IMPLEMENTING A FULLY INTEGRATED SALES FORECASTING SOLUTION

By Charles W. Chase Jr.

Describes in detail what kind of forecasting system businesses should be looking for and why … system should be built around a process not the process around the system … the best corporate data warehouse is one that can untangle and consolidate the maze of sales, marketing, and financial data, as well as other information, needed to manage the sales forecast.

During the past decade data availability and quality has improved substantially along with the ability to store it. It is not unusual to hear about companies who have over a terabyte of information stored in their enterprise data warehouses. As a result, companies have been asking for more fact-based forecasting and analytics to make quicker decisions closer to their customers and consumers. This situation has opened the door for predictive analytics as companies strive to uncover patterns in consumer behavior, measure the effectiveness of marketing investment strategies, and optimize financial performance. Nevertheless, improving forecast accuracy will still play a critical role in driving incremental volume and profit as companies continue to harness the power of information to better serve their customers.

The ability to interactively gather all the appropriate information required to produce accurate forecasts is still the single most important aspect of developing a good forecasting system. The failure to update your forecasting systems data collection capabilities could inhibit you from taking advantage of the enhanced data granularity, which has improved substantially over the last decade along with storage capacity. Those companies who kept pace with new technology will experience the benefits of improved marketing intelligence, increased forecast accuracy, lower finished goods inventories, and higher customer satisfaction.

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Recent benchmarking surveys define the best sales forecasting solution as one that provides easy access through a thin client layer UI (User Interface); provides review and modification of sales forecast results across all corporate disciplines via a web/portal interface; includes a complete tool box of forecasting methods and modeling capabilities; has the ability to create a knowledge base by which future forecasts can be redefined; provides timely and accurate ad hoc reporting capabilities; and supports automated link/feed interfaces with other system databases both internally and externally across the company's technology infrastructure where vital information resides. Such information includes A.C. Nielsen/IRI syndicated data, POS (Point-of-Sale) data, corporate marketing expense information, internal financial information, and shipment history.

The advent of the PC along with advances in statistical software development are making it possible for businesses to mine and analyze the reams of information/data that they have collected over the past decade. Such capabilities were previously privileged only to academics at major universities who had access to shared mainframe technology and the resources to program the statistical algorithms required to analyze large data sets. As a result, mainframes have become obsolete processors, and for the most part are now utilized as giant storage bins. However, a large majority of the PC based statistical applications on the market today are nothing more than forecasting engines that interact with the data via a cumbersome

interface that utilizes spreadsheet programs such as Excel for data manipulation. Meanwhile, PC based client server applications that access relational database architectures have been gaining wide acceptance throughout all industries as a viable solution to solving the integration issues. Unfortunately, there are only a few vendors who can truly provide a fully integrated sales forecasting solution that takes advantage of the flexibility that client server technology offers. This is done through the integration of ETL (Extract, Transform, and Load) applications, which links disparate data warehouses (and/or data marts) through a common layer of Meta Data, facilitating the synchronization of large data sets. Meta data is essentially "data about data" and is the self-describing nature of the database that provides independence from programming. All the meta-data definitions used by all the processes in the warehouse are stored in a separate area of the data warehouse stores. Meta-data is used for a variety of purposes including the ETL processes that use meta-data to map data sources to a common view of the information within the data warehouse.

THE SYSTEM IS NOT A PROCESS

When designing, developing and implementing a sales forecasting solution, or any system for that matter, one must realize that the system itself is not a process. On the contrary, it is the supporting tool that facilitates the process**.** In other words, the system must be built around the sales forecasting process, "*not*" the sales forecasting process around the system. Unfortunately, most integrated proprietary closed system solutions, particularly those off-the-shelf, assume that your process was designed around their system. Companies who purchase such systems for sales forecasting have two choices either re-engineer the process they just re-engineered to fit the system, or redesign and program the system to accommodate their process. In almost every case the company ends up doing a combination of the two, costing thousands of dollars in additional resources and consulting fees. In many cases, these situations result in failure as the new redesigned system is no longer optimized to meet the original specifications of the project. The additional time, costs and resources could have been avoided if companies took the time to understand that all system designs require some level of customization. Unfortunately, many off-the-shelf forecasting solutions leave little room for company-specific customization, limiting reporting capabilities as hierarchical disaggregation routines and override functionality are compromised due to the restricted environment allowing only one-way aggregation (i.e., vertical).

A large majority of the forecasting solutions on the market today use one-dimensional quantitative methods to forecast, usually a time series method such as Winter's Three Parameter Exponential Smoothing, as they are easier to systematize and require less database maintenance. The lack of sophisticated methods tends to be the result of the view that the forecasting function is an operational rather than a sales/marketing driven process. Most operational processes are more focused on planning inventory levels and meeting shipments from the manufacturer to the retailer, rather than understanding what drives consumer demand at the retailer chain level. The current trend, particularly in the CPG and Retail industries is evolving toward understanding and predicting consumer demand, which requires a greater degree of depth and breadth of analytics to determine how marketing investment strategies drive consumer purchasing behavior. Nevertheless, solution providers continue to supplement their supply chain solutions with mediocre at best forecasting analytical engines to drive their statistical baseline projections, focusing primarily on predicting seasonality and trend, rather than more causal factors that influence consumer demand. The bottom line is that there is no real fully integrated supply chain solution on the market today that contains an adequate sales forecasting module to support dynamic market intelligence, simulation, and forecasting. Most supply chain solutions focus on operational processes such as Supply Network Planning, Master Planning Scheduling (MPS), Distribution Requirements Planning (DRP), and Demand Planning with little attention toward sales forecasting other than a simple time series methodology, minimal causal analysis, and no simulation and/or optimization capabilities.

