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Technology for Safer, Smarter Organizations

[Whitepaper]

Introduction to Real-Time Locating Systems (RTLS) for Safety, Security and Operational Efficiency

Part 1 of a 3 Part Series: RTLS for Safety, Security and Operational Efficiency

- *Part 1 of this series offers an overview of RTLS in healthcare and university settings. Use case examples are highlighted to help organizations ascertain whether RTLS could be right for them.*

- *In Part 2, we'll address the importance of being as inclusive as possible in the decision-making process throughout a variety of departments. This will ensure the system functions as envisioned and that organizations are able to optimize the benefits; scale as needed and get the maximum return on investment of a n RTLS system customized to their specific needs.*

- *Part 3 will describe e the pros and cons of a variety of RTLS technology options, including Wi-Fi RTLS for locating assets to a building or zone and the ability to combine multiple technologies that can be leveraged for a variety of high-value uses (e.g. Patient Tracking /Protection, Wireless Staff Duress, Asset Tracking, Workflow* Optimization, etc.)

Background

Real-Time Locating System (RTLS) is an umbrella term that includes multiple technologies for locating and tracking items in various operating environments, including healthcare, government and university settings. An RTLS solution uses data transmitted from RFID tags or sensors placed on items or carried by people, to convey the current location and / or condition of tracked items to a software system. This location and condition information delivers both actionable information for immediate decision making and response, as well as reporting and analytical analysis for long-term decision making.

There are a wide range of potential use cases ranging from tracking of long-term care residents who are at risk for wandering, enabling mobile panic alert systems, tracking patients in outpatient and inpatient settings to improve patient flow and enabling the efficient use of resources. RTLS can be designed to enhance safety for individuals with alerting capabilities in a wide range of settings including health care and universities, and it can be designed to track critical equipment to prevent loss, and improve efficient use of available equipment. There are many other emerging use cases including hand hygiene, nurse rounding, and temperature monitoring to name just a few.

An RTLS solution designed well for the needs of a particular facility can provide substantial benefit. Far beyond the obvious value of finding and managing high value assets, if implemented and utilized correctly, such a system can improve patient and staff experience; enhance staff, patient and / or student safety and security; improve organizational efficiency and reduce costs.

The Problem: Insufficient Visibility

An accurate and reliable RTLS allows users to know the precise location of anything that is tracked on a second by second basis and can be leveraged for a variety of applications: RTLS can answer the questions:

- Where are my resources currently located (people, assets)?
- What are they doing right now (need assistance, waiting, in use, etc.)?
- How have my resources been used over time?
- How can I improve?

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Typical RTLS Examples:

At-Risk Patient Tracking

In healthcare, RTLS allows for improved real time tracking of at-risk patients. With traditional wander-guard systems, staff are alerted only when a patient or resident triggers an alert at an exit. RTLS takes this several steps further with features that actively assist staff in keeping patients safe, allowing them to know the individual might be approaching or leaving the area.

RTLS can further be integrated to other systems to instantly and automatically disable doors and elevators as well as activating CCTV cameras in the area where the alert has been triggered. And, in instances where a breach does occur, RTLS solutions exist that can continue monitoring the patient location even outdoors eliminating a tense and dangerous exhaustive facility search. These actions drastically reduce the potential for at risk patients to wander outside of their desired area and the ability for staff to ensure their safety and return them to the appropriate clinical supervision within minutes.

Wireless Duress Alerting

Safety is a top priority for all businesses, but in healthcare and university settings, preventing personal assaults of vulnerable staff and students is paramount. Healthcare workers continually become the subjects of patients, family members or inmates' rage, confusion or anxiety. Studies show over and over again that violence against healthcare workers has become a rising epidemic (https://nurse.org/articles/workplace-violence-in-nursing-and-hospitals).

On university campuses large and small, parents and students want to know what steps the campus takes to keep students safe. Although campus active shooting incidents are rare, they have risen nationwide; and in recent years, sexual violence has probably become the most discussed campus crime issue (https://www.usnews.com/education/best-colleges/articles/2019-09-19/what-students-should-consider-about-campus-safety-wellness).

Traditional panic alert systems provide fixed devices that allow individuals to alert police and security they are in distress. This of course assumes the individual(s) are, or can remain, at that fixed location when they need police assistance. Since that is often not the case, RTLS provides a mobile alternative.

With RTLS, a panic button is integrated into a custom tag, worn or carried individuals. The panic function is activated by simply pressing the button to instantly notify security that the individual is in danger and indicating his or her precise location. This information is transmitted whether the individual is indoors or outdoors, virtually anywhere while on the grounds of an RTLS-enabled facility.

Their specific location will be displayed in dispatch and communicated to responding officers or other staff via pagers or other mobile devices. For facilities utilizing CCTV cameras, the RTLS information can be integrated to stream video from the nearest cameras associated with the alerted location to the front monitor in the security office so that responders can have "eyes on" the situation.

Healthcare Asset Management Example (Source: Integra Systems, Inc.)

With thousands of assets a healthcare network owns across the hospital enterprise, RTLS provides access to a wealth of information regarding those assets including:

1. The item's current location
2. The utilization of that item. (Has it been stored in a utility closet for the past year?)
3. The status of that item. (Is it in use in a patient room, sitting in the biomed department waiting for service, or sitting in a clean storage available for use?)

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With the added visibility into location and movement RTLS provides, hospitals can have much better information regarding actual asset utilization with the ultimate goal of improving supply chain throughput. Leveraging assets across the enterprise now becomes realistic. Moving assets from areas of low utilization to areas of higher utilization, when demand outstrips capacity, becomes a very real opportunity. Those hospitals can further avoid rental fees, reduce purchase of surplus equipment to meet demands and reduce inefficiencies in asset processing.

Summary: RTLS Technology Options - What Do You Really Need?

The RTLS market has become a crowded space. There is a plethora of differing technology solutions to solve the unique requirements for location tracking of people and equipment. RTLS can include a number of location identification technologies including Wi-Fi-based location identification, active and passive Radio Frequency Identification (RFID), infrared and ultrasound.

Any organization considering an investment in RTLS should carefully consider the problems they are trying to solve and understand the options available. Different technologies or combinations of technologies provide differing degrees of location resolution (in a building, within a zone, within a specific room, or with precision to a specific area with a room). Some work indoors only while others can provide locating both indoors and outdoors. RTLS location data can also be integrated to other software and building systems; for example, to lock elevators and doors, activate CCTV or document patient:staff interactions.

An RTLS solution designed with the right technology for the right use cases, can address important business issues such as safety and security applications, proactive asset management (locating equipment assets and workflow automation) and performance of time and motion studies for process improvement activities.

If you're interested in learning more about how RTLS may be able to help your organization, we would be happy to assist with business case development and planning for your unique challenges. Contact us at 856-371-3764 or get in touch at support@mgm-solutions.com

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About the Author

Mauer has over 30 years' experience in software development, RFID and related technologies. He holds patents for triangulation, Intelligent Boundary Recognition, AutoCAD (vector) floor/site plan displayer, and RFID/GPS/Cellular integration. His SecurTRAK solutions have been used in private hospitals since 1996 and in the VA since 2002, accurately tracking patients, staff and assets indoors/outdoors. He served 6 years in the US Navy as a Computer Systems Engineer which included support for Naval Tactical Data systems, Crypto communications, Gun and Missile Fire Control systems, and related Radar Systems. His post Naval positions include Field Engineer at Intergraph Corporation, VP Information Systems at Medarc and IT Director at Triad Technologies (Biotechnology Corp.)

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