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Real-Time Location Systems: Success Stories in Industrial Settings

Connected Worker for 10,000 Workers on Global EPC Provider Construction Site



Key Challenge

In this case study, we examine how a client managed a workforce of over 10,000 employees and subcontractors in a large, 1 square kilometer fabrication yard in the United Arab Emirates. The site's complex layout, harsh conditions, and constant changes posed significant challenges. Managing such a dynamic environment required innovative solutions to ensure efficient operations and worker safety. This background introduces the application of Real-Time Location Systems (RTLS) to streamline operations and enhance safety in demanding construction settings.

Solution

Litum's RTLS solution leveraged Ultra-Wideband (UWB) technology for precise location tracking, seamlessly integrating with the client's HR systems to enhance timekeeping, payroll, and safety compliance. Sophisticated monitoring and alerts addressed safety risks like free-fall incidents and unauthorized area access, while a business rule engine and workforce management dashboard provided actionable insights and analytics to support decision-making.



Features



Automated Time and Attendance: Streamlining the logging of employee hours directly into the system



Safety Monitoring: Including emergency buttons and detection systems for falls and immobility, crucial for rapid response in accident scenarios

Workforce and Resource Monitoring: Real-time tracking of employee locations and assignments, along with resource tracking and allocation for ongoing projects



Payroll Integration: Automating the calculation and processing of payroll based on accurate work time data

Results

The deployment enhanced safety and operational efficiency significantly. By integrating real-time alerts and wearable safety devices, the client eradicated work-related accidents, ensuring an uninterrupted workflow and on-time project delivery. This proactive safety approach, coupled with optimized resource allocation and the reduced accident-related costs led to

over \$1 million in savings within the first year.

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Connected Worker for 5,000 Workers on Nuclear Plant Construction Site



Key Challenge

A leading construction company in Europe was tasked with ensuring operational efficiency and safety at one of the world's largest nuclear construction projects, set to become the first of its kind in the region. Given its large and dynamic workforce, the company needed a reliable system to track employee locations in real time. The primary goals were to enhance productivity, improve overall site safety, and ensure regulatory compliance.

Solution

Litum delivered a comprehensive connected worker solution featuring 5000 Bluetooth Low Energy (BLE) tags worn by employees as bracelets. This system enabled precise real-time location tracking across the site. BLE anchors and gateways, powered by solar panels, ensured sustainable and uninterrupted operation. Additionally, the solution included detailed reporting and analytics, providing the construction company with enhanced visibility into workforce movements and site safety.

Deployment

55,000 square meter area

5,000 workers

*The numbers indicated are as of May 2024. Expansion with the client continues.

Features



Workforce and Resource Monitoring: Real-time tracking of employee locations, along with overall resource allocation

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Automated Time and Attendance: Streamlining the logging of employee hours directly into the system

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Zone Monitoring: Tracking entries and exits in specific areas to ensure adherence to safety protocols

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Geofencing: Setting virtual boundaries and alerts for unauthorized entries or exits, enhancing security



Safety and Efficiency Dashboard: Centralized platform with reports for zone transactions, tag battery levels, spaghetti diagrams, and heat maps for monitoring and decision-making



Results

The implementation of Litum's connected worker solution at the nuclear construction site resulted in significant improvements in both operational efficiency and safety. By leveraging 5000 BLE tags for real-time location tracking, the company achieved a **20% increase in workforce productivity.** Automated time and attendance logging streamlined administrative processes, reducing manual entry errors and **saving an estimated 15 hours per week in administrative work.** The real-time monitoring capabilities and safety features, such as emergency buttons and fall detection systems, led to a **25% reduction in emergency response times,** enhancing overall site safety and ensuring compliance with stringent regulatory standards.

In terms of return on investment (ROI), the company saw substantial cost savings and operational benefits.

The solar-powered BLE anchors and gateways ensured uninterrupted operation with minimal maintenance costs. Enhanced visibility into workforce movements and resource allocation improved project management, leading to a 10% reduction in project delays. The geofencing and zone monitoring features prevented unauthorized access and ensured adherence to safety protocols, further reducing the risk of costly safety violations.

Overall, the comprehensive tracking solution provided by Litum not only met the company's primary goals but also delivered a robust ROI by **optimizing resource utilization, enhancing safety, and ensuring regulatory compliance.**

Asset Tracking for 1,500 Mobile Assets in Multinational Healthcare Services Warehouse



Key Challenge

In a bustling warehouse located in Mexico, managed by a multinational healthcare services provider, the task of overseeing over 1,500 mobile asset cars through multiple zones presented complex logistical challenges. The dense arrangement of these assets, combined with a dynamic environment filled with numerous workers and products, called for an efficient solution to locate specific cars quickly. Manual search processes were slow and error-prone, complicating operational flow. Ensuring that each car accurately moved through designated zones and monitoring the time each spent in these zones were crucial for maintaining efficient workflow and confirming procedural adherence.

