

# STRATEGIES

## ERP

# Enterprise Resource Planning: Strategies not included

*ERP systems can cost a fortune, take years to install, force the changing of basic business processes, and not provide a return for years. So why are so many companies buying them?*

By Tim Minahan

**B**y now, nearly everybody has heard about ERP. Short for Enterprise Resource Planning, this software has become the gee-whiz technology of the decade by promising to link huge, disparate, and often outdated business computer systems—such as those used for accounting, sales, manufacturing, and materials management purposes—to facilitate the smooth flow of information across an entire organization.

Big-name companies, such as Compaq Computer Corp., Alcoa, and Hershey Foods, say ERP systems have helped them reduce inventories, shorten cycle times, lower costs, and improve overall supply chain management practices. Such results have made household names out of leading ERP providers, such as SAP AG, Oracle Corp., PeopleSoft Inc., J.D. Edwards Co. and Baan Co. (See sidebar, Page 126.) They've also set off a frenzy for ERP software among some of America's largest companies.

According to a recent Booz-Allen & Hamilton study, more than 70% of *Fortune* 1000 companies have either begun implementing an ERP system or plan to do so over the next few years. Smaller firms are

expected to adopt similar plans as prices for ERP packages drop and larger OEMs start demanding that suppliers be ERP compliant.

This shift will require procurement professionals to have a comprehensive understanding of what an ERP system is, what it offers, and what its limitations are. Purchasing pros must be prepared not only to help select the

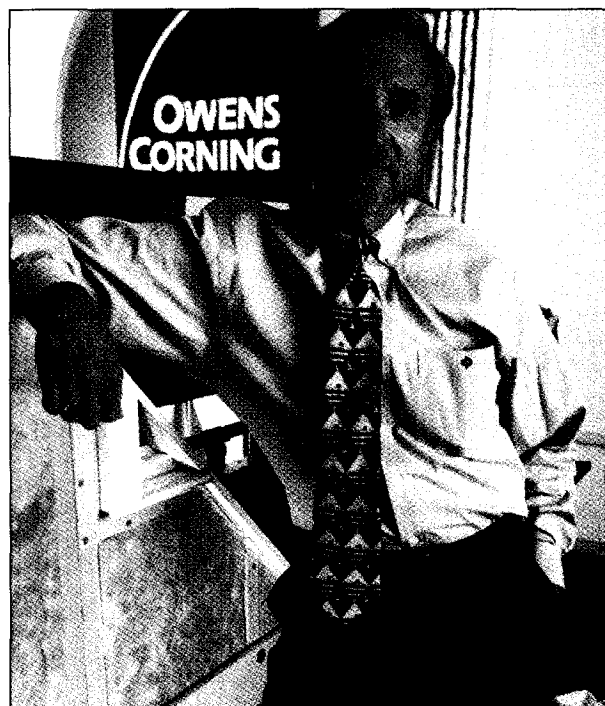
appropriate ERP solution for their companies, but also to play a vital role in defining how this solution will support their companies' overall supply management strategy.

### What's an ERP?

On the most basic level, ERP is a complex software system that ties together and automates the basic processes of business—from taking customers' orders to monitoring inventory levels to balancing the books.

Buyers should think of an ERP system as an automated record keeper or spreadsheet that can tally up company resources—such as raw materials and production capacity—and commitments, such as orders, regardless of whether the data is inputted through an accounting, manufacturing, or materials management system. ERP software accomplishes this task by digitally recording every business transaction a company makes, from the issuance of a purchase order to the consumption of inventory, and continually updating all connected systems to reflect each transaction.

This integrated approach provides all users, from company CEO to buyer at a remote plant, with a single, real-time view of their company's avail-



**SAP/R3 will help Owens-Corning consolidate purchases and cut inventories in half. However, Dennis Sheets, sourcing manager for insulation and roofing systems, says such results will not be possible without retooling business processes.**

able resources and commitments to customers. For example, if a salesman logs a new order into his laptop computer on the road, the transaction flows through the company, alerting the procurement system that parts need to be ordered and telling the manufacturing system to reserve a spot in the production queue for the newly ordered product.

David Caruso, director of enterprise application research at Advanced Manufacturing Research (AMR) Inc. of Boston, describes ERP systems as "a transactional backbone" that gives companies access to the information they need to make more knowledgeable decisions or to fuel more task-specific applications, such as electronic commerce or supply-chain planning software.

