inbound logistics
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Haven't heard of machine-to-machine technology yet? You will soon enough. Here's a quick primer.

M2M101

An Inbound Logistics Staff Report

Radio frequency identification (RFID) grabbed the attention of logistics professionals over the last few years, promising rapid, dramatic transformation of supply chain management. But recently, the technology has begun to lose its appeal for some companies.

RFID implementations can be more complex than originally anticipated, and sometimes require a sizeable staff and significant capital investment – with limited prospects for return on investment.

RFID, as it turns out, is only one part of a bigger trend now vying for the logistics community's attention: machine-to-machine (M2M) technology. M2M technology supports wired or wireless communication between machines, such as a set of devices that monitor traffic and communicate the information to the city's traffic lights in order to regulate the flow of vehicles.

DATA COLLECTION TO THE MAX

M2M is gaining popularity because of its efficiency in data collection, robotics, remote monitoring, status tracking, offsite diagnostics and maintenance, and fleet management. M2M allows companies to perform live

monitoring of every phase of manufacturing – for example, providing a clear picture of work in progress.

It also gives businesses the ability to continuously monitor vendor supply, raw materials and finished product inventory control, and carrier interface, among other processes. And unlike RFID, M2M often requires minimal capital investment and IT staffing increases.

In the same way the supply chain management (SCM) community has embraced the advantages of "on-demand" services, many experts say logistics executives will appreciate the broader capabilities M2M introduces.

"The goal of SCM is to optimally coordinate and integrate the flow and use of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. The more effectively you control that flow, the greater the resulting profitability," explains Tim Lindner, manager, sales, marketing and administration for Sony Electronics' Professional Services Company, Park Ridge, N.J., which has taken a lead role in introducing M2M solutions to the North American market.

TYING IT ALL TOGETHER

"M2M technology helps companies optimize supply chain flow by tying together devices and software integral to process flows within and between the links in the chain," he continues. "This can lead to more precise and effective process analysis, remediation, and change. As a result, companies can reduce costs, increase profits, and achieve a competitive advantage."

Along with IBM and Hewlett-Packard, Sony Professional Services offers technology and services that connect devices, networks, processes, and environmental sensors in a manner that allows for objective data aggregation.

"Sony provides the M2M technology to collect and analyze data, unearth patterns and trends, automate process error remediation, and manage a range of business processes such as point-of-sale data backup, capital equipment asset management, and improved onsite maintenance service delivery to mobile truck fleet owners," says Lindner.

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– **Tim Lindner**, manager, sales, marketing and administration, Sony Professional Services

One interesting factor for supply chain professionals is M2M's broad capability for connecting devices – everything from manufacturing machines, routing conveyors, and programmable logistics controllers, to trucks, ships, planes and their respective cargo, or even office and IT equipment.

"M2M technology can be applied to any physical device that plays a role in the supply chain," says Lindner.

Hospitals, for example, can use M2M to track medical supplies as part of their demand chain model. Using a pre-applied RFID tag on a carton of syringes, a hospital can monitor real-time location of a syringe from when it enters inventory, through interim storage in a nursing station, to its use during a medical procedure – or out the back door. The device automatically triggers consumption information back to the inventory control application for replenishment ordering – without human intervention.

Another facet of M2M's flexibility is that it can be deployed on "smart" devices – those that report data on their internal condition and processes through SNMP or XML technology – or "dumb" devices that do not have internal reporting capabilities.

"Because all machines are not created equally when it comes to reporting data, supportive M2M technology, such as wireless mesh networks, make sure companies can monitor every device important to a supply chain process," explains Lindner.

Take a truck door, for example – without question a "dumb" device, right? Wrong.

"Sony is working with mobile television production trucks to add networked sensors to storage access panels and main truck doors," says Lindner. "We can create a geofence around the truck so if it is parked unattended, and a door opens, a message is sent to the truck owner's Network Operations Center, which can initiate a security breach protocol."

'MEASURE EVERYTHING'

How does all this monitoring bring shippers competitive advantage? By cutting down on process measurement complications, for starters.

