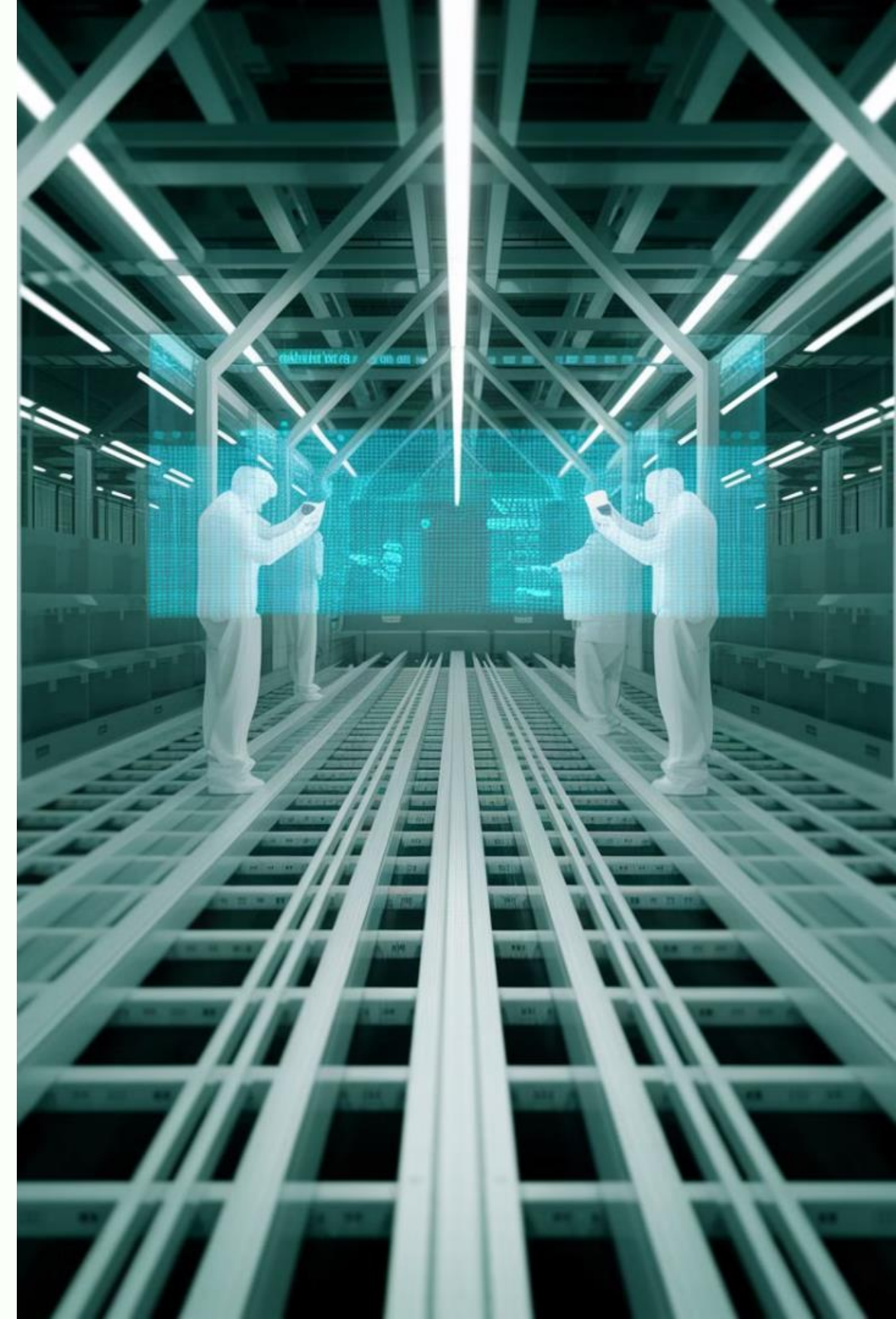


# *Integrating RFID with WMS & ERP: Transforming Warehouse Operations*

The convergence of RFID technology with Warehouse Management Systems (WMS) and Enterprise Resource Planning (ERP) solutions is revolutionizing how warehouses operate. This integration creates a powerful ecosystem that delivers real-time inventory visibility, process automation, and data-driven insights.

