While the red-hot pace of the logistics/supply chain IT market may have cooled somewhat, there's still plenty of spark. Check out the latest IT applications for purchasing, order and demand management, supply chain planning, transportation, and warehousing.

LOGISTICS IT

HEAT

TURNING | UP THE

After a year or two of cooling off, the logistics/supply chain information technology market may be heating up again. "Supply chain software sales will grow by 15 to 20 percent in 2002, and should approach the $7-billion mark," write David O'Brien and Gerald McNerney in AMR Research's *Report on Supply Chain Management.*

More than two-thirds of respondents anticipate making additional investments in supply chain technology - 69 percent during the next year, and 68 percent during the next three years - the report says.

They're not alone. Twenty-four percent of respondents to a survey conducted by CS Report Inc. project a boost in spending this year for supply chain technology, with 58 percent saying such spending will be the same as last year.

Whether or not these figures hold up, plenty of companies are investing smartly in a full range of planning and execution systems. Here's a look at some hot logistics and supply chain technologies.

PURCHASING SOFTWARE: MANAGING THE FRONT END

"The world of purchasing software took a sharp detour over the past few years as traditional software providers suddenly found themselves competing against the new kids in town the B2B exchanges," observes Marc Wulfraat, managing partner of **Kom International**, Montreal, a supply

chain consulting company.

"The exchanges threatened to change materials management forever as goods and services would be purchased through the Internet and Intranet-based exchanges," he explains. While it seemed as if such exchanges would eclipse more traditional systems, the bursting of the dot-com bubble changed things dramatically. "As B2B exchanges struggle to rebound, traditional purchasing and forecasting software solutions continue to be successfully implemented," Wulfraat notes.

Some exchanges have managed to survive. Premier Inc., a healthcare group purchasing alliance owned by more than 200 hospitals and healthcare systems, recently awarded a contract to Verticalnet Inc. for its collaborative supply chain solutions. The software will help Premier facilitate online contract management for the alliance's members and supply chain partners to reduce the time and administrative effort required to negotiate and activate group purchasing contracts.

When it comes to managing the front end, whichever procurement and supplier management solutions are used, it's likely that the technology will leverage the power of the Internet, as these examples show:

■ Last August, oil and gas giant Unocal began implementing the hosted version of Perfect Commerce Inc.'s *Perfect Sourcing* solution. The solution enables end users at Unocal

to automate and manage the complete sourcing process. This entails creating standardized bidding templates, generating requests for quotations, evaluating bid responses, and awarding the bid. Unocal is integrating the sourcing solution into its Oracle *iProcurement* buying tool, which will enable the sourcing process to automatically move into Unocal's buying (and, ultimately, invoicing processes), further streamlining the overall operation.

■ Telecommunications provider Verizon has rolled out the *Ariba Buyer* procurement solution to more than 215,000 users throughout its U.S. locations. Called PEG@S, the Ariba-powered solution has helped Verizon significantly improve supply and services procurement management. It electronically aggregates enterprisewide spending from user desktops and directs the spending to preferred suppliers.

The solution, which is integrated with Verizon's ERP systems, is being used in 10 different commodity categories, with additional ones being added each quarter. Verizon also uses *Ariba PunchOut,* a technology that allows the user to "punch out" to or seamlessly access a supplier's web site via the Ariba Supplier Network, then return to the *Ariba Buyer* solution to complete the purchase.

■ Trilegiant, a membership provider of a wide range of services, early last year began establishing electronic connectivity with the 80 percent of its vendors who were doing 30 percent of the volume. Such seamless connectivity is crucial for Trilegiant, which carries no inventory -vendors ship direct to consumers.

Trilegiant today works with its suppliers through SPS Commerce's hosted e-commerce solution. All of Trilegiant's order transmissions are sent to SPS via several flat files each day. Suppliers have the option of how to exchange information with SPS, reports Evan Guttman, vice president of retail operations for Trilegiant.

