Tailoring your ERP System to meet your needs

BY JOHN A. ESTEP

You've just decided to plunk down $60,000 for the new car of your dreams. Is it everything you always wanted? Well, not quite. Look at the tires. Will that brand of tires hold up in tough winters? What about that bicycle rack the dealer offered? It holds only two bikes?

What do you do? First, call the tire store you've been dealing with for years and ask them what they'll give you in trade for a brand new set of no-name tires. Next, buy a brand you can rely on.

You decide to pass on the dealer's bike rack offer and accept your trusted bike shop's suggestion that they install a sturdy four-bike model. All together, it wasn't much extra, and now you're really satisfied with your new wheels.

Buying a new Enterprise Resource Planning (ERP) or Warehouse Management System (WMS) is similar in many respects. The "we've-got-it-all-no-matter-what-your-need" system probably will suffice for many functions, but it may not offer enough depth for certain critical decision support areas.

So, what do you do? First, assess your needs and compare them to the functionality offered by the system you've selected. Next, it might be a good idea to find specialists with "add-on" capabilities who can address needs not addressed by your primary ERP system. If you've chosen wisely, hooking the two together won't be much more difficult than replacing one brand of tires with another.

Forecasting and inventory planning

This is one application that usually suffers from the "wide-but-not-deep approach." This article will examine several critical functions necessary to the success of this application, with examples drawn from various industries involving several popular ERP/MRP/WMS/Supply Chain systems. For brevity's sake we will refer to these simply as "ERP" systems.

The common thread linking many companies is that they end up identifying critical missing components in their chosen system's forecasting and inventory planning capabilities and, as a consequence, frequently install a third-party forecasting package.

While all of the ERP systems mentioned later in this article are regarded highly—and offer excellent tools in their core areas—no single system can excel at everything. Resources are always finite, and resources committed to one area are resources withheld from other areas.

According to Gary Behr, manager of Diesel Engine Unit Exchange for GE Transportation Systems, a leading U.S. manufacturer of locomotives, "There is no one package that does it all. The tools required to do spare parts forecasting and inventory planning to any acceptable degree are so specialized that no generalist could have the expertise to create them."

Sophistication vs. usability

That doesn't mean the result must be less usable. When properly executed, sophistication should improve usability. Marson Corp., a Chelsea, Massachusetts, manufacturer of rivets and other products, has used *MAPICS* since the early 1980s. In late 1993, Ric Wilbur, director of operations and technology, replaced a manual process with the system's forecasting module to get a better handle on expected demand and the inventory required to meet customer service objectives.

According to Wilbur, the attempt was terminated after 18 months. "We started to load the forecasting module, but stopped because it required the user to input many parameters manually. With thousands of products, our users simply didn't have the time to do it." Eventually, the company installed a third-party forecasting and inventory planning package. Wilbur noted that *MAPICS* requires *users* to tell the system whether an item is seasonal. Today, his new system tells *him* whether an item is seasonal, and characterizes the seasonality for him.

Integrated inventory planning

Integrated inventory planning is the most critical—but often the most insufficient—component of a good forecasting system. A forecast is not a number, but a range. For example, suppose the forecast for October is 2,000 units plus another 250 units (safety stock) to achieve 98% service. Higher service requires more inventory; lower service requires less. The safety stock should be computed from service target, forecast error, error distribution, replenishment frequency, and lead time, among other things. It should not be a fixed-time-supply guess, which usually places too much inventory in most items, while putting too little in a few. The result often yields the frustrating combination of high inventory and low service. You should be able to specify the service target and compute the inventory required for each item, or specify the inventory and compute the service it delivers.

According to the inventory planning manager for U.S. operations of a major international electronics manufacturer, its selection of *Manman X* software was based on the system's comprehensive coverage in many areas. But that coverage didn't include the ability to set service targets and see the resulting inventory, or to set inventory budgets and discover what customer service those budgets would support. To obtain those functions, they too installed a forecasting and inventory planning system. Asked if they would do it again, the reply was, "Yes, but we'd do it sooner."

