

Trends Reshaping the Future of Smart Warehousing

10 ways manufacturers can modernize warehouse operations

IMPROVE

Operational Visibility

EMPOWER

Your Employees

EXCEED

Customer Expectations



Improve Operational Visibility

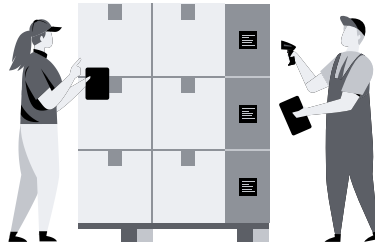
Operational visibility is foundational to every part of today’s manufacturing warehouse processes. Automated data collection can provide accurate, up-to-the-minute inventory—whether for finished goods, work-in-process or raw materials—to help reduce mistakes, avoid stock errors, and provide best-next-move guidance.



Getting ahead in today’s complex manufacturing landscape requires knowing product availability, location, and when you can deliver. Across the warehouse, it is vital to be able to communicate that information to your internal teams, external partners, and customers to manage expectations and ship as efficiently as possible.

3 WAYS

TO Attain and Execute on Operational Visibility with Automated Data Capture



Strategies for Success

Where To Start

1 Target All Parts of the Supply Chain

Invest in visibility from receiving, to fulfillment, to supply chain planning. From rapid advance ship notice (ASN) reconciliation to real-time inventory identification, you can better prepare to meet production plans—and manage any unexpected inventory issues that arise.

- Automated data capture with fixed industrial scanning or RFID portals
- Mobile computing connected to enterprise and warehouse systems
- Printing/encoding optimized for the task to label or tag prior to put-away

2 Track and Trace All That Matters

Sense and analyze critical assets’ real-time location, condition, and state—from inventory to people to material handling equipment and reusable assets—to allow for task and workflow synchronization for improved throughput volume, cost, and speed.

- Passive or active RFID tags and readers with the required location accuracy and update rate for tracked assets
- Sensors for monitoring physical environments
- Real-time location systems software, such as workflow optimization and asset management

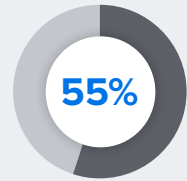
3 Act On Intelligence, Prioritize Continuous Improvement

Identify and address inefficiencies, avoiding costly errors or non-compliance events by recording the movement of items from work-in-progress to finished goods in the warehouse.

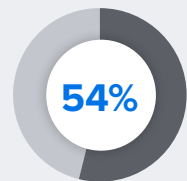
- Fixed or handheld RFID readers
- Bluetooth® low-energy technology
- Fixed industrial scanning
- Machine vision systems
- Temperature-sensing labels

Decision-Makers’ Improvement Plans¹

In the next two years

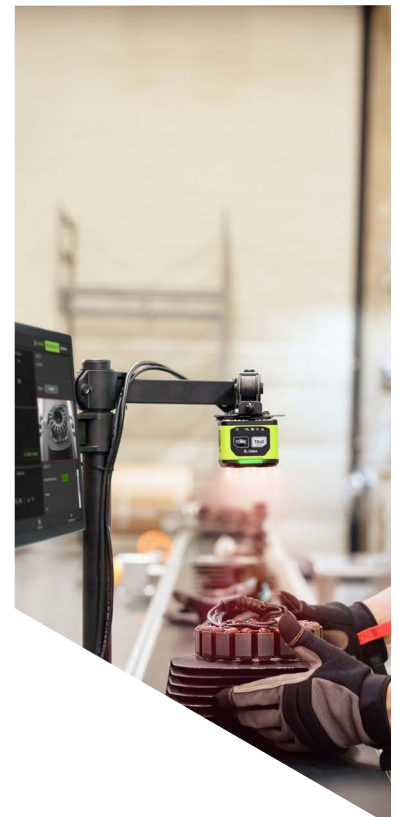


Invest in inventory and asset visibility within the warehouse



Invest in increased visibility across the supply chain

[READ THE STUDY >](#)



¹Zebra Technologies, “Warehousing Vision Study, Dynamic Markets Demand Warehouse Agility,” 2022.

Empower Your Employees

Augmenting employees with the right technology and automation can boost performance, increase output quality, and give your business a competitive advantage in attracting and retaining talent.



Technology is vital to creating an environment where workers feel more valued, contributing to increased job satisfaction and retention. Warehouse workers are embracing technology that saves time, improves precision, and allows them to reallocate their time to focus on more value-added efforts.

3 WAYS

To Engage and Support Your Employees



Strategies for Success

1 Shorten the On-Ramp to Success

Modernize outdated technology, update green-screen applications, and replace unreliable or mundane scanning. As a result, your operations will benefit from faster training, greater user adoption, less troubleshooting, and more focus on work.

- Android™ enterprise mobile computers for a familiar user experience
- Graphical user interface with touch-optimized screens
- All-in-one device for work and communication
- Fast, accurate scanning for multiple barcode formats and imperfect conditions
- Device software for management, consistent uptime, and productivity

2 Reduce Physical Requirements

Help your employees gain efficiency at work and still have energy when they leave. For example, minimize unnecessary walking and heavy lifting that diminish worker productivity and efficiency.

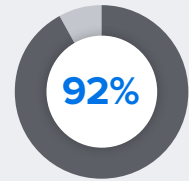
- Autonomous mobile robots (AMRs) for material movement of individual items, cartons, and pallets²
- Fixed industrial scanning or RFID to reduce high-volume individual scans
- Long-range scanning to minimize dismounts for lift truck operations
- Mobile push-to-talk and text for fast response time

3 Involve Warehouse Workers in Decisions

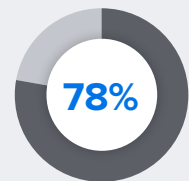
Implement ways for employees to pilot technology under consideration and provide suggestions for workflow efficiencies. Equip them with the tools they need to make next-best-move decisions and find maximum empowerment and satisfaction in their daily work.