For purchasing, ERP systems can tie together formerly disparate inventory, order, and procurement systems, helping procurement organizations consolidate buys, reduce inventory on hand, and implement sourcing strategies companywide.

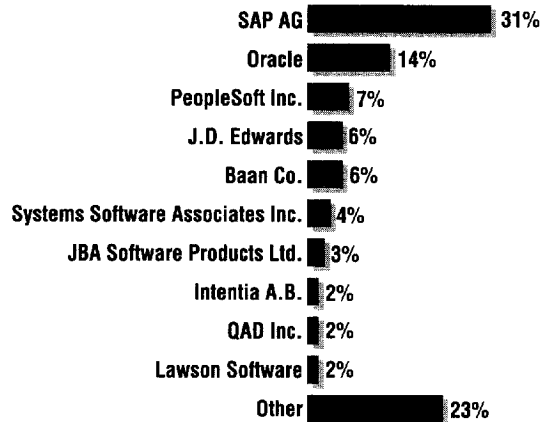
The appeal of such integrated information systems was what drove Owens-Corning to implement SAP R/3 companywide.

"The primary intent with SAP was to totally integrate our business systems on a global basis so everyone was operating on the same platform with the same information," says Dennis Sheets, sourcing manager for the Toledo, Ohio-based manufacturer's insulation and roofing systems business. He expects R/3 to give Owens-Corning the information it needs to implement a centralized purchasing strategy.

"Prior to SAP, we were buying widgets all over the world without any consolidated knowledge of how much we were buying and from whom," says Sheets. He says purchases within the insulation division were made by buy-

### SAP dominates ERP marketplace

(1997 marketshare)



SOURCE: ADVANCED MANUFACTURING RESEARCH INC.

ers at more than a dozen plants. "Now [with SAP in place] we can find out exactly how many widgets we're using, where they're being purchased, and how much we paid for them. Having this information will allow us to consolidate the overall acquisition process. We can leverage the information to make better business decisions and better buys."

In addition, Sheets expects R/3 to help Owens-Corning's insulation group reach its goal of reducing materials and supply inventories by 25% this year. Sheets's group has already cut stocks by \$2.5 million. "This

would have been more difficult without the [SAP] system in place," says Sheets.

### Why all the fuss?

If ERP is so great, why has it taken corporate America so long to embrace it? There are two overlying reasons. One has to do with technology, while the other reflects a radical shift in the way companies have come to view the supply chain.

On the technology front, businesses traditionally compiled, stored, and shared information on mainframe-based computing systems, which often ran proprietary and home-grown applications. These systems could handle huge amounts of data, but they were costly to run and offered little flexibility and even less opportunity for integration with other systems. As a result, companies began moving to a client-server computing architecture, which, using a server linked to a network of PCs, disburses computing power across a company and provides users with access to company-wide information. On one level, ERP is simply the next logical progression in this business computing trend.

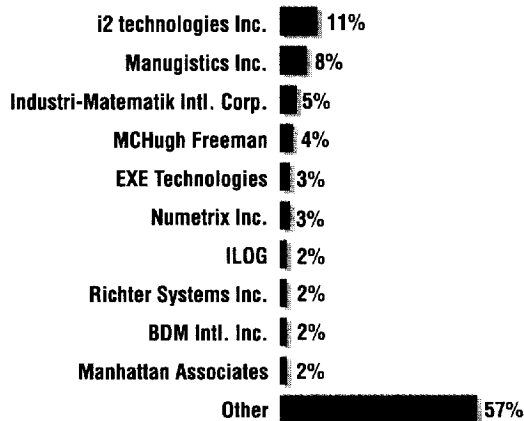
For example, Chevron Corp. decided to implement ERP solutions from SAP and J.D. Edwards at its more than 20 operating companies as part of a larger effort to update its antiquated computer systems.

"At the time, we had multiple systems that didn't talk to each other," says Theresa Silva, a senior analyst in the San Francisco-based gas company's corporate purchasing strategy group. "We were making a migration from a mainframe-computing environment to a client-server environment, so the opportunity presented itself to take a look at a corporate-wide [ERP] system."

Chevron, which began installing ERP solutions in 1992, expects to have the systems up

### A diverse supply chain software market

(1997 marketshare)



SOURCE: ADVANCED MANUFACTURING RESEARCH INC.

and running at all major sites by the end of this year. Silva says the ERP systems will act as "a central repository for information on contracts and suppliers," allowing Chevron's purchasing group to "leverage dollars across suppliers and across operating companies."

