

Radiofrequency Identification Systems

by Lanier Norville

Efforts among hospitals to increase efficiency and reduce spending have driven the growth of electronic asset and inventory management solutions. These systems are used to track and manage everything from equipment, supplies and pharmaceuticals to staff and patients. One of the newer tracking technologies on the market is the hospital radiofrequency identification (RFID) system.

A number of companies have developed hospital-specific RFID tracking software and hardware systems since the mid 90s. RFID systems consist of identification tags, which can be placed on a variety of objects, and scanners, which contain an antenna that can track and identify the objects. The scanner recalls specific data, such as lot number, serial number and expiration date.

RFID is most commonly used to track mobile assets such as beds, wheelchairs and mobile equipment, though a decrease in the cost of the technology is driving its use on surgical devices and disposables as well. RFID technology has OR-specific applications, such as preparation of supplies for surgical cases, recording of case information, and automatic generation of alerts when it is time to restock or reorder supplies.

RFID's ability to efficiently manage administrative processes simplifies inventory management. Some systems automatically deduct supplies from the hospital's inventory record when they are removed from the shelf, while others employ handheld scanners so that each supply used in a case can be recorded as it is used.

THE GLOBAL RFID MARKET

Though still a relatively new technology, "RFID is positioned to be a top solution in manufacturing, asset management, hospital logistics, patient throughput, product distribution, clinical trials and sample distribution," according to a Kalorama Information report. Manufacturers of health-care-specific RFID systems include Alien Technologies, Caduceus Systems, HealthLine Solutions, Hospital Materials Management Information Systems, Mobile Aspects and SysPRO, among others.

The worldwide healthcare RFID market was worth approximately \$750 million in 2009, growing at a rate of 58.1 percent between 2007 and 2009, according to Kalorama. Asset management accounts for a third of the total healthcare RFID market.

Drivers of growth include an increasing number of hospitals implementing RFID systems, growing market segments of patient and pharmaceutical tracking and the declining cost of the technology. According to Ramiro Roman of GE Healthcare Performance Solutions, "The primary driver of growth is the hospital's need for cost reduction." And market reports predict that costs will continue to decline. "Passive RFID tag costs declined from \$1 in 2000 to roughly 10 cents in 2009," according to Kalorama. "Similarly, the cost of RFID readers declined from about \$1,000 in 2004 to about \$200 in 2009."

"We're going to see that cost come down even more," says Patrick Blackwell, vice president of client services at Aethon. Blackwell predicts that the cost of RFID tags could drop to as low as two cents in the next five years.

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-Patrick Blackwell

MARKET OUTLOOK

According to Kalorama, the global healthcare RFID market will reach a value of \$3.4 billion by 2014, representing a 35 percent compound annual growth rate. "A number of factors have suggested this market growth, including the growing concerns over healthcare spending, safety, streamlining and efficient patient care," according to Kalorama.

Though current use of RFID systems in hospitals is limited, primarily used to track high-dollar mobile assets, industry experts predict proliferation of the technology in the next five years. "Industry analysts believe that RFID/RTLS has less than five percent market penetration in the U.S.," GE Healthcare's Ramiro Roman says. But according to a GE Healthcare study, up to 30 percent of U.S. hospitals intend to evaluate RFID for purchase in the next two years. "Hospitals have to decide if the cost of waiting is worth delaying the potential benefits to the efficiency, quality, and cost of care."

"Fixed assets are a driving force, but I think [the technology] will migrate to the materials and trickle down," Blackwell says. "There will be some cutoff point, but we all know health care costs are increasing, and if you want to do more with less, you're going to have to have some other efficiency gains."



Aethon // TUG ROBOTIC RFID SYSTEM

Aethon's TUG is an automated system that uses a fleet of centralized and shared TUGs to form an Automated Robotic Delivery System. The TUG robots can perform routine asset transport, minimizing time spent looking for equipment or retrieving and delivering supplies and assets. TUG is able to manage scheduled or on-demand deliveries at any time of day or night, transporting a variety of hospital carts weighing up to 600 pounds. The TUG system can be employed for food services, medication delivery using an integrated chain of custody system, waste pickup and transport, and both scheduled and on-demand supply delivery.

Each TUG robot has an RFID antenna, which picks up and records asset location data as it is encountered during routine deliveries. Additionally, nightly sweeps can be performed, generating a report of the location of all tagged assets within the facility.



GE // AGILETRAC SURGICAL SERVICES

AgileTrac Surgical Services from GE Healthcare helps track and manage the flow of surgical patients and resources using Real-time Location System (RTLS) technology. Data is transmitted to a central visualization system that enables staff to see in real time the exact status of each operating room and patient. Milestone displays show completed and pending tasks, and prompts are triggered when tasks are not performed. Notifications are sent at each step in the care process.

AgileTrac Surgical Services also quickly locates equipment and tracks schedules. Information is integrated with the hospital's operating room information system (ORIS) and electronic medical record (EMR) for a seamless flow of information across the enterprise. The system generates, tracks, and completes requests and notifications for patient beds, resources, equipment maintenance and repairs.

Caduceus // MMIS SYSTEM

The Caduceus Materials Management Information System (MMIS) automates supply-related processes, managing the assembly of physician preference carts via a system-directed workflow. When an OR tech prepares a cart for a case, a handheld device connected to the system prompts the tech through each step of the process. As items are removed from inventory, scanned with the handheld and placed on the cart, the system maintains a real-time perpetual inventory.

When minimum levels are reached, the MMIS generates replenishment orders or purchase orders. After a surgical case is complete, the handheld directs the tech through a reconciliation step, ensuring that supplies called for during surgery, and those on the cart that were not used, are recorded accurately. All Department of Defense data standards are supported by the system.