Throughout this presentation, we'll explore how RFID integration with WMS and ERP systems can transform your warehouse operations, examining the benefits, components, challenges, and best practices for successful implementation.

 by Kimberly Wiethoff





# *The Power of Real-Time Inventory Visibility*



## *Enhanced Inventory Accuracy*

RFID technology enables real-time tracking with up to 99.9% accuracy, drastically reducing inventory discrepancies and eliminating manual counting errors.



## *Complete Supply Chain Visibility*

Track items from procurement to delivery with end-to-end transparency, allowing for better coordination and reduced stockouts.



## *Data-Driven Decision Making*

Access real-time analytics on inventory levels, movement patterns, and warehouse performance to optimize stock levels and resource allocation.

# *Operational Efficiency Enhancements*

## *Receiving*

RFID portals can scan entire pallets simultaneously, reducing receiving time by up to 90% compared to manual barcode scanning.

## *Put-Away*

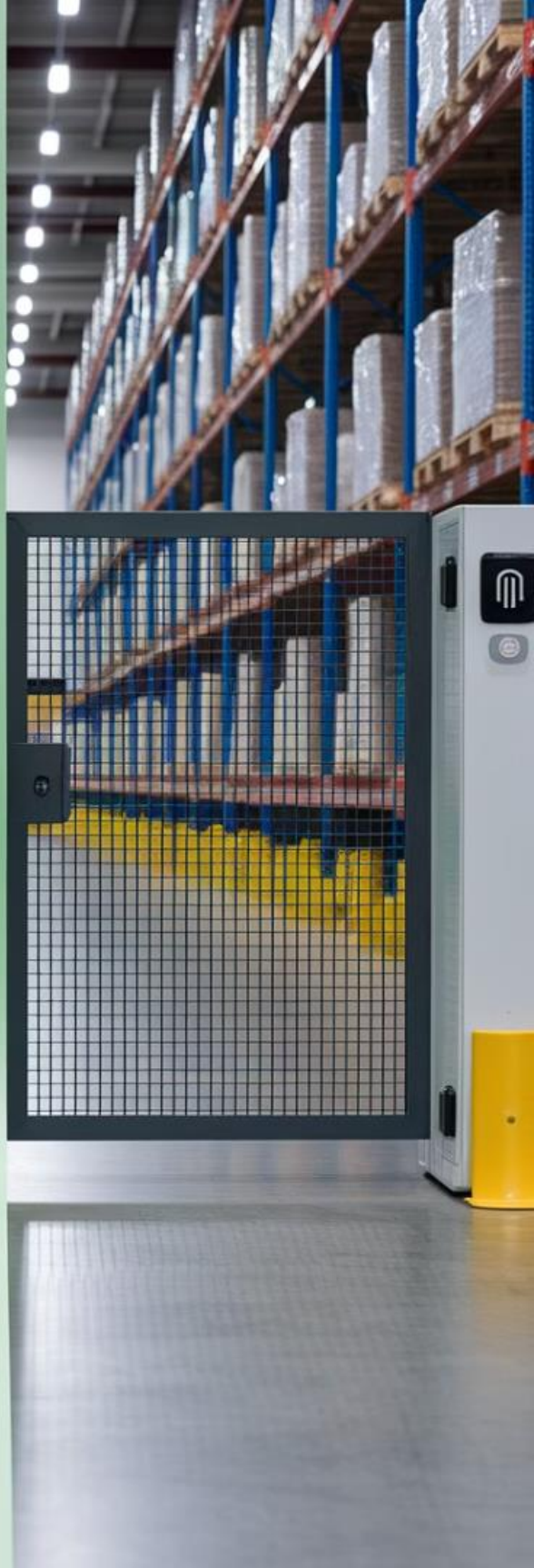
Automated verification ensures items are stored in optimal locations based on WMS logic, improving space utilization by 20-30%.