The looming and much-publicized "Year-2000 problem" is also driving companies to implement ERP systems. Thanks to a two-digit coding convention used to signify years in most software programs (e.g. "98" for 1998), the Y2K bug threatens to cripple industry at the end of the millennium as the world's computerized devices—from accounting systems to machining tools—automatically default to January 1, 1900.

This problem can be fixed through a labor-intensive process. But, with millions of lines of software code needing correction, many companies have found it easier and more cost-effective to completely overhaul their corporate systems by implementing a Year 2000-compliant ERP solution. In fact, consulting house Morgan Stanley estimates that companies looking to ERP as a Year-2000 solution account for 15% to 20% of current sales.

Probably the leading reason companies are adopting ERP is because they have to. The new global and highly-competitive business environment

demands it.

"Companies today are being pressured to reengineer their critical supply chain business processes," says R. Michael Donovan, president of R. Michael Donovan & Co. Inc., a management consulting firm based in Natick, Mass. "This requires eliminating many non-value-added activities and creating a leaner, quick response order-to-delivery process. It also requires companies to implement systems, such as ERP, to provide the information flow necessary to support such activities."

ERP is an effective tool for supporting today's supply chain and business strategies. However, it is by no means a strategy itself.

### Strategy not included

"The biggest mistake companies make is that they think, 'If I buy this big software package, it will fix my problem,'" says Mark Orton, assistant director of the New England Supplier Institute (NESI) in Boston. "Unless a company does a lot of thinking about what its supply chain strategy is and articulating what its business processes are, these tools are going to be of little use."

Indeed, analysts and users say the leading reason ERP implementations fail is that companies attempt to automate existing redundant or non-value-

added processes. "To simply take your current practices and duplicate them in an integrated system like ERP would be costly and probably reduce the benefits of the system," says Gerhard Wittreich, project manager for the procurement piece of DuPont & Co.'s mammoth effort to migrate its 100 business units to SAP R/3. "You need to reengineer your processes up front and decide how you might do business differently in an integrated environment. Chances are, you'll identify new business practices you couldn't even think of before."

DuPont has broken its business down into various processes, such as sales-to-cash, and developed cross-functional teams of operations and technical personnel to determine how these processes should best be run in an integrated environment.

Witco Corp., a Greenwich, Conn.-based specialty chemicals producer, took a more dramatic approach to ERP: It rebuilt its business from the ground up before installing the first megabyte of software.

Bruce G. Davis, vice president of purchasing and logistics, says years of acquisition and growth had left Witco with a host of diverse businesses, each using different processes and computer systems. "In our case, there were so many business processes out there that we started redesigning

## Who are these guys?

**N**early two-thirds of the enterprise resource planning (ERP) software market is controlled by these five providers:

**SAP:** SAP AG has emerged as the dominant leader in ERP, commanding a whopping 31% of the market. In fact, in most business circles, the Walldorf, Germany-based company's name has become synonymous with ERP, like Scotch tape or Q-tip have for certain consumer products. SAP's R/3 software package is a favorite among big users.

**Oracle:** The leading provider of relational database management systems, Oracle Corp. is a distant second in the ERP race, commanding 14% of the mar-

ket. The Redwood Shores, Calif.-based company takes a modular approach to ERP, offering separate applications, such as Oracle Financials and Oracle Manufacturing, that use common computing tools. The complete package, known as Oracle Applications, is also available.

**PeopleSoft:** Founded in 1987 as a provider of human resources software, PeopleSoft Inc. has expanded its offerings to become a leading ERP provider. Controlling 7% of the ERP market, the Pleasanton, Calif.-based company offers Enterprise Solutions for financials, materials management, distribution, and manufacturing.

**J.D. Edwards:** Established in 1977 to develop software for small- and medium-size computers, J.D. Edwards & Co. has quickly advanced in the ERP ranks. The Denver-based company offers users a total ERP solution in World (AS400 based) and One World (client-server based) or a process-based solution with modules for areas such as finance, manufacturing, and logistics/distribution.

**Baan:** Expanding its offerings through a host of recent software company acquisitions, Baan Co. offers ERP solutions as individual applications, such as manufacturing, finance, and distribution/transportation, or as a complete package, known as Baan IV.

# STRATEGIES

them from scratch," says Davis.

