INSIGHTS

Demand Planner for Microsoft Dynamics

White Paper

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Introduction

Businesses, regardless of their size or specialization, need to estimate and monitor demand for their goods and services in order to efficiently manage their operations. Reducing uncertainty of demand can significantly help businesses keep inventory and operating costs low while improving customer satisfaction. Further, by knowing the approximate demand for goods and services, businesses can appropriately allocate their resources for manufacturing or stock the right products in the right quantities. The process of estimating and monitoring customer demand is termed as "demand planning".

This paper discusses the significance of demand planning, illustrating how businesses can benefit from an estimation of demand for its goods and services. It also gives an overview of common demand planning processes describing various steps in these processes. The document further highlights how businesses can use a software solution to create and maintain a demand plan.

Business Significance

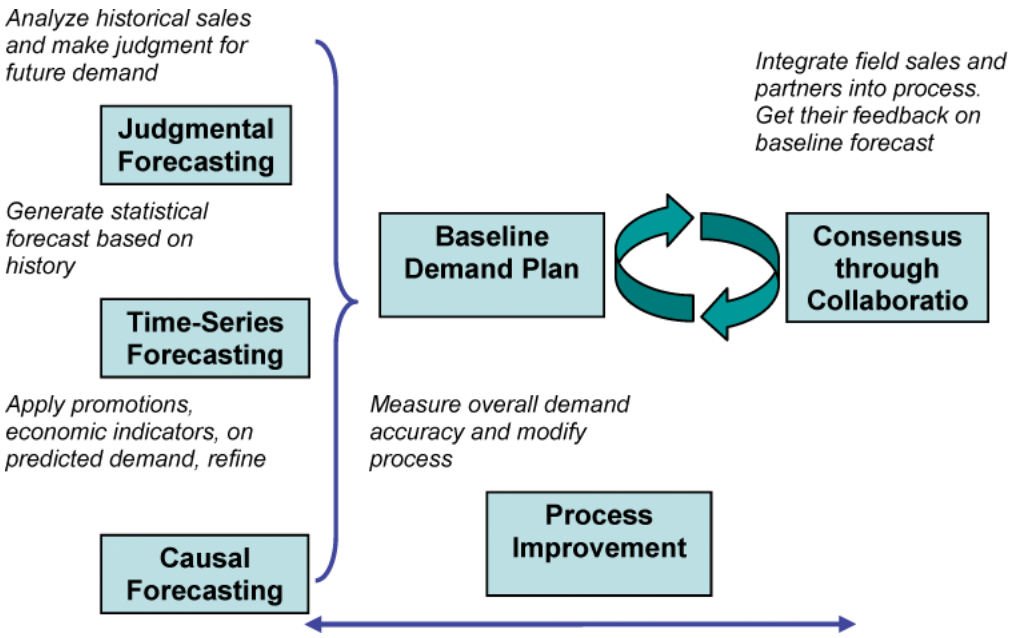
Businesses are constantly under pressure to improve their customer satisfaction while reducing their operational costs. In an environment where businesses compete aggressively to retain and gain customers, it becomes even more important for them to align their operations with the customer demand. Businesses can become demand driven by establishing demand planning practices and subsequently using the demand plan to manage their operations. By adapting to demand driven operations, businesses can benefit in the following ways:

- Improve customer satisfaction: Availability of goods and services that the customers ask for is one of the key pillars of customer satisfaction. Stock outs and delays in order fulfillment lead to quick customer attrition. With an estimate of what customers will buy in the future, businesses can make goods and services that are in greatest demand available when needed, thus minimizing stock outs and delays.
- Reduce inventory and obsolescence: Businesses cope with the uncertainty in demand by keeping inventory of goods; the larger the uncertainty, the larger the inventory. By reducing the variability and guesswork in the demand planning process, businesses can be more confident about customer demand, and can provide higher service levels while lowering overall inventory and thereby inventory costs. Additionally, with improved demand predictability, businesses can better plan for positioning supplies at the right place at the right time, thus reducing the lead time for goods and also reducing the obsolescence costs.
- Reduce operating costs and improve revenues: Increased demand certainty can significantly reduce the overall operating costs for businesses. They will only produce what is needed and resources will be used efficiently. Businesses would have to spend less time and money on expediting, fire-fighting, and managing other supply exceptions. By using an unambiguous demand picture, businesses can reduce shortages, thus realizing top-line revenue growth in the short term. Subsequently, long term demand projections can also help in capacity expansion decisions.