Selectable forecast calendars

With today's fast computers, you don't have to treat all items alike. Instead, you can treat each appropriately. Fast moving products are more accurately forecasted using weekly or bi-weekly calendars. Slow moving products do better on calendars ranging from bi-monthly to annual. Generally, it's a good rule to forecast on a monthly basis only those items that need to be forecasted monthly. This saves work, especially if your system doesn't require you to put different calendars in separate databases.

At Lockheed Martin, senior forecast analyst for service parts John Streett, notes, "a large number of our parts have sparse demand." He includes parts for products that are no longer in production, but are still being used by customers. Forecasting these items less often than on a monthly basis makes good sense. By interfacing their ERP system with a forecasting and inventory planning system, Street realizes substantially lower forecast error and, therefore, a lower inventory to meet service targets.

Up-to-date forecasting logic

Forecast models should account for the level (rate of demand per period), trend (rate of increase or decrease), and seasonality (periodic fluctuations around the trend line). Less capable systems often are missing seasonality or trend models and may offer only simple moving averages or exponentially smoothed averages.

Seasonality poses the greatest problems. Some seasonal models often lack orthogonality, which means that certain effects are overlooked while others are counted twice, producing

inappropriate, wildly fluctuating forecasts. Base (or seasonal) indices, for example, confuse trend and seasonal effects (e.g., failing to detect a seasonal peak in a declining market), and cannot use partial years of history. Good alternatives are systems using Fourier models, which also excel at handling items with sparse demand.

Separate forecast initialization and revision processes

Forecast initialization (model fitting) is the process of discovering the most appropriate model for each item. The revision process tweaks these models to reflect recent experience.

Why not fit new models every period? Most companies' products exhibit fundamental stability most of the time. If a forecast model accurately represents the underlying demand, it will be effective for some time. There are changes, but they are usually in degree, not in kind.

The forecast revision process serves two purposes: to make changes in degree, which keep the model current, and to identify items where the model no longer appears appropriate. This lets you concentrate on the 10 percent (typically) of items for which the market appears to have changed. You can ignore the other 90 percent.

You want to spend time *solving* problems, not *looking* for them. The best solutions use statistical process control (SPC) techniques to direct your attention and prioritize exceptions, so you review important items first.

Watch out for focus type or other types of systems that lack a separate revision process. Typically, a revision process reduces forecast errors and inventory 30 percent in the year or two following the model fit.

An example of this strategy will soon take place at the Ontario, California, GE Aviation Service Operation. Inventory programs manager Tom Roell is preparing to install the Oracle Applications as his ERP system. In conjunction with his new ERP system, Roell has installed a forecasting and inventory planning system. "Our forecasting system has separate model fitting and forecast revision processes," Roell says. He reports significant improvements in parts availability, inventory levels, and reduced expediting.

Accurate selling-day adjustment

While some ERP systems understand that February has fewer selling days than August, you want one that also recognizes that January may have more selling days this year than next. An ERP system does this if you're asked to enter selling or non-selling days for past and future years. Otherwise, the system applies a single set of factors to all years, or it ignores the calendar effect all together. It's important to have the ability to define your own calendars. In some businesses, the calendar effect is the principal reason behind changes in the demand pattern.

Flexibility

A forecasting system should be able to grow with you, because your needs will change. Flexibility is the key to growth. Look for a user-modifiable and extendible database, rather than one that has all the fields you need now. In six months, you'll need more. You should be able to add or modify fields any time and use them in reports, summaries, interfaces, calculations, and screens. Interfaces should be modifiable at any time. Macros are essential because they allow you to automate processes, and eliminate keying errors.

Check the run-time options available in the standard reports. Record selection, calendar, horizon, break fields, weight fields, scale factor, print formats, and destination are most useful. The option of having a wide variety of standard reports is important, and a report writer is imperative. How can someone who doesn't know your business decide what you need?

Flexibility shouldn't require modifying the source code. When you touch the source code, your system becomes an orphan. You can't upgrade to new releases without redoing all your changes, eliminating product improvements. If offered the source code, ask what essential flexibilities are missing.

