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Manufacturers are Getting Smart

Today's manufacturers are discovering that Smart Services are enhancing the way they communicate and respond to customer demands and needs.

The manufacturing industry has faced many challenging times throughout its turbulent history.

And it is not surprising then that the economic outlook for the manufacturing industry as a whole hasn't been the brightest during the first few years of the 21st century.

Pressures have been mounting as competition continues to increase both here and abroad. Many insist the precipitous decline in manufacturing within North America is simply the natural result of market forces and increased technological innovation of emerging countries. Others insist U.S.-based manufacturers in particular have not changed quickly enough to truly address the needs of the consumer. As a result, these same companies have failed to make the necessary investments in technology that are required to address today's demanding customer. Couple this with the fact that some countries have experienced high growth and improved productivity through innovation and capital spending and you can quickly see how American manufacturers are struggling. Investments in technology such as software, hardware, and capital equipment continue to differentiate manufacturers from country to country.

Despite these challenges, U.S.-based manufacturers continue to demonstrate that they are very resilient. And as such they are beginning to reevaluate the way they go to market and are quickly discovering how advances in technology can dramatically help them meet customer demands. Whether it's applying new technology or improving their overall processes, some manufacturers are beginning to change the way they conduct business.

Now is the time for manufacturers to take a good long look at how they can make their plants more efficient and effective, reduce errors and asset downtimes, improve profitability, and ultimately better respond to customer demands. What this entails is driving innovation through developing the next generation of innovative products through the use of leading-edge technology to achieve these key initiatives.

Recent advances in network technology and the improved ability to service customers throughout the life of a product have led manufacturers to enter a new era of "Smart Services"

with the adoption of M2M (machine-to-machine) technology.

M2M enables the connection of people, devices, and systems. It refers to networking machines and other physical assets for remote monitoring and automating processes. In fact, it has been reported that currently there are more than 50 billion machines in the world, and as a result, the market will soar to an almost unbelievable 32% in annual growth and $290 billion in total revenue by 2011.

If these predictions are on target, then nearly all machines will one day benefit from M2M communications. Traditionally, when machine-to-machine technology was first talked about, it was a question of traditional telemetry applications being converted into Internet-based or solution-based applications. Many analysts admit the solutions tended to be network add-ons, easily identified applications that were said to be high-cost and low-volume. Now we are seeing the introduction of regulation-based applications, such as automated meter reading and container tracking.

As we move forward, we are beginning to see the industry branch out, making itself known in the world of enhanced services. Much like the Internet has created many new opportunities, M2M is creating new business models and opportunities. Robin Duke-Woolley, a principal and analyst with Harbor Research Inc., www.harborresearch.com, San Francisco, Calif., insists, “M2M is the third wave of the Internet with a host of new capabilities and applications.”

Smart Services

What does M2M really mean for global business? If you set aside the basic discussion about devices and machines being able to talk to each other, M2M technology is offering what is being coined as “smart services.” These “smart” services are just another step in the evolution of M2M and what it is enabling manufacturers to accomplish in a global market.

According to *START-IT*’s sister publication, *M2M* magazine, www.m2mmag.com, Carol Stream, Ill., smart services are one of the six pillars of M2M. And as such, smart services are the networking of finished products and monitoring them throughout their lives. By networking the equipment they make and service, product-based manufacturers such as OEMs (original-equipment manufacturers) and service organizations can add value to their products, ensure optimal performance, and create additional service revenue.

With M2M as the underlying technology foundation, these smart services will create a plethora of new relationships between businesses and customers. As M2M gains popularity and as more companies unleash its power, these new service offerings will shape a new movement that will spark new partnerships between business-to-business and business-to-consumer.

Companies and businesses that embrace M2M solutions and smart services will have a real shot at differentiating themselves from their competition, while at the same time ensuring asset integrity, productivity, and uptime of their partners' assets. Customers, in turn, will seek out technology suppliers with the ability manage, track, and service their most valuable assets.

"As a result of having connected products, a manufacturer becomes a valued partner to its customers by revealing realtime intelligence about how customers are using its products. The assets become part of a network between the enterprise and the asset owners, the service worker and the maintenance crew, and most importantly, the end users," says Joan Waltman, president of Qualcomm Wireless Business Solutions, www.qualcomm.com/qwbs, San Diego, Calif., a provider of M2M solutions.