While important for both large and small businesses, the adoption of demand planning processes is not new to large enterprises; very few small businesses have been able to establish these processes. The main reason is often lack of resources to handle the process without a tool to assist. Usually, they start out with the correct impression that their local knowledge is sufficient to drive the constraint resource planning, and do not recognize the growth threshold at which that becomes unworkable.

Process Overview and Supporting Tools

The process of demand planning can involve a number of different activities from data collection and statistical analysis to seeking feedback from customers and sales representatives and consensus building across different organizations. It is typically a closed loop process, Initial or baseline forecasts are generated based on business experience and analysis of historical sales data, or by using statistical time series techniques. The baselines are then refined through collaboration with customers and other stakeholders within the business.



The following section will explain the processes in more detail and highlight what tools are needed to support the process.

Baseline Forecast Creation

Demand planning typically starts with creation of a baseline forecast from the historical knowledge and/or from the personal experience and intuition of the planner(s). This can include the following steps.

Data Visibility and Analysis

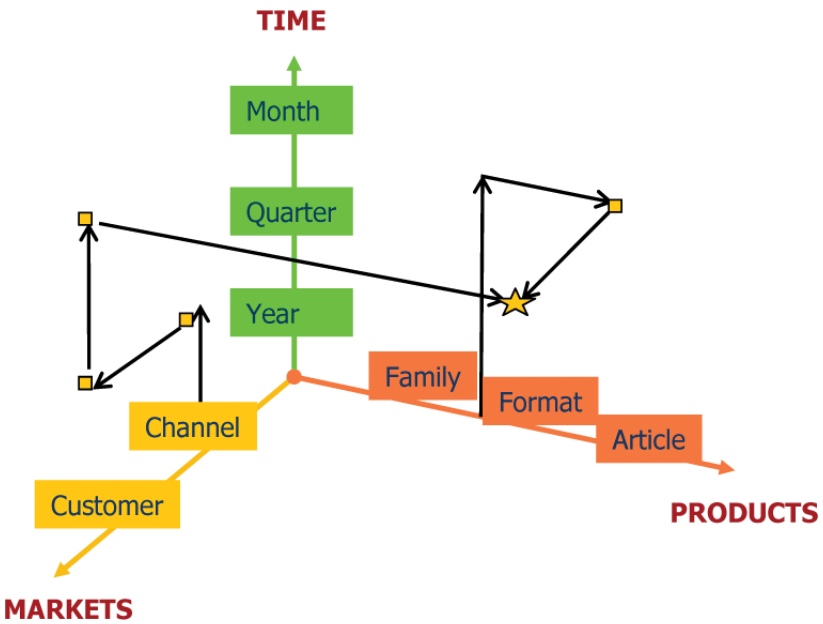
In order to predict future demand, businesses need to characterize customer behavior, understand buying patterns and customers' reaction to different external factors that impact demand. Businesses do this by conducting detailed data analysis. They look at the value of different demand indicators, such as past sales volume for a particular geographical market for a group of products, or average price for a particular product type across a season etc. The process of analysis typically includes hierarchical organization of key business entities, for example of products, customers, and geography or sales persons. Businesses establish a causal understanding of the demand patterns by viewing and comparing the value of key demand indicators at different levels of aggregation across these hierarchies. With this insight, they can make rough judgmental calls on what customers will buy going forward.

An efficient way to carry out such analysis is to use a multi-dimensional data modeling and analysis tool. It forces users to rationalize the data universe into a structured reasoning space that follows the specific business context of the business. The typical business dimensions are products, markets and time. More sophisticated models may include brands, or distribution channels or others. Each dimension can be logically organized into well-suited aggregations, for instance: items – product lines – product classes for the product dimension; area – country – region – world for the market class and week – month – quarter – year for the time dimension. Each business may define the most appropriate model for its business and organization.

Once the multi-dimensional model is defined, the analysis becomes a matter of navigating up and down (that is, by aggregation and dis-aggregation) in various dimensions to analyze data, exploring relationships, finding trends and, finally, projecting the past into the future, defining a forecast.

