

Strengthening Supply Chains With RFID Technology

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Poor supply chain management can cost businesses time and money many times, with issues like inventory inaccuracies, complex and laborious processes, and security concerns holding enterprises back.

Traditional supply chain management tools, like barcodes and manual counts, have limitations and can often lead to inefficiencies. And for the past several years, geopolitical and economic instability have further exposed these vulnerabilities, highlighting the need for more robust, efficient and transparent solutions.

Enter radio frequency identification (RFID) technology. Interest in the technology, which relies on radio waves for tracking and identifying items, has slowly evolved over the years, but its resurgence in interest underscores its critical role in creating more resilient, efficient and transparent supply chains.

Now, industry leaders, like Chipotle are turning to RFID technology to augment supply chain operations and better ensure compliance, security and operational optimization as they navigate an increasingly complex and digitized marketplace.

Here are six ways that RFID technology can help to future-proof supply chains.

Enhanced Efficiency and Workflow

RFID receivers can identify tags at various distances, which can reduce labor hours and improve operational efficiency by streamlining processes and enabling an enhanced customer retail experience. Modern RFID solutions have shown 10 percent to 15 percent reductions in inventory-related labor hours. In retail, they can also contribute to 1 percent to 3.5 percent increases in full-price sell-through by enabling better inventory management; reducing stockouts, shrinkage and theft; and raising revenue by up to 1.5 percent.

Improved Accuracy

RFID technology reduces annual inventory fluctuations, achieving an accuracy improvement of up to 300 percent annually. Modern RFID solutions have demonstrated more than a 25 percent improvement in inventory accuracy. In retail, RFID tags enable shoppers to scan universal product codes (UPCs) in self-checkout systems faster and more accurately. RFID capabilities also provide precise in-store inventory numbers to support

online purchases, in-store pickups, and curbside pickups, enhancing agility when responding to real-time supply chain shocks.

Increased Security and Traceability

Product authenticity and traceability are vital in industries like pharmaceuticals and grocery. RFID provides end-to-end traceability, offering product tracking throughout the supply chain. This capability is crucial for compliance with regulatory requirements and maintaining consumer trust. For instance, during product recalls, warehouse management systems (WMS) with RFID enable quicker and more accurate identification of affected lots and SKUs, mitigating risks and ensuring that only compliant products reach the market. RFID also helps verify the authenticity of high-value items prone to counterfeiting, such as luxury goods and controlled pharmaceuticals.

Long-Term Cost Savings

In the long term, RFID systems significantly reduce losses due to inventory discrepancies and enhance operational efficiency, leading to substantial cost savings over time. The average cost of a RFID tag has fallen significantly

over the last decade — by about 80 percent — and now costs about four cents for a RFID label. Additionally, read accuracy has doubled in that time, the range has more than quintupled, and RFID reader prices have dropped by nearly 50 percent.

Regulatory Compliance

RFID, coupled with WMS and also blockchain where in use, helps industries comply with regulations by enabling end-to-end supply chain tracking and reporting, guaranteeing adherence to strict standards and regulatory requirements. In the food industry, for example, Internet of Things (IoT) devices with RFID and sensors can detect and track temperature and humidity conditions for perishable goods throughout the supply chain, ensuring they remain within the required parameters. This capability ensures businesses meet standards and regulatory requirements, avoiding costly fines and legal issues — all while establishing better customer trust

Data Insights and Analytics Through Integrations

RFID also integrates well with other advanced technologies, such as IoT and artificial intelligence, offering advanced data analysis capabilities and forming a solid foundation for continuous improvement in supply chain management.

IoT devices unlock powerful data analytics capabilities, including storage conditions and movement patterns, which can be leveraged from manufacturing through distribution to retail. When analyzed, this data offers actionable insights to optimize inventory management practices, allowing businesses to make informed decisions to enhance efficiency, reduce waste, and improve overall supply chain performance.

Implementing RFID technology starts with thorough planning, mapping existing processes, and ensuring integration with

systems like ERP and WMS. That begins with a pilot program that allows for testing and scaling while attention to technological infrastructure ensures compatibility and scalability. Training and change management are crucial to adoption success, and continuous evaluation supports ongoing improvement in supply chain operations.

RFID technology has been revolutionizing supply chain operations, offering businesses unparalleled accuracy, security and efficiency. Integrating RFID with AI and IoT promises to enhance inventory management and optimize operations in a digitalized marketplace.

By overcoming implementation challenges, businesses can acquire the tools needed to meet regulatory demands, prepare for future standards, and ensure they remain competitive, compliant, and ready for the challenges ahead in an evolving business landscape.