"The suppliers' VAN can talk with SPS's communication medium. Suppliers also can use the web-based ecommerce option, exchange a direct application file with SPS, or still use a fax solution," Guttman says. Regardless of what communications method a supplier uses, Trilegiant receives everything electronically from SPS.

Automating its medium and small suppliers has paid off handsomely for Trilegiant. "We see a 25-percent reduction in non-shipped orders," Guttman says, and suppliers have shaved a day and a half off order cycle time. As a result, Trilegiant is able to quote shorter lead times than last year, and, Guttman notes, "we exceed customer expectations more often."

Trilegiant is now working on shifting its return authorizations and processing to SPS. Consumers will send returns directly to vendors, rather than to Trilegiant. Using the automated returns tool, vendors will communicate electronically with Trilegiant, streamlining the entire returns process significantly.

ORDER MANAGEMENT DEFINING COMPETITIVE ADVANTAGE

"Order management software systems are mission-critical applications that in many ways define the competitive advantage of a company. They incorporate order entry, item look-up, pricing, promotions, rebates, discounts, accounts receivable, inventory allocation rules, product substitution, product aliases, selling restrictions, customer prioritization, upselling techniques" and more, notes Wulfraat.

The ability to handle distributed order management will be increasingly important for companies operating in a multi-channel environment, according to David L. Anderson, manager of the supply chain practice at Accenture, Boston. "Distributed order management means handling orders that are being taken across a variety of new channels," Anderson explains.

These systems make it possible to serve top customers intelligently no matter what channel they use. For example, a distributed order management solution can enable a company to make sure that a key customer's order received over the web gets the same VIP treatment it would get coming in through traditional channels.

"Distributed order management sets the right priorities, then drives them into the supply chain, in a much different manner than traditional order management systems can do," Anderson says.

School Specialty Inc., a direct marketer of supplemental education supplies, is one company implementing such a solution. It is deploying management applications from Yantra Corporation, including its *MultiEnterprise Order* solution, to automate order capture and management across multiple channels and divisions.

The Yantra. applications will manage all sales orders, both cross-channel and divisional, based on userdefined business rules and fulfillment paths. The solutions will enable School Specialty to dynamically allocate and ship orders from the most costeffective points in its extended distribution network, which includes eight distribution centers and 500 drop-ship suppliers.

The solutions will also give School Specialty - which has acquired 38 companies over the last 10 years the capability of adding new order capture points, so it can assimilate new channels and acquisitions quickly while maintaining unique order processing rules.

DEMAND MANAGEMENT: SWEET MUSIC

Four out of 10 manufacturing respondents (41 percent) are considering investing in demand planning and forecasting tools, according to AMR Research. That's compared to 32 percent of wholesalers, retailers, and distributors.

Fender Musical Instruments Corp., for example, began using demand solutions

What Software Solutions Have the Greatest Effect on Business?

BUSINESS BENEFITS	IMPORTANCE TO ROI	DEMAND PLANNING & FORECASTING	PRODUCTION SCHEDULING	SUPPLY CHAIN PLANNING	TRANSPORTATION MGMT.	WAREHOUSE MGMT.	ORDER MGMT.
Inventory Costs	70%	35%	16%	32%	16%	5%	7%
Reduction in Cycle Times	62%	20%	16%	13%	3%	17%	23%
Improved Fill Rate	59%	11%	5%	5%	7%	5%	7%
Improved Production, Shipment and Delivery Data to Customers	58%	82%	90%	57%	72%	69%	82%
Transportation Costs	49%	11%	7%	11%	19%	14%	7%
Warehouse Operating Costs	44%	8%	7%	14%	6%	19%	14%
Plant Utilization	44%	8%	2%	3%	3%	6%	5%
Manufacturing Cycle Times	43%	20%	16%	13%	3%	17%	23%
Reduced Manufacturing Overhead	40%	10%	12%	19%	14%	23%	16%
Collaboration	33%	32%	21%	24%	18%	11%	30%

Most effective in driving business benefit   Second-most effective in driving business benefit

Source: AMR Research, 2002

Herman Miller Drives Down Transport Costs

International office furniture giant Herman Miller moves its outbound domestic truckload and LTL shipments via a private fleet and multiple contract carriers. As part of its strategic supply chain initiative, the company is integrating order processing, WMS optimization, and mission-critical fulfillment.