Petrolite, a manufacturer of specialty chemicals for the oil and gas industries, uses the *PRISM* system. While the system did have locations within its database to upload results from another system, it wasn't as flexible as they desired. Gary Pohl, materials planning manager for Petrolite, made the decision to install a separate forecasting package. As they learned how to forecast, they found their needs changing. "We've added 20 PART fields and 30 to 40 SKU (stock keeping unit) fields over time. We use them in the standard reports and in the ones we've written with the report writer, producing a wealth of information tailored specifically to our needs," Pohl states.

Component safety stock

Component safety stock refers to the ability to keep safety stock at some other level than at the finished goods level. For example, the electronics manufacturer mentioned earlier makes many finished goods from a smaller number of standard components. Time to do the final assembly is relatively small, while lead times on the components—coming from an overseas vendor—are very long. The company must ship quickly from stock, so it's essential to have some finished goods safety stock. But major savings can be achieved if most of the safety stock can be held at the component level.

Unfortunately, there usually is no basis for computing component safety stock because the forecast errors are at the finished goods level, not at intermediate or raw material levels. Some systems have the ability to translate the forecast errors—via the bill of materials—from the finished goods level to any lower level, allowing computation of accurate component safety stocks.

Pohl views this as a major advantage over the ERP approach in the chemicals business. In his case, "final assembly" is actually packaging, but the lead time relationships are the same. It's like going into battle with some of your troops in reserve, ready to jump in where the line falters.

Interfacing

Understandably, many ERP users are concerned about the cost of interfacing with a forecasting and planning system. They fear that hooking two systems together will be time consuming or expensive. In practice, however, it's about as difficult as replacing one brand of tires with another, and with forecasting, unlike other functions, the data doesn't have to be transferred very often. Additionally, the forecasting system should allow for flexible, user-modifiable interfaces in both directions, without any programming.

The aforementioned electronics manufacturer running Manman X said that sending output from his ERP system to their forecasting package was "a no brainer," and that the interface in the other direction was only slightly harder, mostly due to internal organizational issues.

Behr described the interface between their forecasting system and his former Cullinet system as "straight-forward and easy."

Cost

Is it reasonable to expect that more capable forecasting and planning packages will be more expensive than modules offered as options with ERP packages? Not necessarily. Ron Schroder, president of Inventory Solutions Inc., Akron, Ohio, says "there is no relation between what you pay for a forecasting system and what you get." Schroder believes the best forecasting package is not necessarily the most expensive. Likewise, the worst package is not necessarily the cheapest.

While this is good news to educated buyers, it means buyers need to be educated. High price is not a good faith guarantee of a superior product. Wilbur noted that his forecasting and planning system was actually less expensive than the forecasting module that was originally designed to run with his system.

Timing

So, you've decided to go with depth and install a forecasting and inventory planning system to talk to your new ERP system. Which do you install first?

Consider it from the cash flow perspective. Installing ERP involves virtually everyone in your business. First there is documentation of existing business practices, then education and training, developing new procedures and, finally, operating both systems until you are ready to switch over. Cash flow is negative from day one and becomes more so for the first year or two (or more).

When you install a forecasting and inventory planning system, only a few people are involved—often just one or two—which means training happens quickly. You usually discover you have too much inventory for most products and not nearly enough for a few. Managing this situation means you show a large positive cash flow on the project from the beginning. Some companies even use these savings to fund their ERP project.

The alternative occurred at a mid-sized chemicals and plastics manufacturer that installed both simultaneously. After going through on-site forecasting training, they told their forecasting vendor they were just completing their ERP installation, and would get back with them regarding the forecasting and inventory planning system. That was seven years ago. Learn from this company's mistake; do the forecasting and inventory planning installation first.

Conclusion

The experiences of the companies mentioned above prove there are certain critical decision support systems that are too important to be left only to ERP packages that supposedly will solve your every need. Large ERP systems excel in covering a wide spectrum of applications and making them all talk to each other. But getting any real depth in any one area is often lacking. Installing an in-depth forecasting solution, however, usually yields substantial benefits, and fortunately, it's not much more difficult than changing tires.

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