Through a companywide initiative dubbed Project EDGE (Enterprise Design for Global Excellence), Witco established cross-functional teams to focus on five distinct business processes: order fulfillment; asset effectiveness; purchasing and materials; planning and control processes; and financials. (Separate technical and "change management" teams were established to work across these five areas.) The goal: To redesign and consolidate key processes, such as supplier management, as well as integrate disparate computer systems across Witco's four global businesses and 11 strategic business units.

Witco will begin implementing SAP R/3 in its organosilicones business next month. The system will be rolled out to other business units in North America, Europe, and Asia in future months. Davis says R/3 will help the company improve its key processes: "From a purchasing perspective, what we're after is supply chain integration, better forecast accuracy, and the ability to work with suppliers in a connected way."

Owens-Corning's insulation group went through a similar operations redesign prior to implementing SAP R/3. The company moved buying decisions from the plants to a regional level where sourcing decisions are made by one of three commodity groups: chemicals, batch, and packaging.

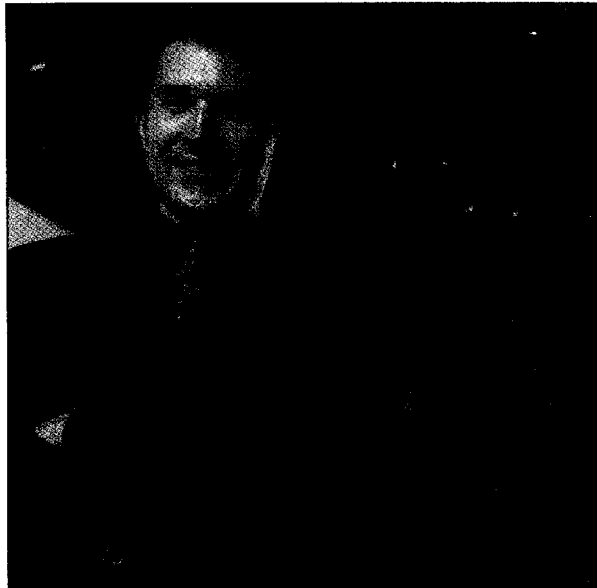
"Now we have commodity specialists who focus on a particular commodity grouping, enhancing their expertise and knowledge of the products they buy and leveraging our position with the supplier base," says Sheets.

In addition, Owens-Corning established cross-functional teams to identify, map, and rethink major business processes and how these processes intersect.

"We had to identify the handoffs and touch points between various

functions," says Mike Morey, MRO commodity leader for the company's insulation group and the sourcing leader for the division's ERP implementation project. "My team, for example, had accountability for the process that runs from the time we need to buy something through the payment issuance to the supplier. Other areas, such as logistics and accounting, touch this process."

Owens-Corning also met with suppliers throughout the process to bring them up to speed on how the ERP implementation would affect the supply base. Morey says Owens-Corning requires suppliers to have electronic-data-interchange capability. That way



"Business units had to have their processes up to a certain level before they could implement an ERP system," says Lee Garbowitz, director of corporate sourcing for AlliedSignal Inc.

information received from suppliers is already in digital format and can be fed directly into the R/3 system.

AlliedSignal Inc., a Morristown, N.J.-based aerospace, automotive, and engineered materials manufacturer, used cross-functional and cross-business unit teams to ensure that the ERP solution it selected would support its long-term business strategies.

"One thing we recognized is that you don't want ERP to be an information systems project," says Lee Gar-

bowitz, director of corporate sourcing and manager of information systems procurement. Instead, the \$14-billion conglomerate, which eventually selected SAP's R/3 solution, designated ERP implementation as a process to be accomplished under its Six Sigma quality program, which aims to yield just 3.4 defective parts per million produced.

"We made it clear to the strategic business unit (SBU) leaders that they had to have their processes and capabilities up to a certain level before they could implement an ERP system," says Garbowitz.

Indeed, each of AlliedSignal's eleven SBUs must justify why they need an ERP system and how it fits into their overall strategic business plan before they even receive funds for implementation. This is not just a cursory exercise. CEO Larry Bossidy personally reviews each proposal before allowing a business unit to implement SAP.

## Big bucks, slow ROI

ERP doesn't come cheap. Like most software, ERP is priced based on the functionality of the system needed and the number of "seats" or users who will access it. These systems may also require companies to convert data, tweak existing systems, and overhaul networking infrastructure. In addition, the complexity of ERP (and the threat of a failed installation) generally

demand that companies hire a cadre of consultants and technical gurus whose fees can run as high as five to 10 times the price of the software.

