

RFID-Enabled Medical Asset Tracking for Warehouse Operations

Improving Visibility, Accuracy, and Efficiency in Healthcare Supply Chains

Executive Summary

Healthcare logistics operations require precise tracking of medical assets to ensure availability, compliance, and operational efficiency. Traditional warehouse processes often rely on manual tracking and barcode scanning, which can introduce delays, errors, and limited visibility into asset movement.

To address these challenges, a comprehensive RFID-based asset tracking and warehouse management solution was implemented in a medical warehouse facility in California. The system automates asset identification and monitoring across key operational workflows, including pallet verification, rack inventory checks, and monitoring the movement of assets in the warehouse at transit and exit points.

The deployment resulted in significant operational improvements including reducing pallet verification time from 3 hours to approximately 5 minutes, reducing item search time from days to minutes, and increasing inventory accuracy to approximately 99%.

1. Introduction

Medical warehouses manage large volumes of equipment, devices, and supplies that must be tracked accurately to ensure operational readiness and regulatory compliance. Manual tracking methods often lead to operational inefficiencies such as difficulty locating assets, time-consuming inventory verification, and limited visibility into asset movement.

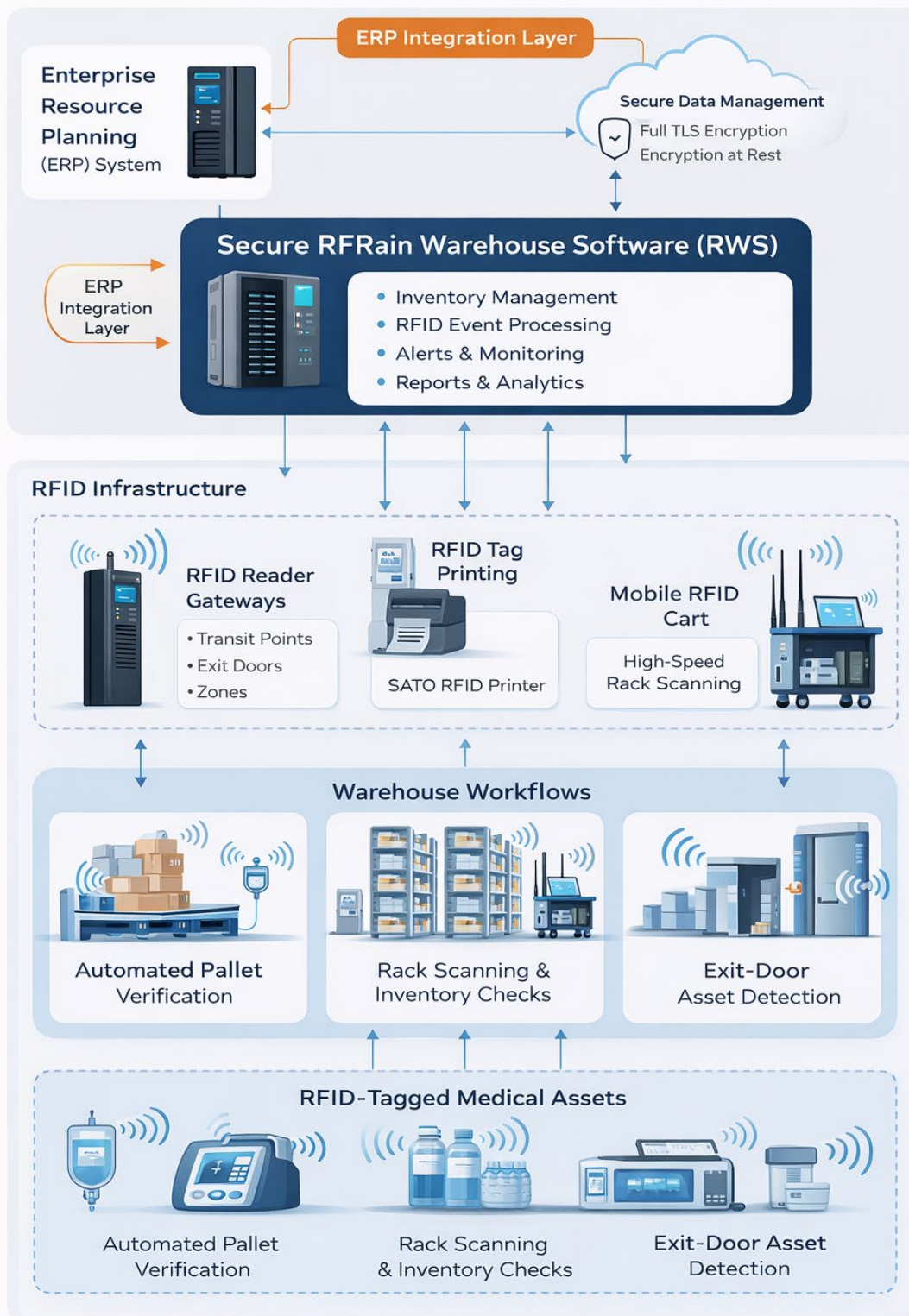
2. Solution Overview

The implemented solution uses RFID technology to automate asset tracking across multiple warehouse workflows. The system combines RFID asset tagging, RFID gateways to assist in printing tags, RFID fixed readers for doorway and transit door scanning, mobile scanning using RFID handhelds, mobile cart mast for rack scanning, RWS warehouse management software RWS, ERP integration, and secure data management.

3. System Architecture

The following diagram illustrates the architecture of the RFID-enabled warehouse asset tracking system.

System Architecture for RFID-Enabled Warehouse Asset Tracking



4. RFID Asset Tracking Across Warehouse Transit Points

RFID fixed readers were deployed across transit areas and exit doors to monitor asset movement throughout the warehouse. These fixed readers automatically detect RFID-tagged assets moving between zones and provide real-time visibility of asset movement.

5. Automated Pallet Verification

Warehouse personnel can instantly determine pallet contents using RFID scanning. The system compares scanned RFID tags against expected pallet contents to verify readiness and identify discrepancies.

6. RFID Tag Printing Infrastructure

The solution integrates RFRain gateways and SATO RFID printers to generate both standard RFID tags and metal-compatible tags for different asset types.

7. High-Speed Rack Scanning Using Mobile RFID Cart

A mobile RFID scanning cart with a 28ft mast enables staff to scan racks containing hundreds of products across multiple shelves in approximately 10 seconds, dramatically improving inventory verification efficiency.

8. Intelligent Alerts and Sensitive Area Monitoring

Custom alerting capabilities within the RWS software notify staff when specific products leave designated sensitive areas, improving asset control and loss prevention.

9. Secure Data Architecture and Cybersecurity

The system incorporates strong cybersecurity measures including TLS encryption for data in transit and encryption-at-rest for stored asset information.

10. ERP System Integration

The RFID platform integrates with the organization's ERP system through a robust interface developed in collaboration with our technology partner, ensuring accurate data exchange between operational systems.

11. Operational Impact

The RFID implementation delivered measurable operational improvements. Pallet verification time was reduced from approximately 3 hours to 5 minutes. Item search time

was reduced from days to minutes. Inventory accuracy increased to approximately 99% through regular high-speed rack scanning.

12. Conclusion

The RFID-enabled warehouse asset tracking system significantly improves operational efficiency, inventory accuracy, and asset visibility. By automating asset identification, pallet verification, and rack inventory audits, the solution modernizes warehouse operations and strengthens healthcare supply chain management.