She adds, "Manufacturers that adopt an added-value service model will be differentiated as key partners, and those that do not will be further commoditized. Customers will look for products that live on the network; this will be the foundation of relevance."

We are beginning to see how M2M technology is dramatically changing the relationship that people are having with their assets, resources, and employees. With M2M, there is a movement afoot that is creating a shift from a product-centric environment to a service-centric world, and only those manufacturers that respond will gain a tremendous financial advantage.

Underlying Approach

Smart services are proving to be a different animal than the service offerings of the past, and customers perceive them as having entirely new value. To begin with, they are fundamentally preemptive rather than reactive or even proactive. Preemptive means that actions are based upon hard field intelligence rather than anticipated use or an undesirable event. Smart services are thus based upon actual evidence that a machine is about to fail, or that a customer's supply of consumables is about to be depleted, or that a shipment of materials has been delayed.

"M2M capabilities integrated into business context allow us to accomplish two things," explains Thomas Odenwald, a research director for SAP Labs LLC, www.sap.com/research, Palo Alto, Calif. "First, existing business processes that manage service and maintenance from end to end can be optimized and automated. Since the data is directly sourced from the equipment, the monitoring, tracking, and tracing of goods and assets (and people) can be greatly enhanced. It allows greater service revenue and higher margins for the service provider, while at the same time reduces service and maintenance costs for the customer."

The second accomplishment, Odenwald says, is the enablement of a new generation of machine-to-business processes.

“In today’s assets, the hardware aspect becomes more and more a commodity, and the relevance and amount of software is increasing. Being able to automatically upgrade and version your assets, allow analytic pattern detection, or entitle them with new features and functions remotely is now possible thanks to increased device intelligence and ubiquitous connectivity.”

SAP is taking an especially active role in advancing smart services in the manufacturing enterprise. As research director for SAP Research North America, Odenwald is tasked with identifying emerging IT (information technology) trends such as RFID (radio frequency identification) and sensor networking.

“To reach instant visibility and therefore extended ‘real-world awareness,’ intelligent M2M devices like programmable logic controllers play a key role,” Odenwald says. “They are ‘aware’ of the situation on the floor and can directly synchronize with the execution control and resource planning systems.

“Additionally, using technologies like RFID to identify sub-assemblies or software agents talking to resource allocation services, enable manufacturing steps to be performed locally and allow new control architectures based on local intelligence. Deviations and incompatibilities can immediately be detected and deliver alerts and work instructions to the worker using multimodal communication tools. Product structure and performed tasks can automatically be documented for quality analysis and product tracing purposes.

“For all these aspects to be implemented, new methodologies for intelligent modeling, retrieval and interpretation of data from the production process for planning purposes is needed.”

Smart services are one of the pillars of M2M—sensor networking, RFID, telemetry, telematics, remote monitoring—under which these new customer-driven services will be provided. Adopting an added-value service model will be the key differentiator for manufacturers. As a result, new smart services will decrease downtime, improve profitability and most importantly, create peace of mind for businesses and their customers.

To truly understand what smart services have to offer, it’s important to understand we are talking about machines and devices talking to machines and devices. Whether providing a service or tracking a product, it’s still about gathering data to make realtime decisions in a networked environment.

Many of the M2M leaders are helping manufacturers embrace the application of smart services. START-IT asked some of the industry leaders to discuss the role of smart services within a host of manufacturing environments. Industry experts insist smart services will dramatically alter the way manufacturers respond and react to consumer requests. With machine-to-machine solutions

serving as the underlying technology application, smart services will play a critical role in the success of manufacturers of all sizes in many vertical markets.

Customer Loyalty

Most manufacturers today face a host of challenges when selling their products. For one, their industries are mature and in many instances their products are being commoditized, explains Steve Pazol is vice president and general manager of nPhase, www.nphase.com, Chicago, Ill., a Qualcomm business. In addition, there is little perceived differentiation between manufacturers' products.

To combat these trends, many manufacturers have moved to new service models as a growth platform for their business.

These service components, explains Pazol, could include providing extended warranties, training, site audits, consumables, system tuning, and more. Service businesses have their own challenges, however. Service tends to be human-capital intensive with relatively high turn-over in some sectors.

He adds, "Service provided the traditional way is typically reactive—a technician is dispatched either when a customer calls or when making regularly scheduled rounds. Even traditional service becomes difficult to differentiate against the third-party service providers and consumable suppliers."