One tool it uses is LeanLogistics Private Transportation Marketplace, which electronically tenders shipments to its core carriers and enables it to see carrier capacity at all times. "We view e-marketplace technology as an opportunity to create cost savings and process improvement," notes Kevin Tibbetts, Herman Miller's director of logistics.

"The LeanLogistics Private Transportation Marketplace gives us the ability to make spot purchases within a qualified environment that is consistent with our strategy of driving costs out of the system while strengthening our relationship with existing supply chain partners," he says.

Herman Miller uses the spot marketplace as part of a threepronged transportation strategy, Tibbetts explains. Round-trip moves go to the furniture company's dedicated fleet. A certain amount of traffic is reserved for Herman Miller's partnership carriers. "We picked some carriers who give us very **good** service and highly competitive rates, and told them they can count on certain loads to specific destinations, so they can build backhauls around them," he says.

Other traffic is put on LeanLogistics' private spot market. "We'll put out a load with all the parameters how large a load it is, origination and destination, pickup and delivery details-- and get anywhere from 10 to 25 bids on that a load," Tibbetts says. This approach saves the company between five and 15 percent off its best contracted rates,depending on the load.

Herman Miller will also implement LeanLogistics' automatic freight payment solution. But that's just the beginning. "Eventually, we want to handle all our carrier communications through the LeanLogistics system. We will tender all our loads through it," Tibbetts says.

STAYING LEAN

"We'll still have an internal system that we'll use to build the loads, but we will build an interface so that all those loads can be downloaded into Lean Logistics," Tibbetts says. "When that happens, we'll tender our loads, even to our partner carriers, through the LeanLogistics system, and rate them. Carriers will be notified of the loads, and will have the ability to decline or accept" using the solution. Once the load moved and the transaction complete, the freight bill will be paid electronically.

Tibbetts views Herman Miller's relationship with LeanLogistics as one similar to a development partner. "That's one great thing about it. Because we're in on the early stages, we have a lot of say in developing the solution," he says.

"We're helping LeanLogistics better understand what Fortune 500 companies need. They're building it to suit our needs, and we don't have to invest all the resources to do it." Because LeanLogistics; is a hosted solution, "we provide input on our needs, and can pay as we go," Tibbetts notes.

from Demand Management Inc. in January. The guitar and amp maker needed a way to more accurately forecast sales at its companyowned facilities located in California and Mexico, and for its business partners in the Far East. The company today controls demand planning and inventory management from its headquarters in Scottsdale, Ariz. The new software has enabled Fender to cut days out of the production planning process, creating a schedule in a few minutes.

"We used to spend a lot of time calculating how to best manage our diverse inventory," says Mike Gilreath, director of management support for Fender. "Now we are finally able to spend time analyzing that output instead of just generating it, and it's more accurate than ever." The next step for Fender will be setting up collaborative planning with the company's major accounts.

## SUPPLY CHAIN PLANNING: REDUCING INVENTORY AND COSTS

Half (51%) of the respondents to the AMR Research survey are considering investing in supply chain planning modules, such as inventory and/or transportation planning *(see* chart, page 39). Reducing inventory and decreasing costs were cited as the leading reasons why companies implemented supply chain planning solutions, according to a survey conducted by management consultants PRTM.

Take Honda Express Co. Ltd.'s logistics subsidiary, One World Logistics of America, for example. One World expects supply chain planning solutions from SynQuest to reduce inbound logistics costs associated with the delivery of materials to assembly operations and outbound logistics costs associated with finished vehicle scheduling.

"For the first time, we can quickly and completely model complex inbound networks, which includes balancing transportation, inventory, plants, suppliers, and returnable containers costs, while respecting the constraints we encounter in the real world of global logistics," says Yoshi Ohara, senior managing director at Honda Express and president at One World.

