

to meter reading, the system's bi-directional communication gives utility companies the opportunity to enter the emerging digital home market with new remote monitoring and control services such as electricity overload control, gas leakage detection and power cut-off notification. Because the system is based on ZigBee, the industry standard wireless platform for home automation, this paves the way for utility companies to expand into new services.

In the world of supply chain management, where assets moving through the system have been a well-known target for RFID monitoring and automation, even the lonely vending machine is getting connected. In an environment where lack of real-time data leads to over- and under-maintenance and inefficient stocking, vending telemetry can change all that by providing operational data about machine usage. Vendors such as Comtech provide systems for remote monitoring and control of vending machines over the Internet, so stock and sales data can be known at all times. The e-Port from USA Technologies enables vending machines to accept credit cards and provides Internet connections to corporate offices so companies can assess sales, out-of-stock, out-of-change and maintenance conditions.

COMPLEX BUSINESS SYSTEMS

Things are being connected into complex systems that deliver deep capabilities. Physical assets are linked and monitored to synchronize inter-enterprise business processes. Traffic systems connect an array of monitoring devices and signs into a more efficient traffic management system. Employees and soldiers in hazardous environments, and safety equipment, are monitored wirelessly to improve safety. All manner of battlefield equipment and soldiers are connected in future warfare environments. Drive-through windows and even shopping carts are linked to remote call centers for better customer service.

Synchronized Business Processes. Having RFID data is one thing, but putting it to smart use is another. InSync Software provides business applications that leverage real-time RFID and sensor-based computing to automate complex processes across disparate businesses. Physical assets can be tracked in real time and their location and condition reported to back-end systems

and partner systems. Then the system uses this information for management purposes – for example, to control purity of an asset, such as a shipping container used to transport semiconductor wafers (the containers must be free of all contaminants).

InSync's EdgeWare solutions are used to automate the forecast-to-cash business cycle with trading partners, and to track and trace assets in the value chain for processes such as distributed inventory tracking, spare parts management, and returns and warranty management.

In an example of distributed inventory tracking, a Fortune 500 semiconductor manufacturer has strict delivery and quality requirements that its outsourced, overseas manufacturing facilities must meet. Coordination with the outsourced manufacturers was difficult due to disparate, disconnected systems. Many manual processes were being used to ensure just-in-time delivery and to manage the delivery schedule.

To manage this fractured process and improve efficiency, the manufacturer has deployed an InSync Edgware solution that utilizes RFID tags and antennas to manage the physical inventory, and business-to-business software to automate the interaction of partners based on their trading partner agreements.

The solution tracks events and monitors the health of the trading agreements by collecting and recording events automatically as shipments make their way through the supply chain. RFID tags on shipping containers are read at shipment, pick-up, transfers between shipping hubs, receipt at the customer site, and when the containers are put on the shelf. Edgware monitors key process indicators and service level agreements. If a problem occurs in the supply chain, the solution alerts the manufacturer and partners to take proactive action to meet the supply chain commitment. This has increased accuracy of the known physical inventory, reduced transaction errors, and reduced labor required for the end-to-end process.

The combination of RFID and business-to-business collaboration provides a significant benefit to all partners in the business ecosystem. InSync synchronizes the business ecosystem – manufacturing plants,

warehouses, distribution centers and the like – using collaborative software wrapped around RFID and sensor technology.

Transportation Tune-Up. Transportation systems often employ a hodgepodge of devices for traffic monitoring and alerting. In Colorado, the state transportation department has integrated over 350 devices from different manufacturers, such as radar devices, ramp meters, toll tag readers and dynamic message signs, into a coherent system for safer and more efficient traffic flow. The system orchestrates complex traffic routing scenarios, gathering data from four different kinds of speed devices (more than any other in the nation), calculating trip travel times and automatically posting them to dynamic message signs. The system can also issue a statewide AMBER Alert, an emergency alert that a child has been abducted, in 10 minutes, down from 2.5 hours. This has resulted in a 100 percent recovery rate since the system went into production.

The ability to merge divergent technologies, from intelligent devices to mundane items, has opened up a new era for transportation management in our state.

Designed and developed by CSC, the Colorado Transportation Management System (CTMS) unifies operations, maintenance, systems deployment and incident management plans into a centralized command and control center. Data is used to detect trends and inform operators on how to manage traffic flow. Operators can then post alerts to dynamic message signs, such as “accident ahead; please slow down” or “game today; alternate route advised.” The system, which earned the CSC Award for Technical Excellence in 2006, is the largest intelligent traffic system initiative in the state.

CTMS involved rapidly integrating independent devices from hundreds of manufacturers, connected over a variety of networks: fiber, phone lines, cellular and IP. The solution was a pluggable integration design pattern that enables any device to plug into CTMS in days rather than months.

“Colorado very much prides itself on its ‘cowboy’ heritage. Sometimes the thought of adding more pavement is not popular, and more importantly, adding pavement is costly. Because of this, we feel it is important to make our roads work smarter,” explains Rod Mead, Colorado Traffic Management Center operations manager. “The ability to merge divergent technologies, from intelligent devices to mundane items, has opened up a new era for transportation management in our state. In this time of instant information, commuters and travelers are expecting more and more, faster and faster. The challenge of not only merging these technologies but focusing the information in a user-friendly format will continue to drive this project. The CTMS system places Colorado not only on the forefront of technology but keeps us there into the future.”

In Japan, traffic management of a different sort is underway. The country recently experimented with putting RFID tags on bicycles to communicate parking availability and manage abandoned bicycles. Bicycles are a major form of transportation in Japan and often the only way to get to a train station. Bicycle storage facilities are mandated by law to be available near train stops; the average facility holds nearly 300 bicycles.



This Remote Traffic Microwave Sensor, part of the Colorado Transportation Management System, detects vehicle presence and measures traffic parameters in multiple independent lanes. Approximately 200 RTMSes are integrated into CTMS and provide traffic information in real time.

Source: EIS Electronic Integrated Systems