

Three high impact areas for remote monitoring in health care

by Gus Iversen, Editor in Chief, October 26, 2017

Consumers are generally comfortable tapping into information systems that remotely monitor and control their home electronics, heating and cooling, lighting, and alarm systems. These widely accepted technologies provide consumers with increased flexibility, confidence and autonomy by eliminating the need to tether them to a physical location in order to understand the disposition of the environment they are monitoring or controlling.

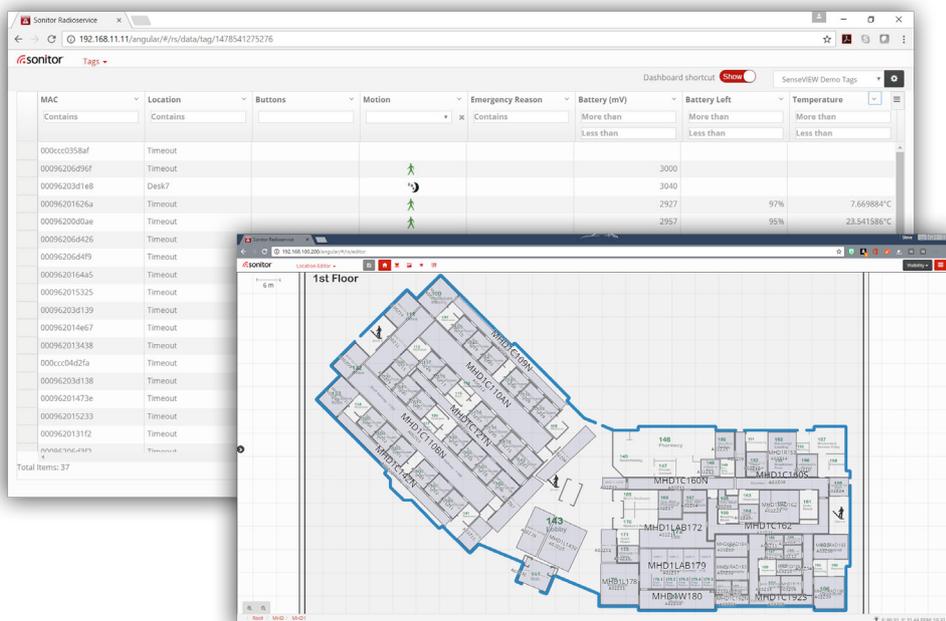
Soon, most everyday household appliances will be equipped to communicate via the Internet of Things (IoT). In many respects, the innovation in consumer electronics has paved the way for remote monitoring in health care. Remote monitoring is now widely used in patient care, maintenance and repair data acquisition of medical equipment, software upgrades for medical equipment and hospital facility control systems.

Now that the benefits of remote monitoring using the IoT are broadly acknowledged, the question is: what else can it improve? Here we explore various areas where remote monitoring has had a positive impact in health care and how those impacts influence outcomes.

Remote patient monitoring

Remote patient monitoring (RPM) allows a patient to use a mobile medical device to perform a routine test and instantly send the test data to a health care professional. Common applications include cardiac activity reporting and glucose monitoring. Additional areas like infertility treatment are also turning to RPM to save patients time and money.

In addition to convenience and cost savings, RPM can significantly improve an individual's quality of life. This is especially true for patients managing complex conditions such as chronic kidney disease, who may be receiving hemodialysis at



home. One of the key features of RPM is that it can detect a change in a patient's condition early on so a trip to the emergency room or other acute care may be avoided. This early detection has also been shown to reduce the number and duration of hospitalizations.

RPM is also a boon for health care providers who can educate and communicate with stable patients remotely thus freeing up more time for acute patients. This added efficiency, coupled with an industry-wide need for wireless mobility in health care, have greatly facilitated the adoption of RPM in both community and institutional settings.

Migrating technology: From manufacturing to hospitals

The more recent phenomenon of hospital equipment monitoring borrows from the manufacturing industry which has been relying on remote monitoring capabilities to keep machines up and running for decades. Automating many of these

activities via the IoT has saved that industry significant resources, including employee hours.