## *Picking*

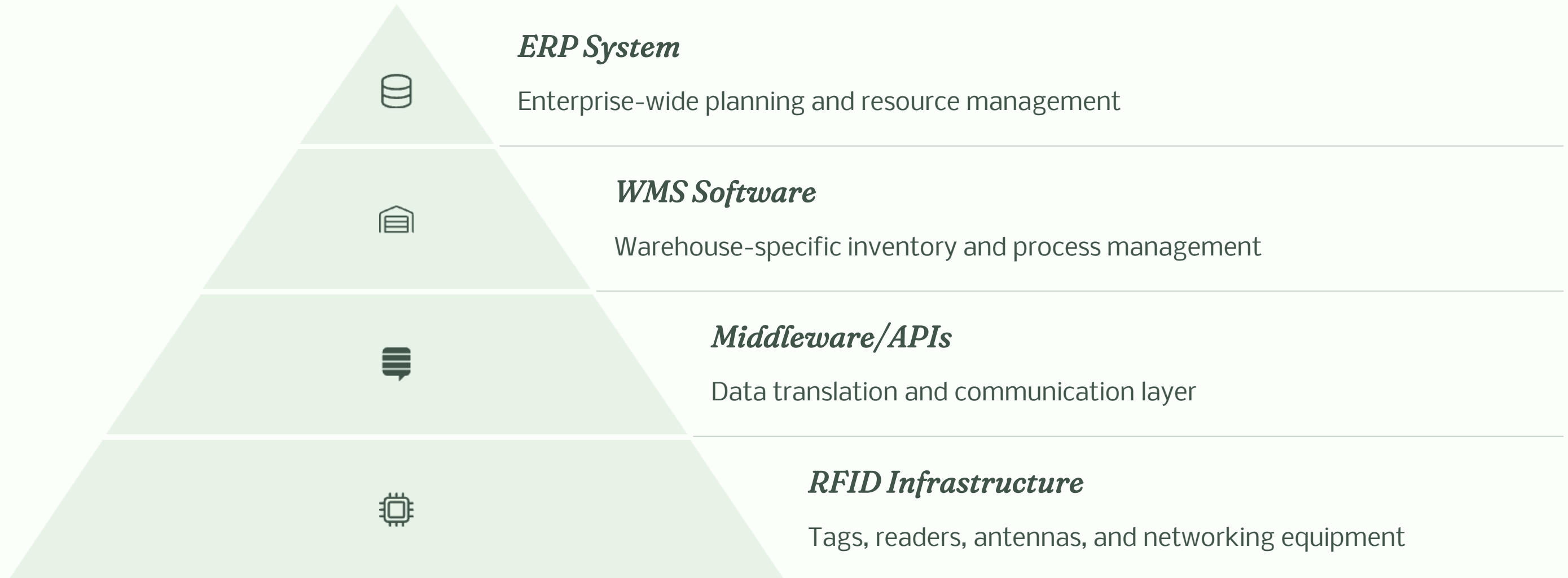
RFID-enabled picking carts verify correct items are picked, reducing errors by up to 80% and increasing picking speed by 40%.

## *Shipping*

Automated verification confirms order accuracy as items pass through RFID-enabled dock doors, reducing returns due to shipping errors by 65%.



# *Key Components for Successful Integration*



A successful RFID integration requires all components to work in harmony. The RFID infrastructure forms the foundation, collecting data that flows through middleware to your WMS and ultimately to your ERP system for enterprise-wide visibility and decision-making.

# *RFID Hardware Considerations*

## *RFID Tags*

- Passive UHF tags for standard inventory (30¢-50¢ each)
- Active tags for high-value assets (\$5-\$25 each)
- Consider read range, mounting surface, and environmental factors
- Durability requirements based on handling conditions

## *RFID Readers*

- Fixed readers for dock doors and conveyors (\$1,000-\$2,500)
- Handheld readers for manual operations (\$1,500-\$3,000)
- Consider read accuracy, range, and network connectivity
- Ensure compatibility with existing network infrastructure

## *Optimal Placement*

- Strategic reader positioning for maximum coverage
- Avoid metal interference and signal obstruction
- Position antennas to capture tag movement optimally
- Consider facility layout and traffic flow



