COGNOSOS
HEALTHCARE

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How AI Changed the RTLS Game

Increase efficiency, improve safety, and elevate care with **Cognosos' LocationAI®**

Introduction

Patient health and satisfaction are top priorities for hospitals, but they're hard to achieve when staff attention is focused on other issues. These issues include the inability to find equipment and the stress caused by increases in healthcare workplace violence. An accurate and dependable real-time location solution (RTLS) can help hospitals address both pressing challenges.

Yet when many hospital leaders think about purchasing an RTLS, they remember previous technologies' complexities and failures. Some real-time location systems can deliver a high degree of accuracy, but are expensive and require disruptive installation. Others are less expensive and easier to install, but aren't accurate enough to meet a hospital's needs. In both situations, hospitals struggle to realize the ROI they were promised when they signed their RTLS contracts.

Thanks to advances in artificial intelligence and machine learning, hospitals don't have to sacrifice performance for price anymore. The Cognosos RTLS, powered by LocationAI, can deliver industry-leading accuracy with ultra-light infrastructure and a lower total cost of ownership than almost any other solution on the market. With LocationAI as the location engine, Cognosos helps hospitals increase efficiency, improve safety, and elevate care—all at an affordable price point.

LocationAI overcomes RTLS' traditional shortcomings

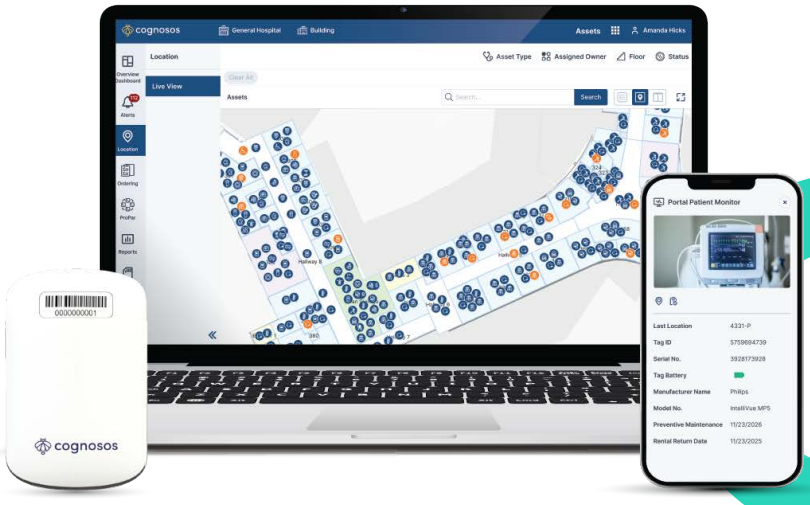
Older RTLS technologies, like infrared and ultrasound, have high implementation costs and run on heavy and expensive infrastructure. The installation of these solutions—during which wires must be pulled through the ceiling and equipment must be placed in every room—is disruptive and time-consuming. The process can take patient rooms and operating rooms offline for days at a time, adding burden to hospital staff and strain to their normal duties, which can impact patient care.

Beyond these costly installation hurdles, older RTLS technologies generally can't achieve high levels of accuracy in open spaces and are subject to expensive revisions whenever a hospital changes its physical layout. Without further investment from the hospital to account for the layout changes, the accuracy and usefulness of the older RTLS technologies wane.

Newer RTLS technologies, like Bluetooth Low Energy (BLE), usually have lower implementation and installation costs than older RTLS solutions however that tradeoff comes with poorer accuracy.

For decades, hospitals had to make difficult tradeoff decisions between performance, limited deployments or excessive expense. Cognosos' cloud-based solution harnesses LocationAI as its location engine, which allows for an ultra-lightweight infrastructure that dramatically lowers the hardware expense and alleviates compromises between performance, scope and excessive expense. The entire solution can be installed quickly and with minimal disruption throughout a hospital. This allows Cognosos to deliver hospital-wide, room-level accuracy with high confidence, all while providing a fast path to ROI.

Cognosos cloud-based LocationAI and ultra-lightweight infrastructure changes the game and alleviates the need to compromise.



