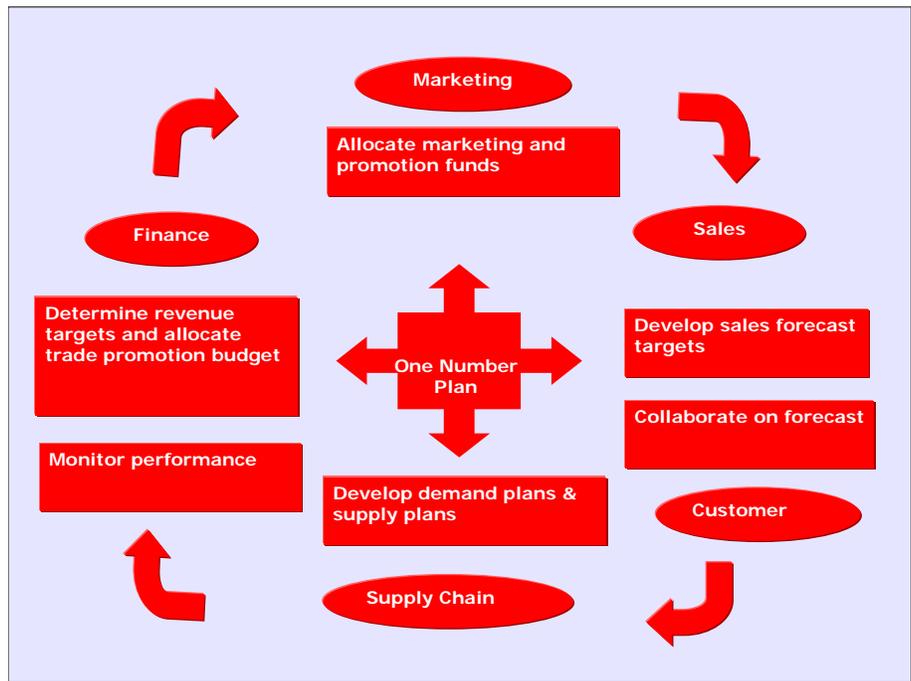
Figure 1: Using the POS demand stream provides a superior foundation for developing a collaborative, one-number plan.

POS Forecasts Are More Accurate

POS data provides the purest demand stream from which to develop future plans. POS data is usually available from the retailer daily or weekly for each store location. Forecasts based on this level of data are more accurate because they capture the effects of promotions and other causal factors more quickly. For example, one customer uses Oracle Demantra Real-Time Sales and Operations Planning to monitor daily POS data to spot demand trends for new products, where more than 80 percent of the lifetime sales volume occurs in the first four weeks of the product's release. POS forecasts are generated at the store level to capture consumer-buying patterns that often vary significantly at different locations for the same retailer. Even with this extreme example of volatile demand, high forecast accuracies are achieved because the POS data provides instant visibility to early sales trends. It also improves collaboration between the supplier and the customer as the customer also shares their forecasts usually along with the POS data.

Extracting value from POS data does not require that forecasting be done at the store level. POS data can be aggregated by region or globally to make forecast review more manageable and still maintain the detailed causal factors that ensure accuracy. Another customer uses Demantra Real-Time Sales and Operations Planning to create what they call "pull" demand planning based on weekly POS data that is aggregated to the retailer distribution center (DC) level. Even with this aggregation, the customer has achieved a 99 percent in-stock performance at the

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store level, 98 percent of orders shipped on time and complete, and a 6 percent increase in sales by using POS data.

POS Data Provides Better Visibility to Local Demand Patterns

While there is little argument that out-of-stocks at the store level result in lost revenue, there is little agreement on how to resolve the out-of-stock problems. The Grocery Manufacturers of America (GMA) reports the worldwide out-of-stock rate is 8.3 percent and jumps to 17 percent for promotional items. This tells us that although most retailers and manufacturers spend more time forecasting and planning promotional items, the net result of the extra attention is a two-fold increase in out-of-stocks. Although there are several aspects to solving the promotional out-of-stock problem, it starts with better POS data visibility to the local level (stores or store clusters). Local differences such as shelf facings, consumer buying patterns, store managers, sales reps, competition, and demographics can cause promotions to perform differently across various locations and retailers.

Forecasting engines based on Bayesian analysis (the approach used by Demantra Demand Driven Planning solutions) combine multiple forecast models to account for the complex interrelationships of multiple causal factors found at the store level. The accuracy and automated capabilities of the Bayesian forecast engine makes store-level forecasting practical because very few forecasts can be, or need to be, improved by manual intervention. Adding more scalability and intelligent exception message processing quickly pinpoints potential problems and routes them to the right person for resolution. Shipment, inventory, and order data can be used with POS data and forecasts to spot potential problems. For example, a comparison of the POS-driven forecast and promotional forecast (volume plan) data with shipments can be used to spot diverting. Without POS data analysis, diverting is likely to only show up in order history-based forecasting when the diverted product hits the market and orders from other retailers are canceled, leading to over-stocks.