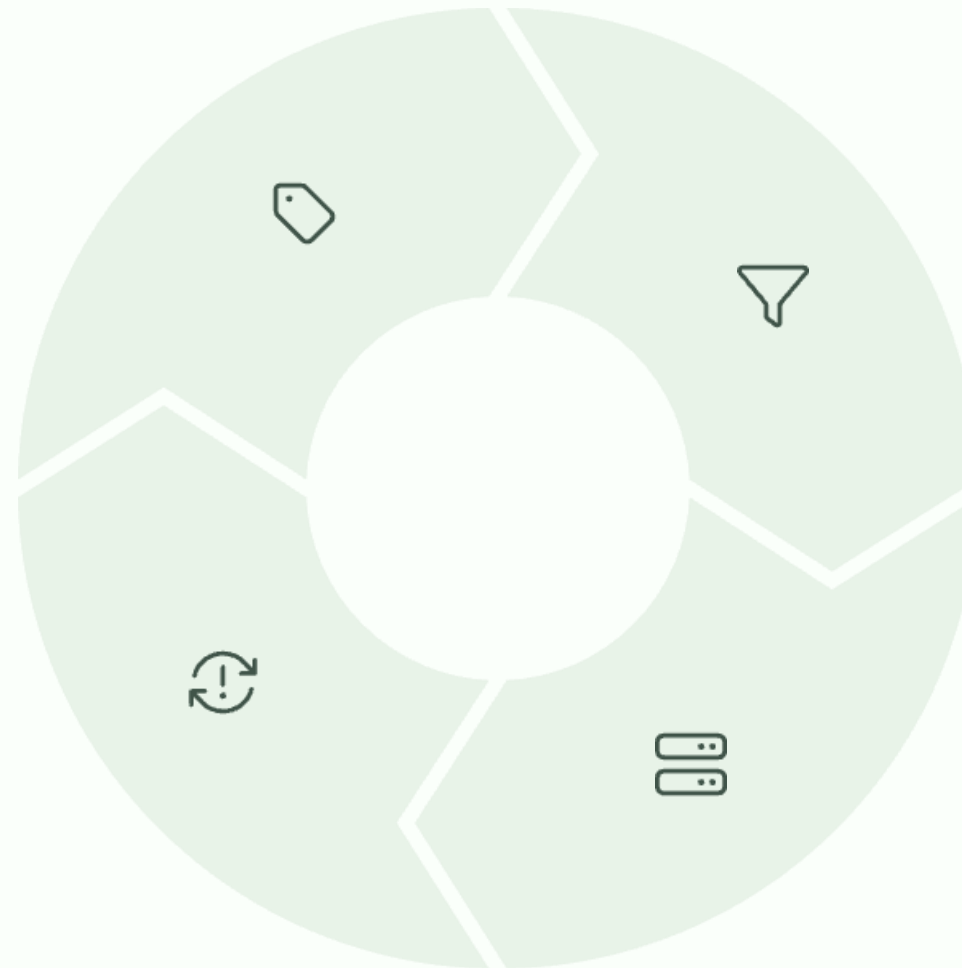
# *Software Integration Architecture*

## *RFID Data Capture*

Readers collect tag data and transmit to middleware

## *ERP Synchronization*

WMS communicates changes to ERP for broader business intelligence



## *Data Filtering & Processing*

Middleware filters duplicate reads and formats data

## *WMS Integration*

Processed data updates inventory and location information

The middleware layer is critical for successful integration, serving as the translator between RFID hardware and your management systems. It filters raw RFID data, eliminates duplicate reads, and formats the information into a structure that your WMS and ERP systems can process efficiently.