Under the hood: How LocationAI works

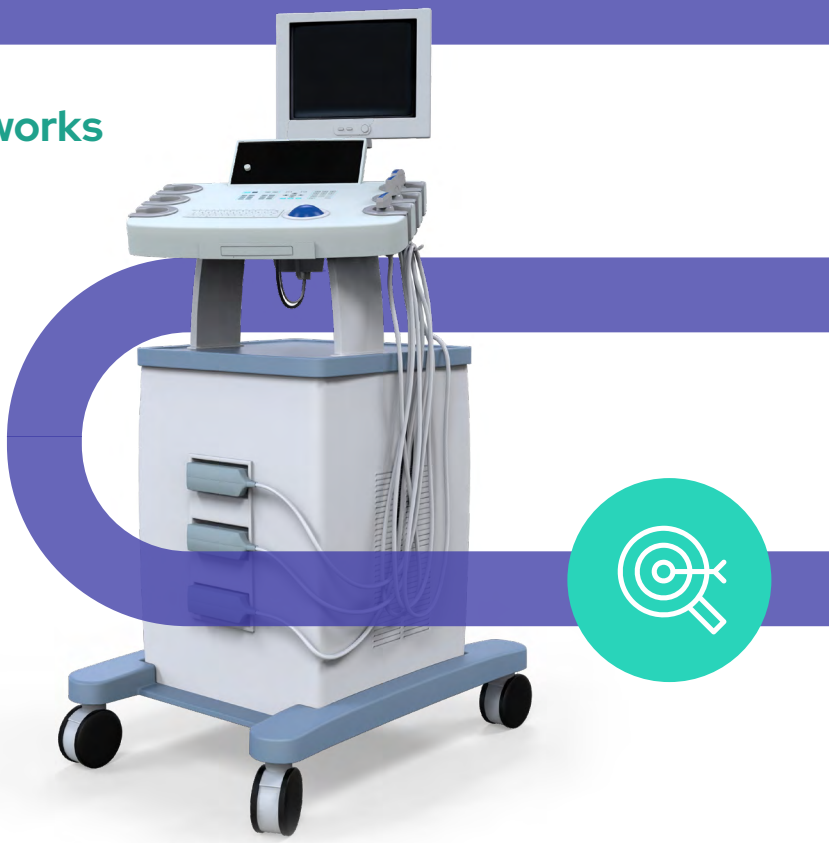
In action, the Cognosos RTLS works like this:

Battery-powered BLE beacons are placed infrequently throughout the hospital, parking lots and garages, and pathways. They send signals from their locations.

Medical-grade tags placed on mobile equipment collect a combination of signals from the nearest beacons.

Internet-enabled gateways receive information from tags within a 100,000-square-foot range.

LocationAI acts as the location engine by receiving the information from the gateways, comparing it to an internal reference network of the hospital's footprint and determining the tags' exact location.



SOFTWARE REIGNS SUPREME

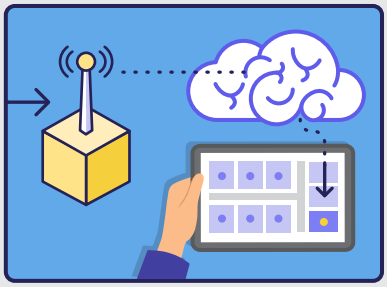
Hardware is clunky, time consuming to install and one more thing to maintain. Cognosos' LocationAI system relies less on hardware and more on software, increasing efficiency and accuracy while lowering cost over time.

LOCATION TRAINING

During a one-time walk through with handheld equipment, data is collected and assigned to zones.

LOCATION ENGINE

The AI algorithms produce the reference network with which the tag information will be compared.



LOCATION VISUALIZATION

LocationAI displays the location with room-level accuracy based on the initial training at implementation.

UNIQUE TRACKING TAG
Placed on all equipment

BEACON
Placed in hallways

INTERNET GATEWAY
Placed one per floor

LOCATION AI
Cloud-based system

LocationAI's internal reference network is built with machine learning algorithms (see the sidebar for a quick explainer on how machine learning works). During implementation, a member of the Cognosos team will train LocationAI by navigating the facility and sending distinct signal combinations. These signal combinations are then associated with locations such as Room 1 or Room 2.

Later, when LocationAI receives information from a tag in Room 1 and compares it against its reference network, it can say with confidence: "This combination matches up with what I know to be Room 1, so the tag is located in Room 1, not Room 2." This is how Cognosos can deliver such high-confidence accuracy while using ultra lightweight and inexpensive infrastructure.

LocationAI helps avoid network decay associated with legacy RTLS technologies. When a hospital layout changes, either through renovation or expansion, older RTLS technologies need to upgrade their system which typically includes installing new wiring and hardware at a substantial cost to the hospital. LocationAI dramatically minimizes the work and disruption needed to incorporate the new spaces.

