In Search of the Perfect Order

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Executive Summary

The perfect order is supply chain utopia. Balancing minimal inventory levels with filling customer orders on time, correctly, and in perfect condition creates high levels of customer satisfaction while reducing inventory costs. The key to the perfect order is quality demand planning and forecasting. However, this does not come easy. Processing forecast data is time consuming and supply chain managers look for work-arounds such as only running forecasts weekly or using aggregate data. The processing required to support perfect orders is not easily done in an ERP system. Teradata Corporation provides a solution that combines the processing power of the Teradata® system with the intelligence of SAP's demand planning. Teradata reduces processing time from days to just minutes and is able to handle the volumes of detailed data, which increases forecasting accuracy and moves manufacturing companies much closer to the perfect order.

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Defining the Perfect Order

Perfect Order (noun) – 1. Supply chain utopia

Customer loyalty is only as good as the last customer experience. When customers don't find the products on the retailer's shelf they've come to expect, efforts to establish and maintain product brand loyalty and retail store loyalty are put at risk. The customer will often settle for a competitor's products or go elsewhere to get what they want. To minimize the risk of creating an out-of-stock situation, one that hurts both the manufacturer and the retail store owner, manufacturers are in search of the elusive "perfect order": the ability to fill customers' orders *correctly*, *completely*, *on time*, and *in perfect condition*. Perfect orders not only drive customer loyalty for the product and store, but also have tangible benefits, such as supply chain efficiency and reduced investments in inventory.

Let's look at supply chain utopia for a moment. Think about how your business would be different if you could achieve perfect orders.

> Imagine your customers never needing to choose another brand because your products were always in stock.

> Imagine understanding your customer so well, you knew exactly when they would buy again.

> Imagine serving customers so well they never needed to return anything.

> Imagine producing goods only when they are needed, preventing overstock.

> Imagine creating promotions to test new products and attract new customers, not having to worry about too little or too much product in the channel.

> Imagine being able to know instantly when to divert stock to a different location where product is needed.

Benefits of the Perfect Order

Manufacturers and Consumer Products companies focused on becoming more demand driven reap significant rewards with perfect orders, including customer satisfaction and optimal inventory levels, translating directly into increased profits. According to AMR Research,* Demand Driven Supply Network (DDSN) leaders are more *demand sensing*, have more efforts for *demand shaping* and focus on profitable *demand response*. Based on AMR Benchmark Analytix data, the most advanced demand-sensing companies have 15% less inventory, a 17% better perfect order performance, and a 35% shorter cash to cash cycle time. AMR also reports that DDSN leaders have 10% higher revenue and 5% to7% better profit margins than their competitors.

Increase Customer Loyalty by Minimizing Stock-Outs

Creating a balance between minimal inventory levels and a limited chance of a stock-out is no easy task, but striking that balance can result in significant benefits. Too much inventory ties up precious capital, while too little creates the dreaded stock-out event. The last thing a retailer wants is to lose a customer over an empty shelf. Studies show that stock-out events represent 6.5% of all retail sales – a costly dilemma. Even when alternative product is available, the net loss is still an average of 3.1%.

The reward for minimal stock-outs is higher levels of customer satisfaction and loyalty. Customer loyalty increases when customers are able to get what they want, when they want it. However, if the desired item is missing from the shelf, customers are more likely to substitute a competitor's product or leave without purchasing the product they wanted. With perfect orders, customers can rely on their desired product being available, reducing the chance of switching to a competitor's product.

Minimize Capital Tied up in Inventory

Excess inventory on retail shelves, distributors' warehouses, or stockroom floors is expensive. Every day the product sits unsold, manufacturers incur carrying costs or even face the potential for inventory write-down. Overstocked retailers may return unsold merchandise that might not be resold, especially products with a short lifecycle, such as seasonal and holiday items. These returns hit manufacturers' bottom lines in terms of write-downs. With perfect orders, inventory matches demand, maximizing profits.

* Source: AMR Research 2006, Lora Cecere author of The Handbook for Becoming Demand Driven.

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Why Reaching the Perfect Order Is Challenging

At the heart of a perfect order is quality demand planning which is no easy task. Demand planning forecasts product demand by looking at various selling factors such as previous sales, effects of promotions, product lifecycle, supplier part availability, transportation, and customer demographic and geographic attributes. This is a collaborative process involving data from a variety of sources including ERP systems, suppliers, distributors, retailers, as well as additional information from Sales and Marketing. Demand planning and forecasting is the foundation of the Supply Chain process and the key to moving towards that perfect order.