# *Compatible WMS and ERP Solutions*

## *Leading WMS Solutions*

These warehouse management systems offer strong RFID integration capabilities:

- Manhattan Associates WMS
- Blue Yonder (formerly JDA)
- SAP Extended Warehouse Management
- HighJump
- Infor SCM

## *Compatible ERP Platforms*

These enterprise resource planning solutions work well with RFID data:

- SAP S/4HANA
- Oracle NetSuite
- Microsoft Dynamics 365
- Infor CloudSuite
- Epicor

## *Integration Approaches*

Methods for connecting RFID with these systems:

- Native RFID modules
- API-based integration
- Third-party middleware
- Custom development

# Implementation Challenges

Do

## *System Compatibility*

Legacy WMS and ERP systems may lack native RFID support

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## *Data Management*

RFID generates massive data volumes requiring efficient processing

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## *Implementation Costs*

Hardware, software, and integration services can be expensive

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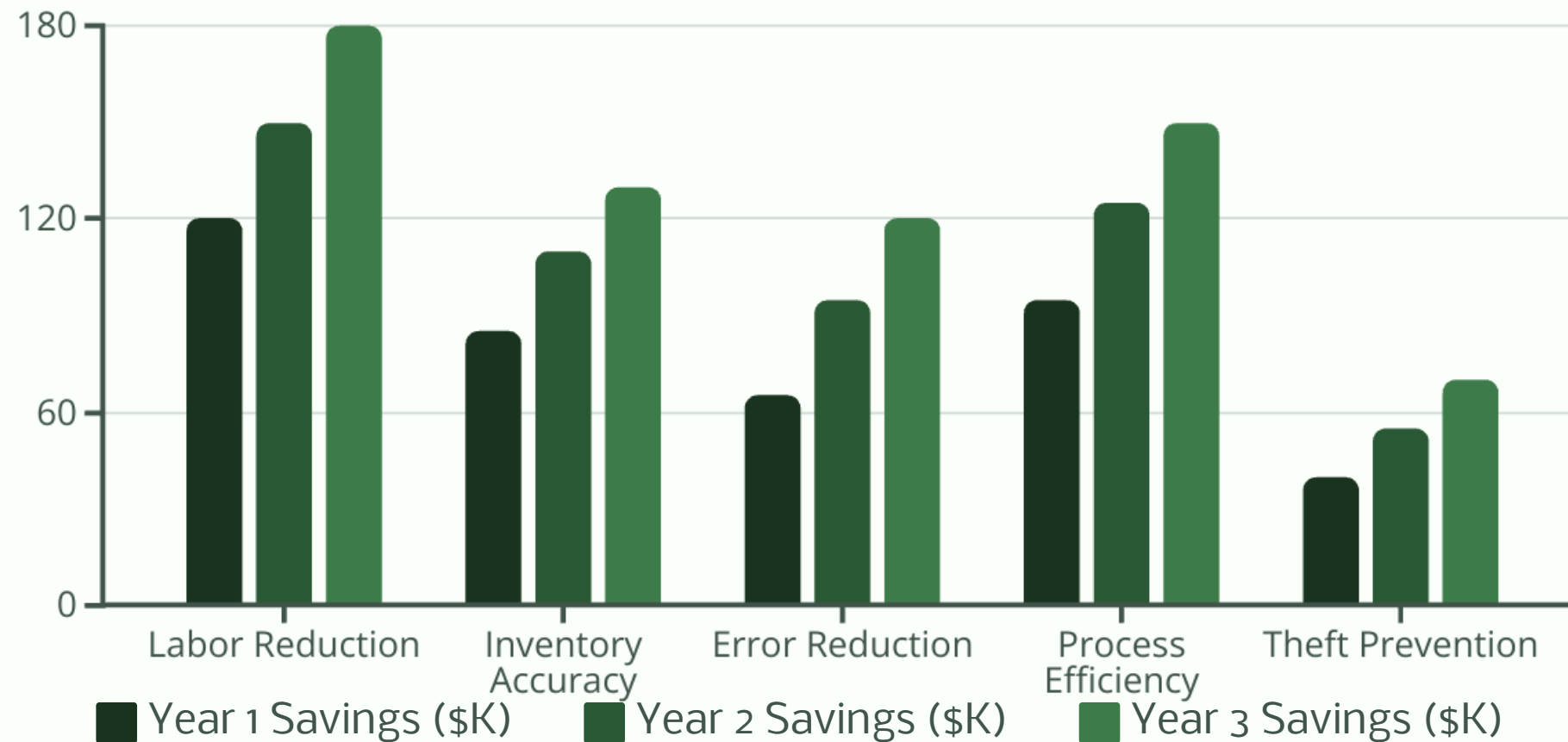
## *Security Concerns*

RFID systems need protection from cyber threats

While RFID integration offers substantial benefits, organizations must overcome these challenges during implementation. Many legacy systems require custom interfaces or middleware solutions to properly communicate with RFID infrastructure. Additionally, the volume of data generated can overwhelm unprepared systems, requiring effective filtering and management strategies.