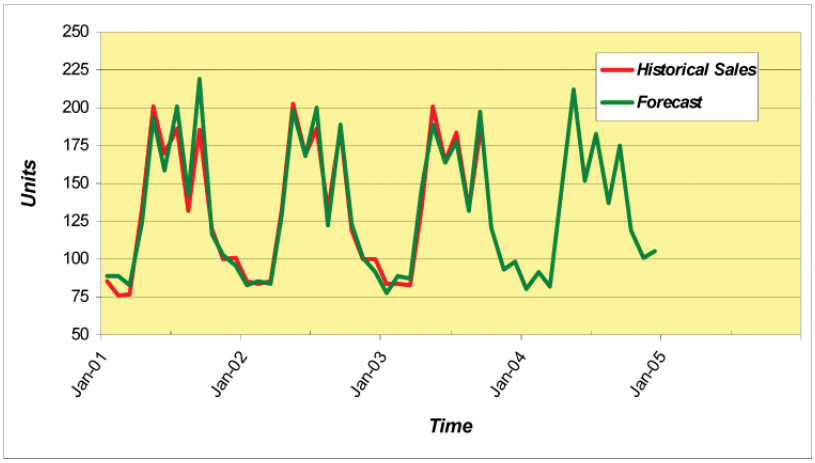
The adoption of a multi-dimensional data model among small and medium business has been limited. While the fear of incurring high ownership costs or limited deployment skills has been a factor, the main reason is probably the "quick and dirty" approach to the fundamental business process of demand planning. Most businesses either do not do in-depth sales analysis, or resort to a spreadsheet; adding sales numbers from multiple perspectives, creating reports for these sales figures, and synchronizing these reports together. The work involves extracting data from sales order systems, importing into spreadsheets, aggregating the data across different dimensions, and computing a series of values, ratios, compositions etc. Such an approach is usually risky, time consuming, unmanageable, error prone, and compromises the data visibility. This approach is likely to deliver limited business benefit. The use of spreadsheets soon becomes unmanageable. It is difficult to change a report, to add a new product line, to perform a new analysis. The cost of modification in terms of time and control of the results often prevents businesses from doing it.

On the contrary, setting a proper multi-dimensional model allows performing all possible, useful analysis, including possibly those not even thought of at the beginning. Moreover, it is much easier to modify the models as data is clearly organized and can be easily rearranged in a different, more insightful model. Such an approach also allows rapid identification of exceptions for products or regions where demand has not been tracking forecast, going significantly above or below. These products or regions are of great interest to the planners as they can give insight into the factors responsible for unpredictable demand behavior.



Statistical Forecasting Techniques

In addition to judgmental prediction based on data analysis, businesses can use statistical techniques to create demand models based on historical sales. Then they can project the future demand based on these models. These techniques identify factors that influence demand, decomposing the forecast into its different elements – trend, seasonality, cyclicality, random error, and causal elements. They can also calculate the confidence interval and accuracy of the forecasts.



Regression analysis and time series forecasting based on statistical techniques has been used in high volume product industries for many years. However, similar to the multi-dimensional data modeling and analysis tools, their use has been limited to large enterprises. Limiting factors are a lack of understanding of statistical techniques and mistrust. While auto-regressive modeling techniques do provide the best suited regression model that fits the demand pattern, thus eliminating or minimizing the need for understanding of these techniques, businesses are apprehensive about using tools that they do not understand. But at a minimum, time series forecasting could be used to generate a baseline or reference forecast that can be compared and tested against their prior judgmental predictions.

Refine Demand Plan

The next step in the demand planning process is to refine the baseline forecast by seeking feedback from different constituents in the business. The purpose of this step is to reach a consensus on a demand that can be used by all functions within the business. For example, it can be used to set budgeting goals to sales departments, to plan purchasing activities and so on. The company wide revenue target could be used to drive the right product mix and sales targets. The marketing and sales departments can then plan their marketing campaigns or sales discounts accordingly.

The most important step in the refinement process is to check the forecast against the supply planning tasks in a closed-loop approach. This allows appropriate adjustments in capacity and outsourcing according to demand. As a result, businesses can better utilize their assets for profitability. Refinement of demand plans can be achieved through the following process steps.

Consensus through Collaboration

Each department within a business carries its own perspective about future demand, and plans its activities accordingly. Since the business forecast drives subsequent operations within each department, a consensus on the demand plan among the various departments is the only way to ensure coordination of operations. For example, misalignment between marketing and operations on future demand can lead to excessive inventory and discounting for certain products, while running into a short supply for others.

Since demand planning is partly a judgmental process, one can refine forecasts and improve confidence levels by getting input from field sales and others who are in direct contact with the customers. They best understand what customers want and will buy in the future. A side benefit is that gathering input or validating the forecast with the sales organization and regional offices can foster accountability to the forecasts by the sales organization.

