

# VISIBILITY: Seeing clearly in the supply chain

Supply chain visibility solutions have come a long way in the last decade, with new real-time views that can improve your operations.

By Bob Trebilcock, Executive Editor

If you had to name one concept that's driven most, if not all, of the innovations in supply chain management since the Internet boom, it would be supply chain visibility. Think about it: from warehouse management systems to the software behind motors, drives and controls featured in the May 2010 issue of *Modern*, every application and equipment provider is focused not just on managing processes but also on providing access to real-time information about those processes to the people who make decisions.

This is not new, says John Hill, a vice president of TranSystems (419-842-2210, [www.transystems.com](http://www.transystems.com)) and a supply chain veteran whose career stretches back to the first commercial bar code systems. "Visibility has driven everything I have done in the supply chain for almost five decades," says Hill. "The mantra then, as now, was the need to match material flow with data flow, and to then proactively address any exceptions as they occur across the enterprise."

What's different today? According to Hill, it's that technology has finally caught up with the vision of warehouse, transportation and supply chain managers back in the day. "Early systems providers understood the value of knowing what's going on throughout the network," says Hill. "They just didn't have the IT tools to pull data from disparate systems and then roll it up

into a single view to whomever needed that information within a given organization."

Those tools are widely available today. To get a snapshot of what visibility looks like now, we talked to providers of seven of the most common supply chain management and execution applications both inside and outside the four walls of the plant and DC.

**Warehouse management systems (WMS):** WMS systems are tasked with managing inventory levels, labor, warehouse resources and the fulfillment of outbound orders. Today's systems can roll up the data collected from those processes and share that information across an organization, says Eric Lamphier, senior director of product management at Manhattan Associates (770-955-7070, [www.manh.com](http://www.manh.com)).

That may be as basic as telling an associate whether he is ahead or behind schedule based on the engineered labor standards for his tasks or as complex as providing upper management with a dashboard on how many orders went out the door during the last shift.

Suppliers can also access a WMS and key or scan in information about delivery plans. "With better visibility into in-transit goods, you can preplan your labor, cross-docking and flow-through activities. And, you can provide better visibility upstream to your customer service people and your customers," says Lamphier. Finally, the



WMS system can raise the visibility of tasks that are beyond their critical cut-off points, like a shipment that may not meet a carrier cutoff time, to key management personnel.

**Manufacturing execution system (MES):** Along with managing shop floor processes, an MES provides visibility in two ways, says Charles Horth, CEO of STICorp (819-373-3332, [www.sticorp.com](http://www.sticorp.com)). Those include real-time visibility into what's happening on the shop floor and after-the-fact visibility into historical data. "When it comes to real-time visibility, an MES will not

only tell you what's running, it can also monitor your processes and alert you when things are adrift," says Horth.

The system could send an alert that a machine is going out of spec before that change affects a batch of product. Or, it could send an alert to the maintenance department that a bearing is overheating before it fails and shuts down the line. After-the-fact visibility provides a window into what happened during the production process and why.

"You plan your production with the expectation that things will happen in a certain way," says Horth. "An MES

can tell you what actually happened. The delta between the two is your room for improvement."

The MES can track metrics like energy or materials consumption or whether there was waste or downtime. With that information, a manufacturer may be able to identify a machine that is not performing up to par or a supplier providing substandard materials that are affecting production. "There is a lot of value from being able to act on events in real time," says Horth. "But the longer term value is the ability to do data analysis after the fact."

**Warehouse control systems (WCS):** WCS systems have traditionally controlled automated materials handling processes in the distribution center and monitored the performance of those systems for maintenance. In that sense, the systems are doing today what they have done for at least a decade. "Most of the information available from the WCS today has been available for 10 years," says Bob Carver, vice president at Vargo Adaptive Software (262-784-2510, [www.vargo-companies.com](http://www.vargo-companies.com)).

What's different is the ease with which that data can be acquired and disseminated. An emerging set of software tools is using the information collected from materials handling systems and the WMS to pull product through the facility based on the workloads at the final processes in the production line. With a more holistic view of orders and activity, the system can balance the flow of materials to create a steady stream of work at packing and palletizing stations.

"With visibility into these other systems, we can react in real time to what's going on downstream," says Carver. "Instead of routing materials to a workstation that's backed up, we can run a continuous flow of product through the facility based on who has capacity at the time," says Carver. As with a WMS or MES, the information can be cus-

tomized and accessed by users in real time. “A supervisor can drill down to see what’s sitting on a tray on a cross-belt sorter or what his employees are doing,” says Carver. “An executive can look at their order accuracy for the day or what orders have shipped.”

**Asset management:** An asset management system is by definition a visibility system. Originally referred to as real-time locating systems, or RTLS, these systems use RFID technology to pinpoint the location of items that are critical to production. That could be anything from work-in-process to totes with critical parts to special tools or jigs required for a process. From their roots in real-time visibility, asset management systems have evolved to also monitor the status or condition of an item.

“By combining locating technologies with sensors and analytical software, we can now provide a more holistic view of assets,” says Amir Ben-Assa, industry solutions marketing director for AeroScout (650-596-2994, [www.aeroscout.com](http://www.aeroscout.com)). For instance, in addition to location, an asset management system may track the temperature and humidity of a storage area or operating environment for sensitive parts. It may also keep track of whether maintenance or calibration that is required for certi-



fication has been performed on a tool.