- Professional services to assess workflow design and perform site surveys and solution validation
- Seamless implementation and deployment with staging, kitting, and program management
- Training and adoption services online, in-person and on-device

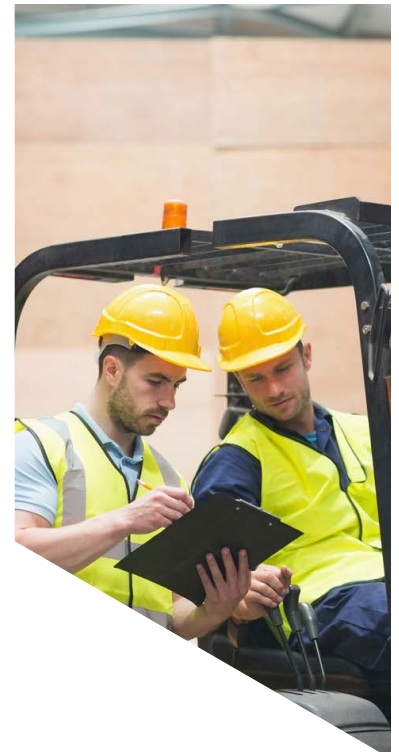
Warehouse Workers Appreciate the Advantages of Technology³



Agree that walking fewer miles would make their job more enjoyable, even if they had to pick more items



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²Product availability varies by region. ³Zebra Technologies, "Warehousing Vision Study, Dynamic Markets Demand Warehouse Agility," 2022.

Exceed Customer Expectations

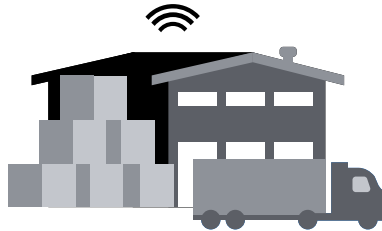
The manufacturing landscape has shifted, along with changing customer expectations. Today, many manufacturers are concentrating on distributing their products to business-to-business (B2B) customers and expanding fulfillment directly to consumers.



These realities heighten expectations for fast, error-free, transparent, and multi-channel experiences. Manufacturers are introducing a new set of logistics operations, including pallet and item level picking and shipping.

4 WAYS

To Meet Customer Demands with Speed and Accuracy



Strategies for Success

Where To Start

1 Stop Searching

Capture every real-time inventory move. Inefficiencies occur when you don't know when or where something is located, potentially delaying replenishment to production.

- Printers/encoders accessible throughout the facility to label and tag all inventory
- Fixed and handheld barcode scanning, RFID tag reading, mobile computing, and touchscreen/key entry integrated with your warehouse management system (WMS)

2 Optimize Mobility

Promote ergonomics, ease of data capture and retrieval, communication, and safety. Give workers what they need to comply with requirements.

- Wearable mobile computers and peripherals
- Vehicle-mounted computers for forklift operator safety
- Data capture matched to tasks
- Secure, unified communication platform
- Mobile device accessories for accessibility

3 Make Decision Making Easy

Provide electronic direction and confirmation to workers for every task or transaction. Let technology do some of the heavy lifting and provide guidance.

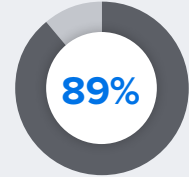
- Clearly labeled or tagged inventory at the item, carton, and pallet levels
- Handheld barcode scanners, mobile computers with scanning or RFID readers connected to the WMS
- AMRs with onboard displays

4 Focus On High-Value Tasks

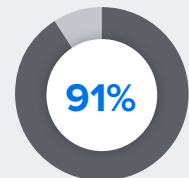
Direct workers to tasks that require human decision-making and skill and rely on automated decision-making and data capture for anything that can and should be automated.

- AMRs work alongside workers to guide tasks and reduce unnecessary walking⁴
- Optimization software for data-driven insights for next-best-move guidance sent to workers' mobile devices
- Fixed industrial scanning or machine vision systems for high-volume workflows

By 2027, Manufacturing Decision-Makers' Plan to Implement the Following Warehouse Solutions⁵



Reverse logistics solutions



Direct-to-consumer fulfillment

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⁴Product availability varies by region. ⁵Zebra Technologies, "Warehousing Vision Study, Dynamic Markets Demand Warehouse Agility," 2022.



A Path for Manufacturers to Modernize Warehouse Operations

New customer expectations and increasingly complex supply chains require manufacturing businesses of all sizes to rethink their modernization journey. The path to a modern-day, successful warehouse begins with the right solutions from a strategic partner like Zebra that can help you achieve efficiency, predictability, and adaptability to get where you need to be.

Your path forward starts with the following:

- 1** **DECADES OF FIELD-PROVEN INNOVATION**
in warehousing
- 2** **AN OUTCOME-DRIVEN APPROACH**
based on your strategic journey
- 3** **A FOCUS ON CONTINUOUS GROWTH**
and improvement of your business
- 4** **A COMPREHENSIVE PORTFOLIO**
to configure the right technology solution for your operations
- 5** **AN EXTENSIVE PARTNER NETWORK**
to support every aspect of your journey—as you control and set the pace

Together, we can help your manufacturing operations leverage enterprise-edge technology beyond the plant.

Start researching solutions for your modernization journey.

ValuTrack Corp
221 East Main Street, Suite 205, Milford, Massachusetts, 01757, United States
<http://valutrack.com>
8668258382