Businesses can further improve their demand plans by collaborating with their customers. Customers can provide input on their anticipated future purchases, which can reduce the guesswork in the demand planning process and provide a higher degree of certainty to the plan. While customers would never take financial responsibility for these forecasts, input from them can be extremely helpful in understanding the demand trends. Such a process can give businesses early warning of large demand changes so that they have sufficient time to adjust their operations. As a result they can better manage customer satisfaction by meeting increase in demand or, in the case of demand reductions, reduce operating costs and inventory positions.

While the benefits of demand collaboration are evident from the discussion above, and most businesses realize the importance of collaboration in demand planning process, facilitation of demand collaboration may not be very easy. One of the main hurdles is reconciliation of forecast numbers coming from different sources.

Sales organizations typically base their forecast on individual customers. They look at anticipated customer spending without getting into the details or composition of anticipated customer orders. While their input can be used as revenue forecast, it has little direct relevance for operations, as it rarely specifies product mix. Similarly, marketing organizations typically forecast for brand and geography combinations, seldom getting into individual product details. To ensure supply availability, operations need to work with individual product level forecasts.

A common interpretation of forecasts that are coming from multiple sources, then, is the key to successful collaborative forecasting processes. Businesses should have the capability of translating multiple forecast inputs to a common level and compare them easily to drive consensus. In order to foster collaboration, sales people and customers should not have to go through extensive training of complex collaborative tools. If the tools for collaboration are cumbersome, people would avoid using them. The tools should make it easy for sales people to do some quick data analysis, receive baseline forecasts, and provide their feedback. They should be able to view and edit forecast data from the perspective that is relevant to their role.

Closed-Loop Business Planning

Effective demand planning should involve a supply review and feedback process. The aim of the review is to quickly evaluate the forecast results and, if necessary, perform capacity and inventory checks. This is to ensure that the forecasted sales comply with the known constraints of the operations. It is also a fast check to see if the numbers seem reasonable and resemble the expected development of the demand. A closed loop process with appropriate supply planning can also estimate the feasibility and cost of meeting the forecasts. There is no point in having a demand plan that cannot be supported by a corresponding supply plan.

Looking at the feasibility of the supply plan, businesses can further adjust the demand plan, change product mix or make price changes to increase or decrease demand for certain items. A closed loop planning process puts a business plan in place that is feasible, meets business objectives, and can be successfully executed.

Demand Monitoring and Forecast Revisions

As business conditions change, the course of the business also changes and so does demand plan. A baseline forecast may be created to cover one business year, but it should be reviewed frequently on a rolling basis. While it is important for a company to set its "business trajectory" through the definition of a company-wide demand plan, it is also wise to adjust that trajectory as soon as possible when new information is available; new sales data can be added to the historical data and considered to verify or modify past forecasts. New information about markets, competitors, even political events – that were not known at the time of the preparation of the baseline forecast – can now be taken into account. In general, it is easier and more accurate to forecast for the near future compared to the distant future. Potentially, forecast reviews can follow the same steps as the creation of a baseline forecast. In practice, it is a matter of company organization and internal procedure to decide the process steps and the people involvement for a forecast review. Of course, there is a trade-off between the benefits of forecast review cycle and the costs of the underlying process; support tools enabling a cost reduction for the demand forecasting process allow increased frequency of forecast reviews. How tools can influence the costs of the process? Simply, reducing the time needed for the task: for instance, easy forecast comparison, automatic error calculation, scenario saving for future comparisons, easy data import/export and much more.

Summing Up

This paper has attempted to describe the key elements of demand planning and the benefits that can be derived by small and medium businesses. Until now, use of demand planning tools has primarily been limited to large enterprises. But the pressures of modern business, with increasing customer expectations and aggressive global competition, mean that even small and medium businesses must find ways to improve service levels and cut costs. While enterprise-level tools may not be appropriate, the key elements of demand planning are accessible and necessary for these businesses. Constantly changing competitive and customer context for any small and medium businesses make it imperative to plan demand in rational ways.

Software targeted at small and medium businesses should support the demand planning process with simple and intuitive tools. For example, flexible and exception based reporting and graphical forecasting tools that allow visual comparisons between computer-generated forecasts and human forecasts can aid in establishing baselines. Then, tight integration with communication & collaboration tools can enable consensus building and collaboration.

By applying these techniques, small and medium businesses can benefit from improved understanding and control of future demand, resulting in improved customer satisfaction, lower inventory, reduced operating costs, and improved top line revenue growth.