"Enter smart services," says Pazol. "The premise behind smart services is that companies can provide innovative and differentiated offerings as part of a service offering by connecting to your products in the field and extracting insight remotely. In other words, companies can provide better service more cost effectively when you have visibility into how your products are being used in realtime or near realtime."

Take for instance, an OEM. These manufacturers are typically best positioned to know how to operate and service their products. However, once that product is installed at a customer facility, the OEM has very limited visibility into how that product is being used. Many vendors insist that smart services changes all that. As an example, if an air compressor OEM could see the performance of its customers' systems at all times, it would know when one of its systems is consuming too much electricity, which is an indication that it needs to be tuned or have a filter replaced.

With smart services, OEMs can then provide proactive service instead of reactive service. In this scenario, says Pazol, "It can compete for business on a total cost of ownership basis versus cost of the product. Not only will the customer have the peace of mind knowing that its systems are

performing optimally, but the OEM will be able to prove its value to its customer over and over. With visibility into how that machine is running at all times, the OEM has an advantage that cannot be easily replaced by a third party."

Pazol adds early innovators like ABB Robotics, www.abb.com/robotics, Shanghai, China, and Gardner Denver Inc., www.gardnerdenver.com, Quincy, Ill., have ventured into the business of smart services and are on the front end of the value-discovery process. Many of the other early mainstream adopters are starting to realize that smart services are not something they can afford to ignore. The art of their smart service solution will ultimately be a key factor in this new, highly competitive environment.

Smart Services in Action

Today's competitive marketplace requires lightning-fast response. M2M networking takes communication to a whole new level. Utilizing advances in device networking technology, manufacturers can now connect almost any type of equipment or machinery to a network to interactively access, evaluate, and use data from equipment in realtime. According to Rahul Shah, product line manager, Lantronix Inc., www.lantronix.com, Irvine, Calif., "Users can monitor, diagnose, and control devices and their performance from virtually anywhere, at any time. The result is realtime information transport for maximized efficiency, better service, reduced overhead, and dramatically streamlined operations."

He adds, "With device-networking technology, customers can also provide an increased level of service to its customers that would have been unimaginable a few years ago. For example, in the commercial printing industry there was a need to keep pace with rising resource costs. Customers needed the ability to accurately monitor all operations, materials, and utilities used to quote, track, and invoice customers based upon time and materials. Laboriously, print companies' first attempts to track time and materials used a flow meter similar to a water meter to calculate ink, paper, and other costs over the course of a month. At the end of that month, they would then divide that figure by the number of days a print job lasted to determine the cost of that job.

Productivity technology manufacturer, Link-Tech Inc., www.link-techinc.com, Pewaukee, Wis., set out to provide printers with a better, more efficient solution. Link-Tech knew that a network-enabled monitor would provide printers with access to realtime materials and operational data, giving its customers more accurate print estimates. The company, however, realized an integrated M2M solution was needed to effectively connect both IT and non-IT devices to either a network or the Internet so they could be more efficiently managed. That's when the manufacturer turned to Lantronix device networking solutions.

As a result, Link-Tech refined ink monitoring technology by integrating a user-friendly touch

panel with its Ranger R3000 CAN bus Flowmeter to measure ink usage, providing printers with a measurement system that is both easy to operate and maintain.

“The collaboration of Link-Tech and Lantronix device server technology provides accurate data in realtime directly to the commercial printer’s IT center, enabling a printer to monitor all jobs in process. This solution also alerts printers to maintenance needs before there is a real problem and can even schedule maintenance downtime as it best suits the printer’s schedule. This ‘lights-out’ operation allows monitoring to be accomplished without anyone being onsite,” says Shah.

As a result of implementing device networking, commercial printers can now monitor and have access to crucial data almost instantaneously. With information at their fingertips, printing companies now have the ability to precisely track costs that truly make the time and materials business model a reality. These tangible improvements have proven to be easy to use, eliminate recording errors, and allow more accurate customer quotes which ultimately benefit a commercial printer’s profitability.

“Overall, with M2M technology, Link-Tech is now able to provide a whole new level of service to its customers allowing them to reduce maintenance costs, improve billing services, and prevent downtime, providing vital intelligence to their business,” explains Shah.

Enabled by M2M technology, smart services will continue to gain popularity, and more and more manufacturers will quickly discover the benefits that can be achieved as a result of satisfying customer demands. •

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