Demand forecasts drive manufacturers' most critical investment decisions, yet the typical forecast is off by 35% on average. Focusing on improved demand planning and decreasing forecast error translates into real money to a company's top and bottom lines. Customer studies and industry analysts report that the leading companies focused on becoming demand driven achieve significant value as illustrated below:

Revenue
> Increase fill rates and reduce out-of-stocks 3% – 10%

Operating cost
> Increase production efficiencies 1% – 5%

> Decrease freight costs 5% – 15%

> Improve personnel productivity 7% – 12%

> Reduce obsolescence and waste 35% – 50%

Working capital
> Reduce inventory levels 7% – 15%

> Improve asset utilization 10% – 15%

> Decrease cash-to-cash cycle 10% – 30%

Demand planning applications like SAP's mySAP™ Supply Chain Management (SCM) Advanced Planning & Optimization (APO) module allow companies to produce demand forecasts and integrate those forecasts into a suite of additional Supply Chain modules to manage inventory production and delivery. While integration across the Supply Chain is necessary to deliver a perfect order, there are challenges inherent in the demand planning process itself.

Lack of Timely Forecasts

Most forecasts are outdated almost as soon as they are produced. Supply Chain managers typically run forecasts weekly and sometimes only monthly in an ERP system. Changes in the business and the marketplace can happen daily. Current systems find it difficult to capture these frequent business changes that have an impact on demand. The source of the issue lies in the time it takes to process the data necessary for the forecast. Loading and processing data are not the strengths of an ERP system.

Unable to Leverage Detail Data

Many forecasters settle for using aggregate data to create demand forecasting. Detailed SKU or other granular-level data is either not available or is too difficult to process in a timely manner.

Aggregate forecasts tend to hide the source of forecast error. For example, if there is a run on cold and flu medicine, due to an outbreak in a specific region such as Boise, the trend may get missed in the forecast at the Pacific Northwest aggregate. Using aggregate data for demand planning also reduces business insight into price elasticity and promotional effectiveness.

Companies have critical supply chain data that is not currently used in the demand planning process. This includes point-of-sale data, distributor data, and Sales and Marketing customer data. Forecasters give up most of their accuracy in the loss of details, not able to leverage the mountains of data available to them. Solving that problem has big benefits. According to AMR Research a 1% improvement in forecast accuracy can result in millions of dollars to the company's top and bottom lines.

Difficulty Integrating Additional Data

SAP's strength is its ability to manage the complex supply chain integration across the full product lifecycle. However, loading and processing data from the necessary variety of sources can be a very long process. Some customers experience loading non-SAP data can be difficult and

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can take hours and even days to process and produce results. All of this diverted processing power takes a toll on SAP's end users. This constraint results in forecasters reducing their forecasting frequency and drives them to rely on aggregate data.

Moving Towards the Perfect Order

In order to achieve the perfect order, demand forecasts need to be run frequently and in detail to capture influential events. Supply chain managers must analyze forecast error to better understand opportunities. They must analyze the trade-off between inventory and service levels, and analyze seasonal trends and inventory builds to maximize customer service levels. Companies must move to a common, shared, one-number forecast and continually update, review, and adjust

inventory plans. This best-practice result can increase the profit margin by .5% of revenue as a result of reduced inventory write-offs and decreased inventory carrying costs.

Integrate Internal and External Enterprise Data

To realize the benefits of a perfect order, companies must have a solution that combines supply chain data with internal data from Sales, Marketing, Finance, and Product Development and external data from point of sale (POS), suppliers, and distributors. Integration must be quick and easy to allow forecasters to respond to events that impact the supply chain.