DEMYSTIFYING AI

To understand how machine learning works, think about the process of image recognition. A computer is fed many images of a dog and told, "This is a dog." Then it's fed many images of a cat and told, "This is a cat." The computer creates an internal reference scale of "dog-ness" and "cat-ness." Later, when it's presented a new image of a dog, the computer compares it against the scale and can say, "This image matches up with 95% of what I know to be 'dog-ness,' so it's a dog."

Everything's easier with LocationAI: Asset management and staff safety benefits

There are many downstream benefits that become apparent once a LocationAI-powered Cognosos RTLS is up and running, including:

OPTIMIZING ASSET MANAGEMENT

Identifying workflow efficiency and areas of improvement

Cognosos allows clear **insight into a mobile equipment fleet's** utilization. Hospitals can easily find where bottlenecks in their workflows exist and **take action to fix them**. For example, imagine that the nurses on the fourth floor of a hospital have reported a shortage of bladder scanners. The hospital checks its Cognosos data and finds that the bottleneck seems to be in central cleaning. The hospital can make changes to its central cleaning protocol to prioritize bladder scanners when they arrive and ensure staff expedite their return to the fourth floor's clean storage room.

Automating replenishment processes

LocationAI is an essential element of Cognosos' **ProPAR capability**. This function allows hospitals to proactively set minimum periodic automated replacement (PAR) thresholds for clean and soiled storage rooms. When LocationAI detects that these rooms are nearing a preset level, Cognosos can send automatic alerts to hospital equipment staff, prompting faster replenishment or service times.

Making data-driven purchasing decisions

LocationAI produces **actionable utilization data** that can help hospitals right-size their inventory and make better purchasing decisions. For example, imagine a hospital has a fleet of 1,000 infusion pumps that can cost $5,000 each. Nurses report a shortage of these items and have asked the hospital to buy 200 more. Before rubber-stamping the purchase, the hospital first consults its Cognosos data. It finds that the fleet's average utilization rate is 60 percent — even at its busiest time, the hospital has at least 400 infusion pumps sitting unused. Instead of purchasing the new items, the hospital makes changes to its infusion pump cleaning workflow to make the items more readily available for nurses. The hospital avoids a $1-million purchase — and nurses have better access to the equipment they need.

PEACE OF MIND FOR FRONTLINE WORKERS

Covering the entire hospital campus

Healthcare workplace violence doesn't just happen inside a patient room. An assailant may place staff and patients in danger in a hallway, stairwell—or even in a parking lot, garage, or outdoor pathway. Thanks to LocationAI, Cognosos is one of the only RTLS providers that goes beyond the four walls and **covers the entire hospital campus**. Nurses, doctors, and other hospital staff can work confidently, knowing that help is only the press of a duress button away whenever they need it.

Sending emergency alerts discreetly

Cognosos' staff badge was designed to blend in with the other hospital badges to allow staff to press the button with discretion as to not draw the attention from the assailant and escalate the situation. Once pressed, the badge confirms with a silent vibration to inform the staff that help is on the way.

Pinpointing incident locations—even on the move

Once a staff duress badge button is pressed, LocationAI will locate the badge as long as it's activated, inside or outside the hospital. Safety personnel can respond to the incident's current location—not where it was happening minutes ago when the duress button was initially pushed. This is **critical when the** assailant has a staff member or patient in tow.

Get RTLS done right with Cognosos and LocationAI

Whether a hospital is shopping for an RTLS for the first time or looking to upgrade its current solution, it's essential that decision-makers understand the seismic technological shift that's occurred in the sector over the past several years.

AI and machine learning have made it possible for RTLS to overcome prior shortcomings. But not all RTLS solutions that claim to incorporate AI are doing so in an effective way. With LocationAI as the location engine, Cognosos is at the cutting edge of this technological shift — and it's a significant reason why hospitals are making the switch.

Jamaica Hospital Medical Center in Queens, N.Y., selected Cognosos specifically because its combination of AI and ultra-lightweight infrastructure delivered better accuracy than competing products they considered. The implementation of an AI-based asset management system is in keeping with Jamaica's innovative spirit, says Nabil Ibrahim, JHMC's Director of Biomedical Engineering and Asset Management.

"We've already been contacted by other hospitals who've embraced the older technologies and are now considering replacing them, which means we're really on the right track," Ibrahim says of JHMC, which is now expanding its application of Cognosos.

The best way to learn how LocationAI and Cognosos can help overcome your hospital's asset management and staff safety challenges is to see it for yourself. Contact us today to schedule an on-site demo.

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