# *ROI Assessment: Making the Business Case*



A typical RFID integration with WMS and ERP systems shows positive ROI within 12-18 months. Initial investments range from \$150,000 to \$500,000 for a mid-sized warehouse, depending on complexity and existing infrastructure. The chart shows projected savings across key benefit categories, demonstrating how the investment compounds over time.

# *Best Practices for Successful Implementation*

## *Conduct a System Audit*

Thoroughly assess existing WMS and ERP capabilities to identify integration requirements and potential gaps. Document current workflows and pain points that RFID could address.

## *Implement in Phases*

Start with a pilot program in one area of the warehouse to test integration and refine processes before full deployment. Use lessons learned to optimize the broader implementation.

## *Choose Scalable Solutions*

Select RFID hardware and software that can grow with your business needs. Plan for increasing tag volumes and additional read points as operations expand.

## *Ensure Data Quality*

Implement filtering techniques to eliminate duplicate or irrelevant RFID reads. Establish data validation protocols and regular system checks to maintain accuracy.



# *Training and Change Management*



## *Role-Based Training*

Develop customized training programs for different user groups, from warehouse floor staff to IT administrators and management. Focus on practical skills relevant to each role's interaction with the RFID-WMS-ERP system.



## *Process Documentation*

Create clear, visual documentation of new workflows incorporating RFID technology. Include troubleshooting guides and quick reference materials that staff can easily access during their work.



## *Internal Champions*

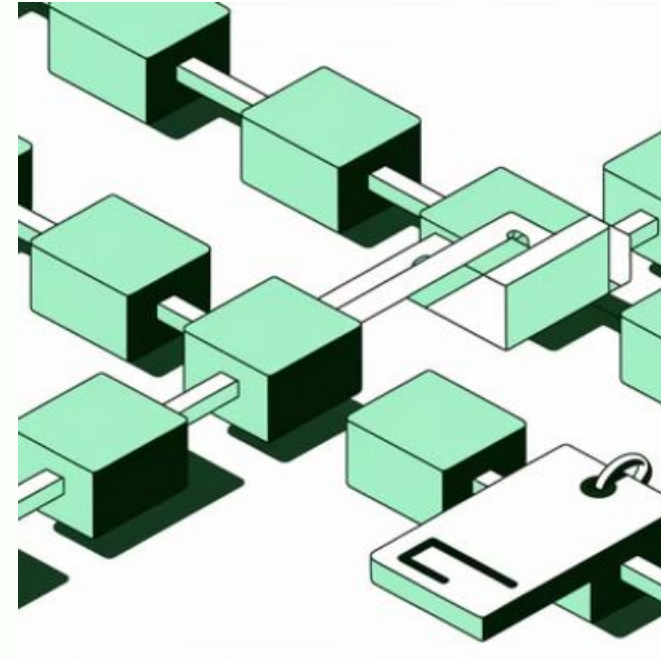
Identify and develop RFID champions within each department who can provide peer support and promote adoption. These champions become the first point of contact for questions and feedback.



## *Continuous Improvement*

Establish regular feedback sessions to collect user input on system performance and usability. Use this information to refine processes and address pain points promptly.

# *Future-Proofing Your RFID Integration*



The future of RFID integration extends beyond current capabilities. Emerging technologies like autonomous mobile robots with built-in RFID readers will further automate warehousing tasks. Augmented reality interfaces will leverage RFID data to guide workers with visual overlays showing inventory information.

Blockchain technology will enhance security and traceability of RFID data across supply chains, while artificial intelligence will analyze RFID-generated data patterns to predict inventory needs and optimize warehouse layouts. Building your integration with these future capabilities in mind ensures long-term relevance and value.