Make Detailed Data Easy to Use

Companies also need to manage the large volumes of granular-level detail needed

to produce the most accurate forecast. For SAP users, this means integrating supply chain data from SAP with company data, leveraging daily or even intra-day SKU/Location data. The data must be modeled in such a way that it not only supports the forecasting process, but is able to provide additional pre- and post-event analysis.
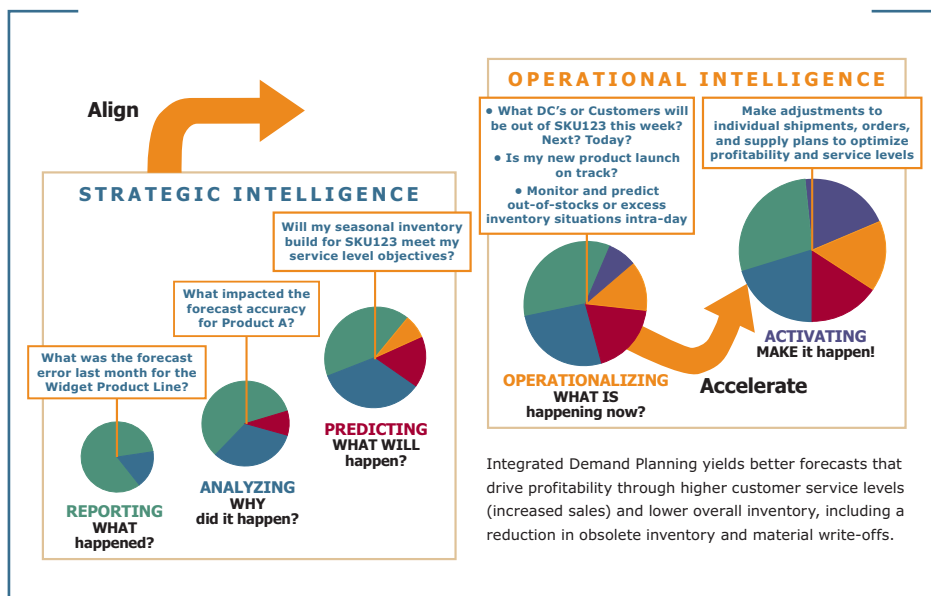
Improve Forecasting with Automated Analysis

Analysis is a key ingredient to good forecasting. As companies move toward the perfect order, the analysis becomes more automatic and real-time. Best-in-class companies have moved from relying only on strategic intelligence to combining strategic intelligence with operational intelligence. However, supply chain managers need powerful, integrated demand planning solutions in place to reach this high-level capability.

Teradata Supply Chain Accelerator, for SAP Demand Planning

Teradata integrates the best of breed data warehouse with the intelligence of SAP through its Supply Chain Accelerator. By harnessing the power of detailed and historical data, Supply Chain Accelerator drives more accurate and frequent demand planning, helping SAP users gain active business intelligence about their supply chain.

Supply Chain Accelerator allows forecasters to improve accuracy and increase

Align

STRATEGIC INTELLIGENCE

What was the forecast error last month for the Widget Product Line?

What impacted the forecast accuracy for Product A?

Will my seasonal inventory build for SKU123 meet my service level objectives?

REPORTING WHAT happened?

ANALYZING WHY did it happen?

PREDICTING WHAT WILL happen?

OPERATIONAL INTELLIGENCE

• What DC's or Customers will be out of SKU123 this week? Next? Today?
• Is my new product launch on track?
• Monitor and predict out-of-stocks or excess inventory situations intra-day

Make adjustments to individual shipments, orders, and supply plans to optimize profitability and service levels

OPERATIONALIZING WHAT IS happening now?

Accelerate

ACTIVATING MAKE it happen!

Integrated Demand Planning yields better forecasts that drive profitability through higher customer service levels (increased sales) and lower overall inventory, including a reduction in obsolete inventory and material write-offs.

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In Search of the Perfect Order

forecast frequency by making additional, atomic-level data available and easy to load, and reducing processing time from hours and days to just minutes. By leveraging its ability to process large volumes of data, Teradata quickly allows manufacturing firms to enhance forecasting quality and move towards the perfect order.

Supply Chain Accelerator Meets Requirements of Perfect Order

Perfect orders require improvements first to demand planning. Supply Chain Accelerator enables these improvements through:

> **Speed**

- Eliminate multi-hour wait times to develop forecasts
- Enable what-if analysis, scenario modeling, and forecast comparisons
- Identify discrepancies in time to make a change

> **Detail**

- Use detail-level POS and transaction data to improve accuracy
- Alleviate SAP® Business Information Warehouse (SAP BW) overhead with appropriate use of aggregation
- Create better insight into price elasticity, uplift effects, affinity, and cannibalization
- Develop plan versus actual by store/sku/day to optimize inventory and service

> **History**

- Leverage years of detailed data for accurate assumptions

- Improve assumptions for seasonality, promo uplift, and event demand
- Gain insights into product life cycle: NPI (new product introduction) and EOL (end of life) trends

> **Frequency**

- Harness Teradata's power for real-time monitoring
- Respond faster to unexpected deviations from plan (trigger alerts or re-plan)
- Delay production and distribution until promo or event uplift is confirmed

The Supply Chain Accelerator Solution

Teradata Supply Chain Accelerator is a complete solution that enables true active data warehousing by combining demand planning data with additional data from a variety of source systems, leveraging Teradata's robust processing capabilities. The solution comes with the following:

> **Teradata Manufacturing Logical Data Model (mLDM), with over 20 subject areas in support of demand planning.** The Teradata mLDM provides a comprehensive and flexible blueprint for building a data warehouse to support manufacturing. Custom-built for the manufacturing industry, it allows data from a variety of sources to be combined to provide analysis in manufacturing, supply chain, financial management, and customer management. The Teradata mLDM is the foundation for building a demand

signal repository and supporting powerful predictive analytics that sense and respond to real-time demand signals. Using time-proven modeling methodologies, the mLDM protects your data warehouse investment and accelerates data warehouse implementation time.