Solution

To tackle these challenges, Litum implemented an RTLS-powered asset tracking solution that included the installation of over 1,500 compact tags on the mobile asset cars. To ensure extensive coverage and seamless data communication, 68 anchors and 17 gateways were strategically placed throughout the facility. The RTLS was configured to refresh location data every 30 seconds, a setting that optimized the accuracy of asset locations and ensured that the whereabouts of each car was precisely documented. This robust setup streamlined the identification and tracking of specific assets and enabled the precise monitoring of their movements through designated zones, ensuring an organized and efficient asset management process.

Features

Real-Time Asset Tracking: Real-time tracking of mobile assets with sub-meter accuracy, using Ultra-Wideband (UWB) technology

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Zone Monitoring: Providing detailed insights into the movement and dwell times of asset cars within the facility's 10 operational zones, ensuring compliance with the intended sequence and progression

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Tag and Battery Status Monitoring: Continuous monitoring of the health and battery status of each tag and providing timely alerts to maintenance teams to address potential issues before they affect operations

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Efficiency and Reporting Dashboard: Detailed analytics and reports for zone-based activities, battery status, maintenance alerts, and historical movement



Results

Litum's solution led to a 90% reduction in the time employees spent searching for assets, greatly enhancing operational efficiency. The solution provided precise insights into asset location and movement, significantly improving inventory accuracy and management. These improvements bolstered operational workflows, supported strategic resource allocation, and enabled more informed decision-making. Accounting for decreased labor demands, improved asset utilization, reduced downtime and additional KPIs, altogether, these advancements translated into an annual cost reduction of nearly \$350,000.

Asset Tracking Solution for Leading Aerospace and Defense Company in Europe



Key Challenge

A leading aerospace and defense company in Europe faced significant challenges in maintaining operational efficiency due to the manual tracking of equipment within their facility.

The existing process was time-consuming, error-prone, and led to delays in production. These inefficiencies were amplified by the lack of visibility into the real-time location of assets, making it difficult to ensure that equipment was in the right place at the right time.

Solution

Litum provided a UWB-based RTLS asset tracking solution to monitor the location of 3,000 assets, delivering accurate, real-time data on their movement within the facility. The system included features like heat maps and advanced reporting, offering actionable insights into asset usage to help streamline workflows. Integration with SAP ensured that physical and digital asset records were always in sync, while a mobile-friendly application gave staff quick and easy access to essential data anytime, anywhere.

Features

Real-Time Asset Tracking: Tracking asset locations in real time to reduce the time spent searching for assets

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Asset-Barcode Matching: Associating physical assets with digital records for streamlined management

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Mobile Application Integration: On-the-go access to asset locations and reporting features

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SAP Integration: Linking RTLS data with SAP to synchronize physical assets with digital records

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Efficiency and Reporting Dashboard: Comprehensive real-time insights, including heat maps and asset movement reports, to analyze operational workflows and enhance decision-making with actionable data



Results

Litum's solution significantly enhanced operational efficiency by optimizing asset utilization and drastically reducing time spent on manual searches. The system **improved asset utilization by an estimated 10%**, leveraging location data to ensure better use of existing resources. Real-time tracking **reduced the time spent searching for assets by up to 70%**, streamlining workflows and minimizing delays. These improvements accelerated production cycles as well as reinforcing the client's position as a leader in the aerospace industry. These efforts culminated in an estimated yearly cost saving of \$420,000.

Forklift Safety and Efficiency Solution for Fortune 50 Retailer



Key Challenge

In warehouses, productivity is greatly determined by the performance of powered industrial trucks (PIT), or forklifts as they are more commonly known. This North American client needed their forklifts to work at optimum speed while they ensured workplace safety. This required visibility into real-time location of forklifts and setting up of business rules in line with desired safety and efficiency outcomes based on their movements.

Solution

Leveraging ultra-wideband technology, we deployed an integrated forklift safety solution based on real-time location systems across the client's multiple warehouses. This comprehensive solution is based on a mesh network that includes tags and strategically positioned anchors and gateways that enable wireless communication between devices to enable precise location tracking. Robust signal transmission and seamless data flow have been possible through these mesh networks, enabling operational visibility for all involved.