All this can add up quickly, with top-of-the-line ERP software packages costing tens of millions of dollars. Chevron alone has spent nearly \$160 million implementing ERP solutions over the past five years.

"It's not unusual for the big, complex deals to be \$50,000 to \$75,000 per concurrent user," says Chris Jones, vice president and research director

for the manufacturing and logistics division of The Gartner Group, a Stamford, Conn.-based research house. Jones emphasizes that the cost of ERP installations can vary by more than 20%, depending on the scope and complexity of the installation. "However, to say a typical ERP installation is never less than \$25,000 per concurrent user is probably not true."

Another gripe about ERP systems is that they're difficult to install. The typical ERP implementation takes between two and three years. Larger, more complex installations can stretch to five or six years. In addition, most of these systems aren't very user-friendly, requiring companies to spend significant time up front establishing rules for using the system and training employees to follow them.

"[ERP] provides you with this great data warehouse system," says Chuck Beck, vice president of global materials and sourcing for Colgate-Palmolive, which is implementing SAP R/3 as part of its global, supply chain management initiative. "The data is in there, but there's this excruciatingly painful effort to make sure that what you pull out is what you need."

To do so, Colgate is developing companywide rules for inputting data into the SAP system as well as formatting reports to get the most useful information from the system. "We're doing this

on a division-by-division basis," says Beck. "We're trying hard to coordinate it so we don't have a separate [data] warehouse for each division."

When implementation is complete, Colgate's materials group will be able to use the system to quickly retrieve transactional data, summary reports on particular commodities, and performance, contract, and pricing information on specific suppliers.

Owens-Corning took similar care to train its people to use ERP. In fact, the company, which schooled personnel on how to properly input data into SAP and use various modules, expects nearly 13% of its total implementation budget to go to training.

"Our people weren't given access to a particular [SAP] module until they completed the certification and were authorized to access it," says Sheets.

For their part, many ERP providers now offer slimmed-down solutions that have lower price tags and don't require much assistance to implement. J.D. Edwards, for example, is selling versions of its ERP software through Ernst & Young Technologies Inc. that target companies with revenues between \$200 million and \$2 billion. J.D. Edwards also sells low-cost, easy-to-implement solutions for companies with revenues of \$100 million or less through a network of computer resellers. Other providers, such

as JBA International Inc., focus exclusively on companies in the \$100 million to \$1 billion bracket.

Also, ERP providers, who once gave little thought to the different supply chains and business practices at work in various industries, are beginning to shed their one-size-fits-all mentality, tailoring new products to meet the needs of vertical markets, such as automotive, electronics, or chemicals.

For example, Baan offers ERP solutions tweaked for eight distinct industries, including electronics, automotive, aerospace, and specialty chemicals. Some smaller ERP providers specialize in certain markets, such as QAD Inc. which has designed systems for the process industries.

"Procurement in the chemical industry is different because buyers have to deal with grades, potencies, bulk lots, etcetera," says George Gulliford, product marketing manager for logistics at J.D. Edwards, which offers ERP solutions geared to 17 different vertical markets. "By contrast, a buyer at a manufacturer is concerned with parts that are manufactured by his own company or by an outside source."

AlliedSignal plans to use SAP's R/3 as its core, however, each SBU will install the version of the software that

## Seven steps to better ERP

- 1. Look at yourself.** The ultimate goal should be to improve your business—not to implement software. Use cross-functional teams and executive-level input to identify, examine, and rethink existing business processes. Benchmark these processes against those used by the best in your industry.
- 2. Plan ahead.** Establish business goals. Map out a strategy for getting there. Reengineer existing business processes and/or develop new business processes to support the strategy.
- 3. Prove you need ERP.** Spell out how an ERP system will support overall business strategy and how it will work with your new business processes. If you can't

make a case for ERP, you probably don't need it.

- 4. Choose partners wisely.** Select the ERP provider that's right for your business needs, not the one with the most popular name. Talk to existing users, especially those within your industry, about what they like and dislike about their ERP systems. The same rules apply when hiring consultants. Choose only those who understand your business as well as ERP technology.

- 5. Pick the best man/woman for the job.** ERP implementation is tricky. Consultants can help, but no one knows your business like your own people. Stock implementation teams with your company's smartest

workers. A good rule: If an operation can't run without a particular person, you want him on the implementation team.