"The oft-chanted mantra of SCM effectiveness is 'Measure everything.' But the task of measuring everything can be complicated, imperfect, and costly," says Lindner.

Process measurement complications and cost inefficiencies arise when machines integral to supply chain processes must be measured manually – workers take periodic measurements and enter the results into a data collection system.

This process not only consumes human resources, but also gives rise to the potential for data-entry error, which can result in imperfect analyses. The situation is further exacerbated by the fact that workers collect data periodically, so they do not capture many real-time process errors.

These factors can lead to inaccurate conclusions about supply chain processes. Often, it is only after a company incurs the costs to change processes that the magnitude of the errors become clear, eroding or eliminating expected ROI.

This ability to collect "objective" data – data that is directly obtained from devices and process control software free of human intermediation – in as

close to real time as possible, is a key strength of M2M technology.

"The aggregation of objective data from all devices and processes in a monitored system has an impact on the supply chain beyond maintenance and uptime optimization," says Lindner.

"Visualizing all the discrete processes throughout their infrastructure at a glance – through dashboard reporting – offers supply chain managers an unparalleled understanding of the pulse points of the business, some of which may not have been apparent before monitoring was applied," he adds.

In other words, the ability to gain a holistic view of the supply chain allows logistics managers to see the business in new ways, and better understand how common devices throughout the supply chain are utilized. Often, this information leads to potential changes in practices that can reduce costs.

PRICEY TECHNOLOGY NOT ALWAYS BEST

As companies venture deeper into understanding the real scope of M2M's capabilities, one thing becomes obvious: After spending the last decade investing in more expensive, more complex technology, businesses are still not always able to affect the control over their supply chains that measuring a wide range of data simultaneously provides.

The promise of M2M is its ability to pull together a variety of measurements and data in real time, without the risky capital investment in technology that can become obsolete quickly or requires ongoing maintenance fees.

Companies that have invested in enterprise-wide supply chain solutions, however, are not likely to forego them quickly. ERP system providers such as Manugistics, RedPrairie, i2, and others, continue to offer and improve upon quality SCM solutions, which new companies purchase every day.

ERP systems are also prevalent among global competitors. Although some claim they've fallen short with SCM applications, ERP systems are vital elements of most firms' day-to-day operations. Lastly, supply chain managers deal with a diverse range of operating equipment, including RFID tags, desktops, and stamping machines. For M2M to prove effective, it must link to all these systems and hardware components – which it does in a number of ways, including XML interfaces.

For this reason, M2M technology manufacturers are using "agnostic" technology and operating equipment, says Lindner.

"M2M technology has to speak to users' desires to monitor all devices and processes within their infrastructures regardless of manufacturer," he explains. "Sony's M2M technology, for example, deals with any device that 'speaks' industry standard protocols such as SNMP and XML. This helps us meet customer demand for flexibility, which is essential considering the mix of manufacturers' devices every company has."

While technologically speaking M2M's time has arrived, the question remains whether or not companies will bite. A lot of companies still suffer from a Y2K hangover caused by initial investments in software and implementations that proved to be less than effective. The headache is aggravated by ongoing maintenance costs and staffing commitments.

Because of the technophobia among many businesses, any new technology, even as promising as M2M appears to be, requires close scrutiny. Parsing out costs, particularly the upfront commitment, is essential.

M2M implementation costs vary. Typically, users achieve investment payback in less than six months, according to Lindner.

"Designing and costing out an M2M solution is dependent upon how open – and self aware – a company is when defining its applications, infrastructure, and IT operating policies," he explains. "If the initial understanding of a company's 'ecosystem' is incomplete, incremental costs will likely be incurred during implementation."

WHAT'S NEXT?

Over the past 15 years, supply chain executives have made impressive advancements thanks to the introduction of new technology. With its ability to link every element of intelligence in sourcing, manufacturing, and logistics operations instantaneously – without significant capital investment and staff enhancement – M2M has the capability to advance SCM further still. ■

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