

## Technology Labs

# Manufacturing Telematics Services

## Sensors Create an Aware Environment

Imagine that you operate a manufacturing facility or, perhaps even a large utility. A regulatory inspector shows up unannounced and wants to audit the maintenance records for a series of specialized hydraulic pumps. What do you do? Today, you begin by spending hours or even days manually sifting through records and documents to find what the inspector has requested—if it was even documented properly in the first place.

And tomorrow? The inspector does not ask you—the pump can tell her itself. Developed at Accenture Technology Labs, the Manufacturing Telematics Services prototype demonstrates how the combination of embedded computing, sensors, and short-range wireless technologies makes for an “aware”

environment. Such environments create intelligent pieces of equipment that are aware of their status and surroundings, interact with technicians, revolutionize how services are performed and automate the regulatory (or even tax) compliance process.

Sensors and embedded computers already exist in most industrial environments, but they are typically reserved for use on small numbers of expensive pieces of equipment. What happens when these devices make their way from the few mission-critical components to the multitudes of equipment all around you? Just one benefit alone, such as real-time awareness of potential component failure, can save a utility from costly downtime, which in some cases can be up to US \$1 million each hour.

## The Technology

One reason self-monitoring systems are reserved for special pieces of machinery is due to the enormous cost of running cables between each piece of equipment and a central monitoring facility. The Manufacturing Telematics Services prototype could be much more economical and available to many more pieces of equipment—primarily because Bluetooth technologies and 802.11 (Wi-Fi™) standards eliminate the need to lay communications cables over long distances.

The prototype shows how companies can outfit individual pieces of equipment in the field with sensors that broadcast and record ongoing system activity. The equipment is also wirelessly linked to a repository containing maintenance history, procedures,

and sensor data. This enables the sensors on a pump, for example, to actually help fix the problem. Rather than passively waiting for the technician to arrive, the sensors can notify the dispatcher of all the tools and parts that will be needed for the repair. The pump can access its maintenance history and ensure the system's ongoing operation by rerouting certain functions. When the mechanic arrives on the scene, he can use his personal digital assistant (PDA) to access previous notes, past repair or service information and even a video detailing the last service. During the repair, the system documents the maintenance activities so that industry regulators and other mechanics will be able to understand how a particular problem was resolved.

## The Implications

Making industrial environments more "aware" will provide a variety of benefits:

### **Increased Safety:**

An environment that is more aware of its surroundings can also track activities and enforce proper safety procedures. Imagine a machine that prevents a mechanic from performing routine maintenance unless he was wearing the proper safety gear.

### **Reduced Downtime:**

Systems that are aware of their own operations can distribute load and functionality throughout the facility, eliminating the potential for a single point of failure. A better understanding of component operation helps facility managers detect problems before they occur, allowing for a higher percentage of planned versus unplanned maintenance.

### **Cost savings:**

Operational and sensory data that is made available via Web services can lead to the entire maintenance and regulatory functions being outsourced or managed more efficiently. Currently, third-party maintenance providers send crews to conduct manual checks at regular intervals. By accessing a comprehensive, continual and real-time view of the equipment's functioning via the Internet, these vendors can wait until they recognize a potential problem before making a site visit.

### **Product Design:**

Original equipment manufacturers will be able to tap into and aggregate system data from multiple sensors on a variety of industrial parts. With this information, they will be able to develop customer and product insights that will allow them to more accurately predict problems before they arise and improve their equipment design and construction processes.

Regulatory agencies will be particularly interested in the data generated. Currently, regulators check for compliance by manually sifting through countless paper records. With sensors collecting data on a continual basis, regulatory checks become not only more efficient, but more thorough. Specifically, regulators could immediately and even remotely access a full view of the equipment's maintenance history and status. Compliance inspections therefore become real-time, continuous and more accurate.

Accenture Technology Labs developed this prototype to show how technology can shape the future through ubiquitous sensors and insight from real-time information. Accenture calls this vision of the future Reality Online. To learn more about Manufacturing Telematics Services and Reality Online, visit: [www.accenture.com/accentruetechlabs](http://www.accenture.com/accentruetechlabs).

## About Accenture Technology Labs

Accenture Technology Labs, the technology research and development (R&D) organization within Accenture, turns technology innovation into business results. The Labs create a vision of how technology will shape the future and invent the next wave of cutting-edge business solutions.

Working closely with Accenture's global network of specialists, Accenture Technology Labs helps clients innovate for competitive advantage. Accenture Technology Labs are located in Chicago, Illinois; Palo Alto, California; and Sophia Antipolis, France.

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