- 6. Start off slow.** A good ERP implementation can help a company run smoother. A bad one can shut a company down. Install ERP on a rolling basis, starting with small but highly visible business units first. Lessons learned can make the rest of implementation run smoother. Early successes will help get buy-in from the executive suite and the plant floor.

- 7. Change everything.** ERP will open your eyes to information and processes you never thought possible. Be flexible enough to change the way you operate over and over again.

# STRATEGIES

relates to its vertical industry, whether it be aerospace, automotive, or chemicals.

"There's going to be a common set of products and a common set of coding," says Garbowitz. "Then there's going to be additional modules that are tailored to the specific industry that the SBU is in. The goal is to achieve commonality without shorting the business demands of the individual business units."

## MRP for the real world

Despite all the hoopla surrounding ERP, the fact remains that early versions of these systems didn't actually *do* much. Users found that, while ERP compiled vital information into a single, companywide system, these solutions lacked functionality in key areas, such as transportation planning, inventory management, shop floor

control, and electronic commerce.

This gap has spawned a new breed of software, known as supply chain management software, the most popular of which is Advanced Planning and Scheduling (APS) applications from companies such as i2 Technologies Inc., Manugistics Inc., and IMI Corp. These supply-chain planning applications "take in the data from ERP orders or past sales history and create forecasts to help you plan your demand," says Michelle Silvers, marketing manager at Logility Inc., an Atlanta-based APS provider.

APS packages, which "bolt-on" to an ERP system, are the next-generation of material requirements planning (MRP) technology. MRP and its successor, MRP II (Manufacturing Resource Planning), promised to bring better control and order to the manufacturing floor. However, both

systems operated under the assumption that companies have an infinite amount of manufacturing capacity, labor, and time.

"The schedules that came out of [MRP and MRP II] systems were not fact-based schedules," says Donovan. "They made illogical assumptions, such as production queue times are fixed when, in fact, queues are quite elastic and can change on any given day."

Indeed, many MRP and MRP II users report keeping safety inventory on the floor and posting daily "hot lists" for high-in-demand materials and parts.

APS software, on the other hand, takes into account the constraints of real-world manufacturing environments, allowing buyers, materials managers, and production planners to develop realistic schedules that can fulfill new orders with existing resources.

## SOFTWARE DATA FILE

### Enterprise Resource Planning

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# STRATEGIES

"APS systems provide the capability to simulate what is going to happen in the future," says Donovan. "You can start asking a scheduling question of what would happen if you did a particular [production] run. You can see problems and bottlenecks, change your approach, and re-simulate until you get a solution that works."

Eastman Chemical Co., a \$4.8-billion producer of chemicals, fibers, and plastics, uses Logility's Value Chain Solutions suite over its company intranet to improve forecasting and inventory control.

Similarly, Chevron is working with Ariba Technologies Inc., a Sunnyvale, Calif.-based software company, to develop more extensive and user-friendly electronic commerce capabilities than those provided by its current SAP and J.D. Edwards ERP systems.

"SAP is not the most user-friendly application," says Silva. "Its materials management module wasn't designed

for the occasional user."

By contrast, Ariba's Operating Resource Management System functions much like the World Wide Web and can be retooled, if necessary. Silva says such functionality will help Chevron attain its goal of conducting 98% of transactions for production goods and services electronically.

"We'll be using SAP [and J.D. Edwards] almost as a database to support the electronic commerce application," says Silva. "The [Ariba] system will be so easy to use that I wouldn't be surprised if we could roll it out with only an instructional pamphlet, saving us significant training costs and improving usage levels."

ERP makers are catching on. PeopleSoft was the first large ERP provider to integrate supply chain planning and optimization and technology into its core products, snatching up Red Pepper, a leading provider of demand-forecasting software. Ora-

cle has made Manugistics a partner. SAP, which originally teamed up with i2, has developed a supply-chain planning solution of its own, called SCOPE. And Baan recently unveiled its first generation of supply chain management applications, called Baan Sync.

There's no doubt that these new supply-chain planning offerings will make ERP systems more useful, allowing companies to coordinate production with demand, slash inventory and cycle times, better manage logistics, improve customer satisfaction, and reduce overall costs. However, ERP, APS, or any other software solution is not a silver bullet. Instead, these technologies are best used as tools to support an overall supply chain or business strategy.

"The real need is for companies to analyze their business processes first, then implement the ERP and supply chain software tools that will support those processes adequately," says Donovan. ■

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