The system can then make that information visible by sending alerts if those critical conditions are out of a specified range. “The idea is that the system can do continuous conditioning monitoring so that people don’t spend their time looking at gauges,” says Ben-Assa. “Then, they can notify someone if a status changes.”

**Yard management systems (YMS):** In supply chain execution, a transportation management system (TMS) keeps track of trailers on the road and a WMS keeps track of inventory once it moves from a trailer into a DC. The space in between those two locations—the yard—is often a black hole. Tracking the location of trailers that may contain the parts

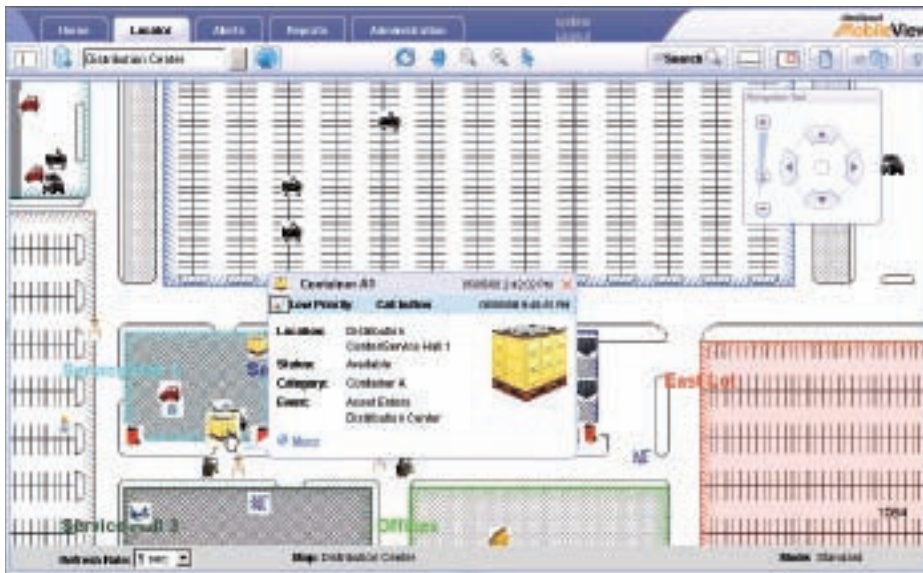
**With a warehouse management or control system, managers can log in through the Web to view processes in real time.**

needed to keep the line running or the inventory to fill orders is paper-based and error prone. That’s where a yard management system comes in to play.

Through the use of RFID and GPS technologies, these systems automate gate and yard processes and then track the location of a given trailer in real time so it can be easily located when it’s needed. “A YMS is the last mile of visibility for the supply chain,” says Aleks Gollu, CEO and founder of PINC Solutions (510-845-4900, [www.pincosolutions.com](http://www.pincosolutions.com)). “While it’s often neglected, if the yard doesn’t work right, everything else suffers.”

In addition to automatically tracking the location of trailers, like an asset management system, a YMS can collect data like when a trailer arrived at the gate, how long it sat in the yard and how long it took to load or unload. The system can then share that information with a WMS or TMS system to coordinate warehouse and transportation processes. It may also have Web-based interfaces that allow a trading partner or customer to log in and view information about their shipments. “A trailer is one of the building blocks that facilitates commerce,” says Gollu. “With better visibility, you can increase the accuracy and timeliness of your shipments.”

**Transportation management systems (TMS):** When it comes to TMS, what you’re talking about is visibility into four major transportation-related categories, says Keith Whalen, senior director, product management for JDA Software (800-438-5301, [www.jda.com](http://www.jda.com)). Those categories include when a shipment needs to ship, whether a carrier has accepted or rejected a load, whether a load is on the road or has been delivered, and when payment can be expected. For complex supply chains, a TMS can provide visibility into the status of



**Asset management systems are tied with sensors to track the location and the status of critical parts, tools and work-in-process.**

deliveries that can affect operations.

“If you need to pair loads together to build a continuous move, you need to understand when the first load is going to be delivered so you can plan the second move,” says Whalen. “Or, if you are building outbound loads from a hub based on incoming loads, you want to make sure the inbound load is going to arrive on time before you schedule the outbound load.” A TMS can do proactive monitoring of those types of conditions and then alert a user if something did not occur as planned.

**Supply chain collaboration:** Collaboration and visibility go hand-in-hand: without visibility, complex manufacturing and logistics processes between trading partners in a collaborative supply chain just can't happen. Supply chain collaboration platforms enable that visibility first by connecting all of the partners in the supply chain—manufacturing plants, contract

manufacturing plants, parts and raw materials suppliers, warehouses and 3PLs, and transportation providers. Next, the platform shares forecasts, plans and schedules among the participants and then collects data from external systems as the different players execute against the plan.

“A collaboration platform keeps track of whether suppliers have committed to a manufacturing and shipping plan, and once that plan begins to unfold, it is tracking automated shipment notices (ASNs) and inputs to make sure that everything is executing according to the plan,” says Peter Scott, vice president of supply chain solutions for Exostar (703-793-7800, www.exostar.com).

Like other systems, a collaboration platform can alert a decision-maker when an exception to the plan occurs, and provide real-time visibility into the state of the supply chain to resolve the



**Today's MES systems not only manage manufacturing processes on the shop floor, they also make the factory visible to host systems.**

problem. “If a shipment is stuck in customs, the system can show me whether I have consigned inventory at a supplier's DC, where I have inventory at a 3PL's hub, or whether I have inventory at another location that I can borrow,” says Scott. □

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