



Technology

RFID – Immediate Benefit to the Healthcare System

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Through the years hospitals have invested significantly in IP networks and more recently Voice over IP (VOIP) and wireless IP. Now there is a technology that layers on top of these existing networks to offer a tremendous value and return on investment.

New emerging technologies like Wi-Fi RTLS (real time location system) and RFID (radio-frequency identification) offer viable solutions that reduce the disappearance of medical equipment and devices from hospitals and help staff locate equipment that may have ended up in other parts of the facility.

With hospitals shying away from proprietary and diverse wireless networking solutions and investing in a single wireless network (Wi-Fi) based on IEEE-802.11 industry-standard technology, they are able to provide their mobile workforce untethered access to both voice and data services. Locating hospital assets has become a natural extension of these capabilities.

In a recent highly-endorsed study by the Branham Group “eHealth in Canada”, industry experts predicted an accelerated adoption of IT in healthcare over the next decade including the use of RFID. This shift has been driven mainly by concerns of patient safety and escalating operating costs.

The Need for Active Asset Tracking

When assets like IV pumps, heart monitors, beds and wheel-chairs are constantly on the move within the hospital, finding them is often a major challenge. Studies have shown that nurses and health practitioners can spend anywhere from 30%-40% of their shift just searching for equipment. As a result, hospitals will buy or lease 20% - 33% more equipment than they need annually to accommodate for lost or misplaced equipment. At around \$3,000 a piece for the average biomedical device, this is an extremely costly strategy. Eliminating this unnecessary spend can save millions for hospitals.

Asset invisibility can result in significant costs, lost time and long patient/staff wait times. This compromises a hospital’s ability to provide high quality patient care and increases capital

expenditures, collectively amounting to millions of dollars a year.

With the ability to locate and track asset usage, hospitals can better utilize their equipment, thus increasing nurse productivity and reducing their work-related stress. Active RFID technology not only tracks where the equipment is located in real-time (preventing costly loss of equipment) but it can also identify if a healthcare facility’s inventory of equipment is over or under fulfilled.

The chart below outlines some of the key departmental groups that can utilize active RFID asset tracking to improve service delivery, reduce operating costs and make better use of departmental assets.

Medical Staff	Rapidly locate equipment including IV pumps, vital signs monitors and patient charts to provide the highest level of patient care.
Transport	Optimize workflow and improve efficiency by quickly locating equipment, e.g., wheelchairs with IV drip poles.
Biomedical Equipment Team	Locate assets for break/fix and preventative maintenance, and understand usage patterns to drive the appropriate asset allocation.
Hospital Operations Team	Maximize asset utilization and mitigate risk by ensuring the best possible patient and equipment care; continuously drive improvements in overall hospital workflow and efficiency.

The combination of RTLS software technology and active RFID asset tracking tags operating on standard Wi-Fi infrastructures are emerging from companies like PanGo Networks. These software 802.11-based active RFID applications add the ability to:

Track equipment affixed with 802.11-based active RFID tags (i.e. medical equipment including IV

pumps, vital signs monitors, wheelchairs, etc.;

Identify the location of devices that incorporate 802.11 Network Interface Cards (NICs) such as notebook computers and PDAs;

Integrate location information into asset management and patient monitoring systems.

These newer approaches offer advantages over traditional active RFID technologies. First, they use the existing Wi-Fi infrastructure which offers significant cost reduction in terms of initial installation and on-going operation/maintenance. Second, they enable opportunities to deliver exciting new applications that combine voice, data and location awareness which can improve patient care and increase the efficiency of processes such as Admissions, Discharge and Transport (ADT).



Things to consider when evaluating the need for RFID Asset Tracking

When evaluating RFID capabilities you should look for solutions that offer comprehensive asset tracking applications designed with clinical and biomedical users in mind.

Here are some important functions to look for to make the system easy to use:

Asset monitoring The system should provide an intuitive map, floor plan and tabular view of assets and asset-related information. Users should be able to easily navigate from space to space (rooms, floors, departments, buildings, etc.) to locate needed assets. Monitoring functionality should include advanced search and filter capabilities so users can quickly locate specific assets or types of assets and the added capability of being able to track active, passive and non-tagged 802.11 devices.

Event-Based Notifications. Business rules-driven functionality that delivers alerts based on the location and/or status of assets and tags. The ability to enable notifications for when assets move in or out of certain departments, move close to equipment that can cause an interaction (i.e. an x-ray machine cannot enter a room where an active MRI machine is operating) and automatically send low-battery alerts when it's time to replace batteries in tags, should be included.

Reporting An asset tracking application should be able to record and store historical asset location/status events for reporting and analysis. In addition to

standard reports does the system also support custom reports.

Wi-Fi-based location serving The system should be able to use existing wireless network infrastructure 802.11 EEE (Wi-Fi-based location serving) as the core tracking technology. This will offer long-term solution viability and still remain cost effective.

Ease of Integration. The system should be interoperable with key Hospital Information Systems applications such as asset management and patient monitoring software and new and/or existing Wi-Fi infrastructure.

In conclusion, Wi-Fi RTLS and Active RFID are very practical and viable solutions for a healthcare environment. Layering an RFID system on top of existing IT investments, hospitals are able to cost effectively improve departmental efficiency, workflow and staff productivity. Less time is spent searching for equipment, when nurses are able to quickly locate assets equipped with Active RFID tags. RFID has shown to cut capital costs by maximizing existing assets and reducing the need to over procure medical equipment. Finally, intentional or unintentional loss of equipment is reduced.

Healthcare needs all the help it can get to manage costs. RFID is a low cost solution with a clear and simple return on investment. ●