Simply put, the system should be made up of a combination (bundle) of integrated off-the-shelf software components that are linked through a customized thin client layer of repeatable UI. There is "no" real off-the-shelf integrated solution that can solve all the sales forecasting issues surrounding every situation. Some customization is always required, especially, given the complexities of today's marketplace.

THE IMPORTANCE OF A DATA WAREHOUSE

To succeed in implementing a forecasting system the forecast practitioner must have the right information to uncover seasonal patterns, trends, predict market changes, analyze customer level trade promotion performance, measure sales promotion impact, measure advertising effectiveness, and much more. Although most companies have access to this information/data, it usually resides in various fragmented disparate databases (and/or data marts) that are unable to communicate easily with one another. Furthermore, these systems were never built to handle complex queries in a timely manner. Data queries made through the Management Information Systems (MIS) department may take days or even weeks to be completed. As a result, decision support analysis is not readily available, forcing critical sales forecasts to be made on gut or intuitive feelings.

This is why it is important to develop a corporate data warehouse that fits your business needs. The job of a corporate data warehouse (CDW) is to untangle and consolidate the maze of sales, marketing, financial, and external information needed to manage the sales forecast. It archives the data by extracting and cleaning (or filtering) the information using ETL applications,

storing it away from operational systems in a relational enterprise data warehouse using Meta Data to manage and coordinate the processes required to access and analyze large data sets. Subsequently, it allows easy access and analysis by end users (i.e., sales, marketing, finance, sales forecasters, and executive management) who are business decision makers, not IT programmers.

RECOMMENDED SYSTEM DESIGN

Like any other systems design and implementation project, the quality of the upfront planning, the level of understanding of the process by the development team, and most of all, the support of senior management (Corporate Sponsor/ Champion) have a far greater impact on the success of the forecasting solution implementation than anything else. Forecast practitioners contemplating the implementation of a fully integrated sales forecasting solution should recognize that for many users this will involve a major cultural change. The most obvious change is that data analysis tasks will be shifted from management information systems staff and/or forecast practitioners to users at all levels of the organization. Consequently, getting started does not mean trying to design the perfect system solution. A forecasting solution should be designed to grow and expand as your needs and abilities grow. This is why the system should be interactive, multi-dimensional, and PC based with an open non-proprietary architecture. It should also have a thin client layer of UI that allows easy access and maneuverability across all dimensions with the depth and breadth of advanced analytics to determine how marketing investment strategies drive consumer demand.

Interactive means the system should be interactive with the entire user community. For example, all the disciplines such as marketing, field sales, finance, finished goods planning, senior management, and customers have access to the forecasting system. In fact, the marketing and field sales organizations must be able to interactively participate in the sales forecasting process and, if necessary, have the authorization to make overrides at various levels in the product hierarchy. If finished goods planning, finance, and senior management have access to various reports, they can query the database to conduct basic ad hoc analysis, such as viewing year ago actuals versus current forecast. Subsequently, customers can interact by inputting their forecast views for comparison to the statistical baseline and company overrides.

Multi-dimensional PC based means the system should ensure that both time series and causal modeling methods are available with the touch and feel that a PC software engine offers. It should also provide forecast model capability at the brand aggregate, sub-brand aggregate, and Stock Keeping Unit (SKU) levels. Complete drill down, up, and around functionality should be available when reviewing reports. Finally, the system must have on-the-fly ad hoc reporting capabilities with private and public viewing authorization.

Open non-proprietary architecture implies that the system is built like a Lego set. Each component linked to one another by a common element through a seamless user interface. In other words, it should have the capabilities to combine multiple off-the-shelf software applications, such as data warehouse administration applications/tools, forecast engines, balanced scorecard/reporting, and web/ portal access tools to create an integrated solution. Furthermore, those components can be customized to fit the sales forecasting process and modified as the process changes without disrupting the integrity of the information flow. For example, a user's request for enhancements can be implemented by simply replacing one component with a more enhanced version and/or adding a completely new component without shutting down the entire system.

Finally, a relational database design is essential to store and stage information/ data. A relational database is a software tool that stores and manages data in a corporate data warehouse along with a set of rules (Meta Data). Sometimes, all the information of interest to a business operation can be stored in one place (or table). For example, let's say the only data you need to maintain about your business is a description of each item, its supplier, and the quantity on hand. It would be adequate to have one business table with those data items as the fields. More often, though, business applications involve many tables. In a typical company application, there might be one table for product names and description, another for information about each product's geographic location and channels of distribution, and another for the unit of measures each product can be purchased. Relational databases make it very easy to link the data in multiple tables; matching a product to a location or channel in which it can be purchased is one example. This is a key feature of a relational database management system. It stores data in two or more tables and enable you to define relationships between the tables. The link between the tables is based on one or more field values common to both tables. Such tools offer superior performance and manageability of the data by linking disparate data tables through common references, such as product codes, customer names, UPC (unique product code) numbers. These database engines could well be the catalyst for the success of a system design.

Only a handful of companies have experienced the forecasting solutions described in this article. However, many others are adopting these architectures to solve their common forecasting needs. As the price and performance costs for data processing continue to fall, and the pains of forecasting become more evident, companies will seek out more integrated solutions to meet their forecasting needs.■

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