The addition of an advanced speed control feature has enhanced the system's capabilities, enabling proactive forklift safety. Depending on the vehicle type and specific zone rules within the warehouse, the system can trigger the Electronic Control Unit (ECU) of the forklifts to adjust their speed. This intelligent feature was instrumental in enhancing safety, as it allowed for dynamic speed regulation in different warehouse zones, effectively minimizing the risk of collisions.

Deployment

30,000,000+ square feet area

7,000+ forklifts

*The numbers indicated are as of January 2024. Expansion with the client continues.

Features

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Full RTLS deployment establishing a comprehensive mesh network for alerts, speed control, and complex business rule implementation

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Networked solution employing an **Ultra-Wideband (UWB)** network for precise forklift tracking and environmental control

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Real-time tracking of speed data, idle time, forklift height, and battery status

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Proximity alerts for operators and pedestrians

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End-of-aisle slowdown to enhance safety in critical areas



Crosswalk identification to electronically mark pedestrian crosswalks or other designated pedestrian areas and customize system response for safety, including automated slowdown of the vehicles

Autonomous speed control allowing for automatic reduction in forklift speed near other tagged entities to improve safety



Exclusion zones/geofences for electronically designating areas as forklift or pedestrian exclusions, adaptable to various operational requirements

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Data analytics and reporting for insights that enable better decision making and identify traffic patterns, bottlenecks, and safety issues

Results

The client:

- **Reported 100% reduction** in forklift-related accidents since Litum deployment
- Was announced a finalist for innovation in the National Safety Council Green Cross for Safety Awards after deploying Litum's solution
- Decided to extend the deployment to 37,000+ additional forklifts and 650+ sites worldwide in the longer term, seeing the clear, real ROI of the solution
- **Complies with local regulations,** leading to business continuity
- Has safer and more efficient warehouses with better employee satisfaction and business profitability as a result of reduced risk of collisions and downtime



Forklift Safety and Efficiency Solution for Fortune 500 Automotive Manufacturer



Key Challenge

A Fortune 500 automotive manufacturer faced operational inefficiencies with its extensive fleet of forklifts within a 500,000 square foot section of their Mexican plant. The challenge was to enhance asset management, optimize routing, and reduce operational costs while maintaining a high standard of safety and compliance within a fast-paced and strictly scheduled environment, which posed significant risks for accidents and inefficiencies.

Solution

Litum deployed a comprehensive RTLS solution to address these challenges. By integrating Ultra-Wideband (UWB) technology, the system ensured accurate routing and efficient utilization of forklifts. The solution featured an automated route optimization function that utilized historical and real-time movement data to dynamically adjust forklift paths to minimize travel times and prevent bottlenecks. Moreover, the RTLS solution offered extensive data analytics capabilities, providing detailed reports on vital metrics.

Features

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Real-Time Tracking: Continuously monitors forklift locations, enhancing operational adjustments and forklift visibility

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Automated Route Optimization: Uses real-time and historical data to dynamically optimize forklift paths, reducing travel times and improving efficiency

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Safety and Collision Alerts: Issues proactive warnings to prevent potential collisions, significantly enhancing forklift safety

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Idle Time Monitoring: Identifies and analyzes idle periods to reduce unnecessary energy consumption and improve efficiency

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Load Status Identification: Monitors whether forklifts are loaded or unloaded, aiding in task prioritization and load balancing

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Customizable Operational Dashboards: Features adaptable dashboards that provide essential metrics and insights for informed decision-making

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Data Analytics and Reports: Offers detailed reports on efficiency, safety, and asset utilization to support ongoing improvements

Results

Litum's deployment resulted in a significant boost in forklift utilization, with the client's operational efficiency

improving by 35-55%.

The solution also significantly improved safety within the facility, leading to a substantial reduction in incidents and fostering a safer working environment.

Crane Safety Solution for Fortune 500 Global Steel Manufacturer



Key Challenge

A leading global steel manufacturer headquartered in Europe encountered significant challenges in enhancing workforce safety across their extensive warehouse operations. Previous critical safety incidents highlighted the need for improved safety measures, particularly in crowded environments where cranes moved heavy products, creating high-risk conditions. The company aimed to ensure that no personnel were present in crane movement areas during operations to mitigate risks and prevent accidents efficiently. They sought a solution that could be integrated into a single badge to address multiple safety and operational needs.

Solution

Litum deployed a comprehensive safety solution tailored to the unique challenges of the steel manufacturer's workspace. The system included multiple sensors on each crane to enable 360-degree detection, ensuring that no personnel were present under the cranes during operations. If movement was detected, an alarm would sound to alert the crane operator. To enhance safety further, the solution featured a collision warning system to help prevent accidents involving cranes, forklifts, and personnel.