"There is great complexity in a multidivisional automotive assembly operation," says Albert Wittkopp, vice president at One World. "During our pilot

Where Companies Will Invest Software Dollars

* Inventory and/or Transportation Planning

Source: AMR Research, 2002
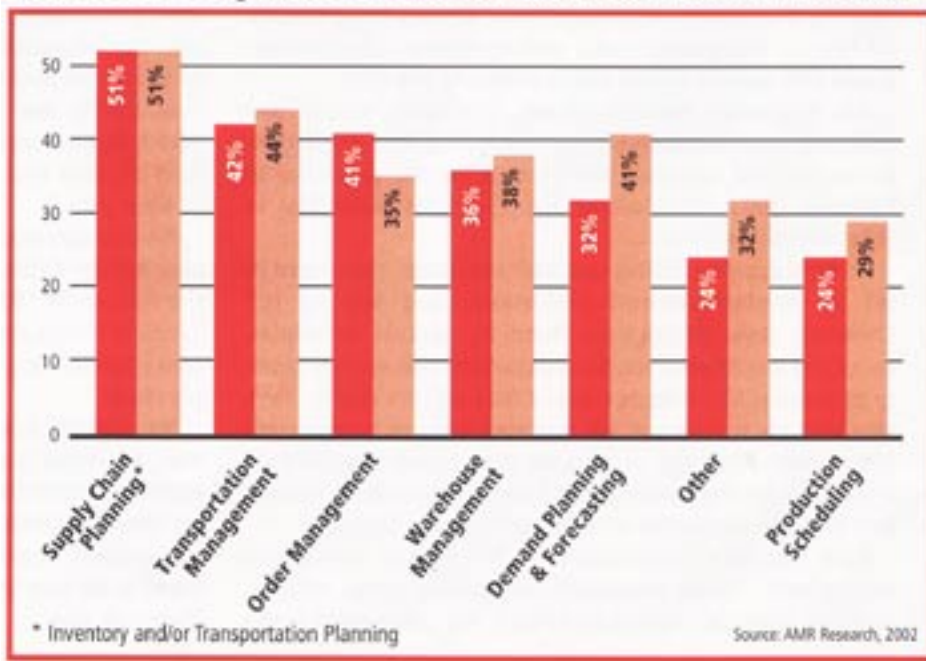
study of inbound logistics, SynQuest, in eight weeks, was able to show us better results than we could have accomplished in 40 weeks on our own." One World will also use SynQuest's finished vehicle scheduling solution to determine the most rapid, cost-effective plan for movement of finished vehicles from Honda's assembly plants to its dealers.

TRANSPORTATION MANAGEMENT MOVING UP THE PRIORITY LIST

More than 40 percent of respondents (42 percent of manufacturers, 44 percent of wholesalers, distributors, and retailers) to the AMR Research survey are considering adding a transportation management solution.

The transportation management market has basically consisted of four distinct types of solutions providers, according to Wulfraat. There has been little crossover among the four types, which include:
- small package manifesting systems
- international freight systems
- private fleet routing systems
- LTL/TL transportation planning and execution systems.

Paper manufacturer and distributor GeorgiaPacific will soon begin using one of the latter solutions, Logistics.com's *OptiManage7* transportation management system. Nearly 140 sites and thousands of end users across the country will use *OptiManage* to process an estimated 550,000 shipments annually through the system. *OptiManage* will be on site at the initial group of Georgia-Pacific plants by the beginning of the third quarter.

OptiManage will be fully integrated with Georgia-Pacific's proprietary order management system. Features include intelligent freight monitoring, appointment scheduling, shipment notifications, and webbased tracking and tracing of shipments.

Robert I Pugh, vice president of transportation for Georgia-Pacific's building products division, notes that *OptiManage's* hosted web architecture eliminates capital expenditure and enables the company to begin realizing savings quickly. In addition, *"OptiManage's* advanced event management capabilities help us control the cost of transportation. By keeping our costs low and helping us improve customer service, *OptiManage* will help us extend our marketplace advantage," he says.