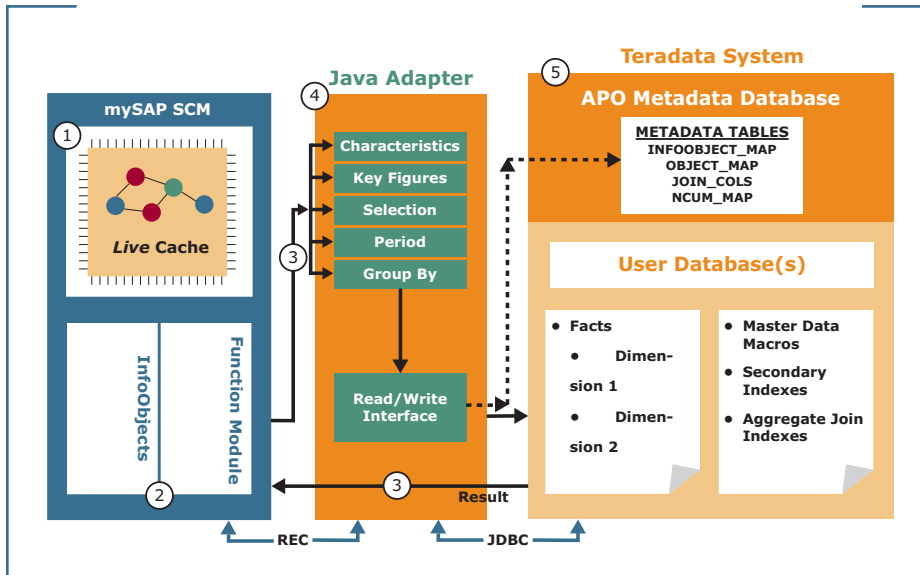> **A java-based adapter, directly connecting Teradata to SAP's APO LiveCache.** By connecting SAP APO to Teradata, data is easily moved into SAP for forecast creation and back to Teradata for reporting. Teradata partnered with Bristlecone Labs, a division of Bristlecone Inc., to develop a java-based adapter that allows for seamless data transfer.

> **Consulting methodology to implement and integrate the software components.** A combination of Teradata Professional Services and Bristlecone's deep expertise in SAP ensures a quality implementation of the Supply Chain Accelerator solution. Bristlecone is a leading provider of supply chain management consulting services and offers implementation services for SAP NetWeaver® certification and integration through its global delivery model. Teradata Professional Services provides a combination of experience, expertise, and proven processes. No one knows more about delivering data warehouse implementation – and no one better understands *your* business needs – than Teradata Professional Services consultants.

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In Search of the Perfect Order

Data Movement Between Teradata and SAP

The diagram above shows the movement of demand planning data and creation of forecasts. The data flows as follows:

1. Source data is loaded into the Teradata system

2. Using the Teradata Supply Chain Accelerator adapter, data is moved into LiveCache providing metadata and master data synchronization

3. SAP APO forecasts are calculated and sent back to LiveCache

4. LiveCache populates the Teradata system

5. End user reporting tools access the data

Additional Benefits of Supply Chain Accelerator

While Supply Chain Accelerator offers substantial benefits brought about by improved demand planning, it also offers the following additional benefits:

> Teradata serves as the source to create demand planning master data, storing once and using many times across applications

> Reduces redundant storage and overhead in SAP BW

> Teradata provides the interface for mapping fields of SAP APO Planning area and Manufacturing Logical Data Model, leveraging modeling best practices

> Data modeling and maintenance is done on Teradata, which is easier to manage

> Enables advanced planning analytics (exception and parameter mgmt) – xApp opportunities to extend SAP functionality on Teradata

> Provides automatic Characteristic Value Combination (CVC) creation

> Reduces Total Cost of Ownership through data mart consolidation

Building on its success, Teradata will add Supply Network Planning (SNP) and Product Planning/Demand Scheduling (PP/DS) to the Supply Chain Accelerator solution. Extending the benefits of Teradata and SAP even further, the future brings xApp integration to manage SKU-level planning.

Summary

Teradata Supply Chain Accelerator extends your SAP investment by enabling cross-functional forecasting and analytics. Teradata focuses exclusively on data management and is an expert in all aspects of data. The combination of deep data management expertise and a best-in-class warehouse technology coupled with SAP's demand planning enables accurate, near real-time, single number forecasting – the cornerstone of the perfect order.

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