Features

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360-Degree Detection: Sensors on each crane provide complete detection coverage, ensuring no personnel or obstacles go unnoticed

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Collision Warning: Real-time alerts to mitigate potential collisions between cranes, employees, and forklifts

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Exclusion Zones and Geofencing: Establishing designated safety zones to prevent unauthorized access and manage personnel movement effectively

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Integrated Alerts: Synchronized alerts across controllers and mobile devices for immediate and coordinated response to potential safety issues

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Access Control Automation: Automated access controls for building and campus entrances to enhance security and streamline traffic flow

Deployment

23,000 square meter area

*The numbers indicated are as of July 2024. Expansion with the client continues.

Results

The implementation of Litum's solution significantly enhanced workplace safety. Real-time alerts provided **comprehensive protection for employees under operational cranes,** mitigating accident risks in these vital areas. The collision warning system effectively reduced incidents involving cranes, forklifts, and personnel, promoting a safer environment. Before the solution's deployment, accident risks were notably high, but post-deployment, **workforce safety reached 100%.** Automation of access control and geolocation integration streamlined operations, saved time, and reduced administrative burdens.

Emergency Mustering Solution for Multinational Confectionary Company



Key Challenge

Ensuring the safety of over 1,200 personnel and visitors during emergencies at Ferrero's facilities in Europe presented a substantial challenge. Manual counting methods were time-consuming and prone to errors, making it difficult to account for every individual accurately and promptly during crises. The dynamic nature of personnel attendance and visitor circulation further complicated accurate headcounts at mustering points, especially in the chaotic environments typical of emergency evacuations.

Solution

Ferrero adopted Litum's emergency mustering solution to enhance the speed and accuracy of personnel and visitor accounting in emergency situations. The system utilized battery-powered badges equipped with BLE (Bluetooth Low Energy) technology as a replacement for Ferrero's traditional ID badges. These badges facilitated real-time data transmission to Litum's dedicated mobile application, streamlining the process of tracking and documenting the presence of individuals on-site during emergencies.

Features

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Self-Sufficient Badges: Sleek, lightweight badges that do not require infrastructure or external power, offering flexibility and ease of deployment.



Mobile App Integration: Utilizes a mobile app that allows safety officers to quickly scan badges using BLE technology within a range of up to 50 meters.

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Real-Time Updates: As individuals report on-site or leave, the system updates employee and visitor rosters in real time, ensuring accurate, up-to-date headcounts

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Audit-Ready Reports: Tracks and records the number of practice drills and actual emergencies, along with detailed timing and outcomes for compliance and review



Results

Litum's emergency mustering solution transformed Ferrero's evacuation exercises, making the process

70% faster than the previous manual procedures.

This efficiency not only reduced the time needed to ensure all personnel were safely evacuated but also streamlined the reporting processes, significantly enhancing safety compliance and regulatory fulfillment at Ferrero's sites. The system's ability to integrate with existing time and attendance software has also improved internal audit capabilities, further bolstering Ferrero's commitment to safety and efficiency.

Lone Worker Safety Solution for Underground Tunnel Construction



Key Challenge

As the Paris Metro expanded its underground rail line, it faced the challenge of ensuring worker safety in harsh tunnel environments with limited access and exposure to hazards such as fire and air contaminants. The project required a system that could operate continuously under these conditions while complying with strict safety regulations to allow only authorized personnel in restricted areas.

Solution

Litum developed a tailored safety solution featuring battery-operated UWB tags, anchors, and gateways that operated on a mesh network structure installed throughout the tunnel construction area. This network supported Litum's high-precision positioning technology to provide sub-meter location accuracy. The system was integrated with the company's time and attendance systems to ensure accurate headcounts and was designed to function seamlessly despite the challenging underground conditions.

Features

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Workforce Location Insights for Safety: Real-time insights into workforce locations within the construction zones for immediate pinpointing of workers in case of an emergency



Zone Monitoring: Automatically monitoring different areas within the site for compliance with safety standards and operational effectiveness

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Access Control: Managing entry to restricted areas, ensuring that only authorized personnel have access

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Proximity Alerts: Alerting workers when they are too close to heavy machinery to reduce the risk of accidents

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Duress Alerts: Allowing workers to initiate a duress signal from their badges to prompt immediate assistance from security or safety teams

Results

Litum's deployment significantly improved emergency response times and ensured full compliance with safety regulations, **notably enhancing worker safety throughout the construction.** Real-time tracking and alerts minimized the risk of accidents and optimized the management of emergency situations, such as firefighting exercises. The solution not only **protected workers** but also facilitated **efficient emergency management and regulatory compliance**,

demonstrating a robust return on investment.





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