TRANSPORTATION EXCHANGES GAIN NEW ACCEPTANCE

In addition to the four traditional types of transportation technologies, there's a new option available today. "Web technology has enabled the birth of a new type of solution provider that is rapidly gaining acceptance -the transportation exchange and/or private network such as Nistevo, NTE, and LeanLogistics," Wulfraat observes.

Companies with annual transportation budgets in excess of $50 million are tempted by the potential for reducing that cost by five to 15 percent, Wulfraat explains. "This can result in seven-digit savings, which can easily cost-justify the investment in this technology. In essence, transportation exchanges enable companies to tender contracts to suppliers, make spot purchases, and streamline the financial payment process through electronic payment streams." One such company is office furniture manufacturer Herman Miller *(see sidebar P.3).*

Another example is grocery retailer Hannaford Bros. Co., Scarborough, Maine, which is using a hosted solution to optimize its transportation operations and maximize usage of logistics assets.

A solution from Elogex will help manage inbound and outbound transportation and provide full visibility of inbound shipments, which can then be monitored for freight allowances and vendor compliance. Automated carrier selection and rating will streamline outbound shipments. Hannaford will also use Elogex's automated delivery appointment scheduling and direct freight settlement capabilities.

When fully implemented, Hannaford will process more than 120,000 shipments per year, creating collaborative connections between Hannaford and hundreds of carriers and suppliers. Hannaford will also use the multi-division, multi-firm consolidation engine to create continuous moves, resulting in more efficient vehicle utilization.

WAREHOUSING MANAGEMENT KEEPS GROWING STRONGER

"The warehouse management system market continues to undergo significant industry consolidation," notes Marc Wulfraat. As a result, "the strongest suppliers keep getting stronger," he says. "The top 10 uppertier solution providers have made software advances on several key fronts: integrating transportation and yard management systems, voice technology, slotting, labor productivity management and reporting, event management, and web-enabled supply chain visibility."

Spencer Gifts, a retail specialty gift chain headquartered in Egg Harbor Township, NJ., is adding the *WaView* supply chain execution collaboration suite from Provia Software to the *ViaWare* warehouse management system installed in its distribution center two years ago.

Spencer Gifts is beta-testing *ViaView* for Provia. "Wrapping *ViaView* around our current fulfillment execution products will give us both a 'now' and 'later' view of our supply chain, says Geoff Higginbotham, vice president of global supply chain logistics for Spencer Gifts.

"The 'now' portion comes from the real-time view of fulfillment throughout our distribution environment. The 'later' portion is the historic record of all transaction activity that we'll collect moving forward," Higginbotham says. "Being able to view our transaction history over an expanded time period will give us the ability to identify trends, investigate problems, and increase efficiency."

The visibility tool was installed in September 2001, at the beginning of Spencer Gifts' busy season, reports Jeffrey N. Lovelace, manager of distribution center systems for the retailer. "We put it in place to let the transactions database build up" throughout the busy Halloween and Christmas seasons. End users will begin using the system later this spring. Once the system is fully functional, the retailer's logistics staff will be able to create online reports to chart and monitor real-time distribution progress. In addition, "*Via View* will notify users when certain criteria occur," Lovelace explains. The system might notify users, for example, that a particular product is a hot seller or that another product is backordering.

The solution will be used initially in the distribution center, but the company may also choose to roll out the system to its individual store managers. This would give stores the ability to check order status or inventory levels in real time.

In addition, Lovelace says, store managers would be able to subscribe to information so that they could be notified what products are arriving, when a shipment actually left the DC, where it currently is located, and how many cartons are on the shipment, down to the SKU detail level.