POS Forecasts Are More Responsive

The availability of daily retail POS data is enabling near real-time visibility to consumer demand. With POS data from the first 24 to 48 hours of a promotion, retailers and manufacturers can much more accurately forecast promotion demand and refine plans accordingly.

Analyzing POS data properly and revising volume forecasts requires special tools. POS data is notoriously messy as a result of incorrect polling and scanning, antiquated IT systems, and other factors. To interpret POS data correctly and avoid mistaking noise for real shifts in demand, data must be carefully cleansed.

Once clean POS data is available, revising promotion lift forecasts requires techniques like shape modeling. Shape modeling assigns an overall demand curve shape based on past similar promotions, so that a revised forecast for total

promotion period demand can be accurately predicted based on just a day or two of POS data. With this near real-time intelligence, manufacturers and retailers can respond as soon as possible to unanticipated levels of demand. The following chart illustrates this concept.
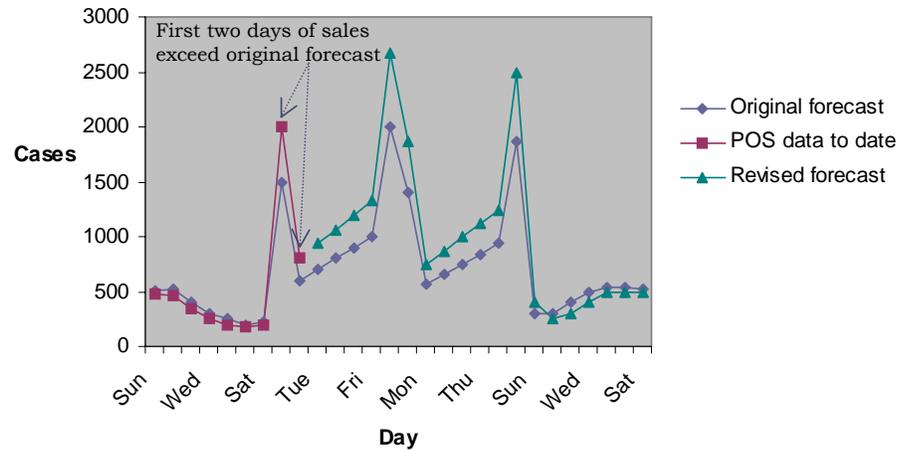
Figure 2: By analyzing POS data from the first 24 to 48 hours of a promotion, retailers and manufacturers can accurately forecast promotion demand and refine plans accordingly.

The Best Forecast Is Generated from the Best Demand Signal

With enormous improvements in network infrastructure, server processing power, low-cost storage, distributed processing techniques, and software algorithms, even the most granular forecasting can be done economically.

There is a common misconception that multiple forecasts based on different demand signals can be aggregated to provide a more accurate single forecast. In reality, the best forecast is generated from the best demand signal. For consumer products manufacturers, this is usually the POS data. Retailers often aggregate order history to the DC level. Thus, store-level activity is only available from syndicated data services such as ACNielsen—too late to be of much use for short-term forecasts. Order history also has inherent biases caused by buying and selling tactics that might have little to do with store sales. Shipment history is potentially even less accurate, as it is essentially order history minus out-of-stocks.

Today's Technology Makes POS-Driven Forecasting Practical

A common concern with POS-driven forecasts is handling the integration and volume of data required. With enormous improvements in network infrastructure, server processing power, low-cost storage, distributed processing techniques, and software algorithms, even the most granular forecasting can be done economically. Electronic data interchange (EDI), extensible markup language (XML), and private trading exchanges (such as Wal-Mart's RetailLink) make acquiring accurate POS data feasible and cost effective. Affordable storage networks make storing enormous amounts of POS data much more feasible than it was just a few years ago. Similarly, improvements in distributed processing technology now allow very large forecasting problems to be divided across the idle capacity of small servers.

The sum of all of these improvements means it is now possible to generate the best forecast across billions of data points.

CONCLUSION

Leading industry research firms such as AMR Research and Gartner identify one-number planning as a best practice. This calls for developing demand plans from the purest demand signal—generally POS data. Multiple forecasts based on demand streams that are less indicative of actual sales activity have not been as successful in reducing out-of-stocks and increasing revenue as POS-driven forecasts. Further supporting the value of POS data, the world's largest and most influential retailer, Wal-Mart, has invested heavily in its trading exchange, RetailLink, to make high-quality POS data available to its suppliers. Wal-Mart believes suppliers can further improve supply chain processes and reduce costs from the increased visibility provided by POS data. Its suppliers and competitors will need to follow.

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