Medical device OEMs are now taking a page from the same book. Using IoT capabilities to monitor the performance of client medical devices and their facility's systems, they have made it possible to anticipate potential failures or recognize them early enabling timely intervention. This is particularly relevant to imaging equipment such as X-ray, MR and CT scanners, which are extremely costly to replace.

Several factors are driving health care providers to adopt remote monitoring. These factors range from favorable government regulations, to the need to manage shrinking margins to the promise of increased efficiency from reduced device down time. Remote monitoring also provides OEMs with another quality tool to drive customer satisfaction and manage their own margins. This is particularly important when systems are under

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warranty. When major imaging systems go down unexpectedly, the outage and repairs can be longer and costlier for a host of reasons.

OEM, hospitals and other stakeholders, including service providers, have come to understand that IoT connectivity can drive competitiveness. The IoT-connected medical imaging equipment market is expected to grow at a 17 percent compounded annual rate. These platforms will only become more valuable as they enable support services like data analytics.

Migration of IoT enabled remote monitoring to RTLS

The IoT is poised to play a central role in health care quality improvement efforts. One example is in the proliferation of Real Time Location Systems which are enabling health care providers to manage assets, workflow, patient flow, infection control, and much more. These systems operate in real time and have become increasingly critical to the core operations of health facilities.

Managing RTLS downtime and minimizing any gaps in coverage are essential. Hospitals require a process to consolidate and synthesize the constant flow of information from these systems to produce a clear understanding of their performance. Advanced RTLS software features simple, web-based user interfaces that can answer the important questions about people, assets, and work flow, while also constantly monitoring the system's real-time communication, battery status and overall system performance. Through these software interfaces, RTLS parameters can easily be remotely updated and reconfigured when necessary.

One global RTLS leader, Sonitor, has taken steps to make RTLS even more reliable with the introduction of a web-based, remote monitoring and diagnostic tool used in conjunction with Sonitor Sense, the flexible, open integration RTLS platform that combines proprietary ultrasound technology with Wi-Fi and LF. Sonitor's SenseView was introduced at HIMSS 2017 and is being implemented across its installed base. SenseView provides real-time health and battery status, and a dashboard or map view for simple visualization.

"We developed our remote monitoring capabilities because we believed that we could decrease downtime, lower operational costs, and increase equipment reliability and longevity of our RTLS platform," said Sandra Rasmussen, Sonitor's senior vice president. "We have always provided high quality, responsive support services for our customers, and this was a way of doing so even more efficiently and in real-time. We want to proactively alert our customers about a potential issue before it becomes a problem, rather than have them call us when something is already a problem."

Through web-based solutions, system management can also be administered directly by the RTLS providers themselves. RTLS companies can directly perform remote diagnostics and configuration with their own teams of technical personnel. This combination of new software monitoring systems and expert RTLS remote supervision can give RTLS users confidence that their IoT will be professionally supported and maintained.

The benefits of deploying state-of-the-art RTLS monitoring software along with remote diagnostics, updates, and configuration are significant. They include:

- **Visibility:** Dashboards allow for simple visualization of system functionality and health, including map views and menu-driven functionality. The latest systems can provide real-time system performance information as well as tag and infrastructure signal strength and battery status information.
- **Data Management and Configuration:** Data can be displayed based on user-determined parameters. Queries can be easily created, saved, and shared, allowing for greater capacity to mine and analyze data.
- **Uptime:** Combined with remote monitoring performed with RTLS technical staff, these systems can deliver improved uptime and low-to-zero routine system maintenance rates for the contracting facilities. Through advanced mapping capabilities, advance platforms such as SenseView can pinpoint the exact location of system issues thereby enabling rapid, focused service.
- **Confidence:** Real-time knowledge that a system is performing optimally at any given time.
- **Flexibility:** Remote monitoring eliminates the need to remain at a fixed location to monitor or control technologies linked through the IoT allowing facilities to best manage resources and capacity.

Even the most exciting technologies must achieve reliability before they can be effectively and reliably utilized for maximum impact. By supporting RTLS with remote monitoring and synthesizing the resulting data for users, innovative manufacturers are helping health care facilities put RTLS to work on the industry's core issues such as improved efficiency, quality, safety and financial outcomes.