YARD MANAGEMENT. KEEPING TRACK OF ASSETS

Yard management systems "help companies with sizeable transportation fleets prioritize the unloading of inbound trailers, the loading of outbound trailers, and the activities performed by yard jockeys," Wulfraat says. The benefits of the systems: asset-tracking, work prioritization, and information, all leading
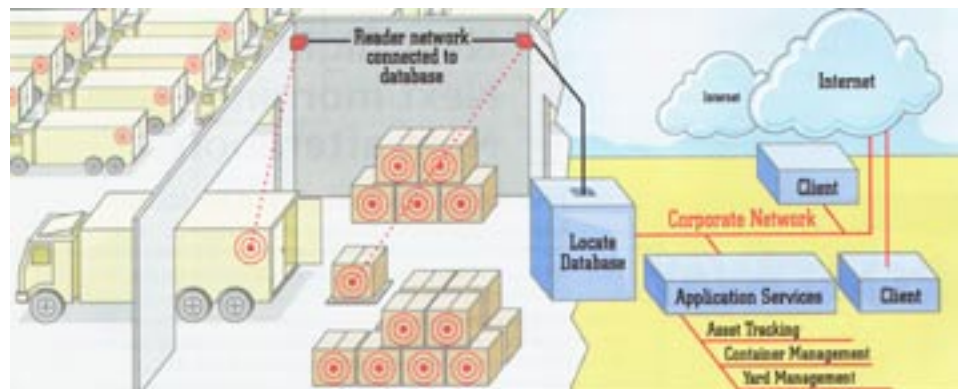
to better return on assets.

"Several leading WMS vendors have built their own YMS applications, or have 'private-labeled' and are reselling a solution developed by a standalone vendor," he says. "Today's solutions are designed to use wireless radio frequency technology to control fleet assets in real time once the trucks have physically arrived on-site."

Meijer Inc., a grocery and general merchandise retailer that operates more than 150 stores throughout Illinois, Indiana, Kentucky, Michigan, and Ohio, recently started using realtime locating system (RTLS) technology from WhereNet Corp. - as well as *WhereSoft Yard,* WhereNet's YMS - at its distribution complex in Tipp City Ohio.

Thanks to tags mounted on trailers, a local infrastructure of antennas, and WhereNet visibility software, Meijer is able to locate every tagged trailer to within 10 feet *(see diagram, page 42).* A centralized database, accessible to internal users and retail store personnel, makes status information visible on every type of freight. Meijer is able to eliminate manual searches for misplaced trailers. Stores know what's coming and when, and are able to schedule labor for deliveries more efficiently. Both on-site and remote users are able to make more efficient decisions thanks to visibility of real-time data.

Yard management solutions, now largely executional systems, will become more powerful planning tools in the future, predicts Wulfraat, when they gain the ability to "capture data on in-transit over-the-road trucks so that companies can plan ahead on how the truck will be utilized when it arrives."

GETTING A GOOD RETURN

How are companies such as those described in this article able to continue to invest in logistics and supply chain technological tools? The ability to get approval for investments in supply chain technology hinges on the return that will be realized from that investment.

Logistics and supply chain professionals are getting more savvy at developing compelling business cases for IT solutions. Seventy percent of the participants in AMR Research's study on supply chain software indicate that they had conducted an ROI evaluation, with the average expected ROI between 15 to 19 percent annually. And the returns are good: Eighty percent of the companies that conducted a formal ROI study "have either achieved or are on track to achieve their expected ROI on their supply chain project," write O'Brien and McNerney.

PATIENCE, EXPERIENCE BRING REWARDS

"Supply chain applications yield results, but it takes experience and time," according to O'Brien and McNerney. "Greatly improved operations in areas such as business cycle times as well as inventory, transportation, and warehousing costs are far more likely to occur in companies that have two years or more experience in using SCM systems."

The bottom line: when you are developing a business case for even the hottest supply chain technology, be very realistic when setting payback periods. Your credibility for justifying future investments will depend on it.

TAG YOU'RE IT: Yard management systems, offered by companies such as WhereNet, use wireless radio frequency technology to control fleet assets in real time once the trucks have physically arrived on-site. Benefits include improved asset tracking, labor management, and decision support information -- all leading to a greater return on assets.