Zebra Warehouse Maturity Model
Your guide to moving modernization forward

To be competitive, having efficient distribution and fulfillment operations is critical to staying ahead. Let the Zebra Warehouse Maturity Model strategic framework guide your way forward. Gain the insight you need to optimize workflows with solutions built to help you achieve your goals.

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PHASES

A Smarter Way Forward for Fulfillment

You're Not Alone

We get it. Demand for higher levels of service is changing your business environment. Yet, with so much at stake, change isn't easy. We understand the complexities of modernizing warehouse operations. We're here to help guide your way forward to achieve your vision. With an ecosystem of strategic partners and the industry's broadest and deepest portfolio plus a strategic framework for modernizing — see your way forward at your pace.

What Is the Zebra Warehouse Maturity Model?

The Zebra Warehouse Maturity Model is a strategic framework that takes a phased approach to increasing operational visibility. It allows you to migrate, upgrade or innovate at your own pace without disrupting operations. Start with your top priorities to power your near-term and long-term vision.

Identify Opportunities to Move Forward

No matter which phase you're in, you'll find new ways to trim steps from workflows, increase productivity rates, manage your technology investments and use data and automation to make operations more profitable across your warehouse.

1 Identify and prioritize operational challenges you need to solve

2 Start with the core: worker and workflow optimization

3 Synchronize automation and your warehouse management systems with that core
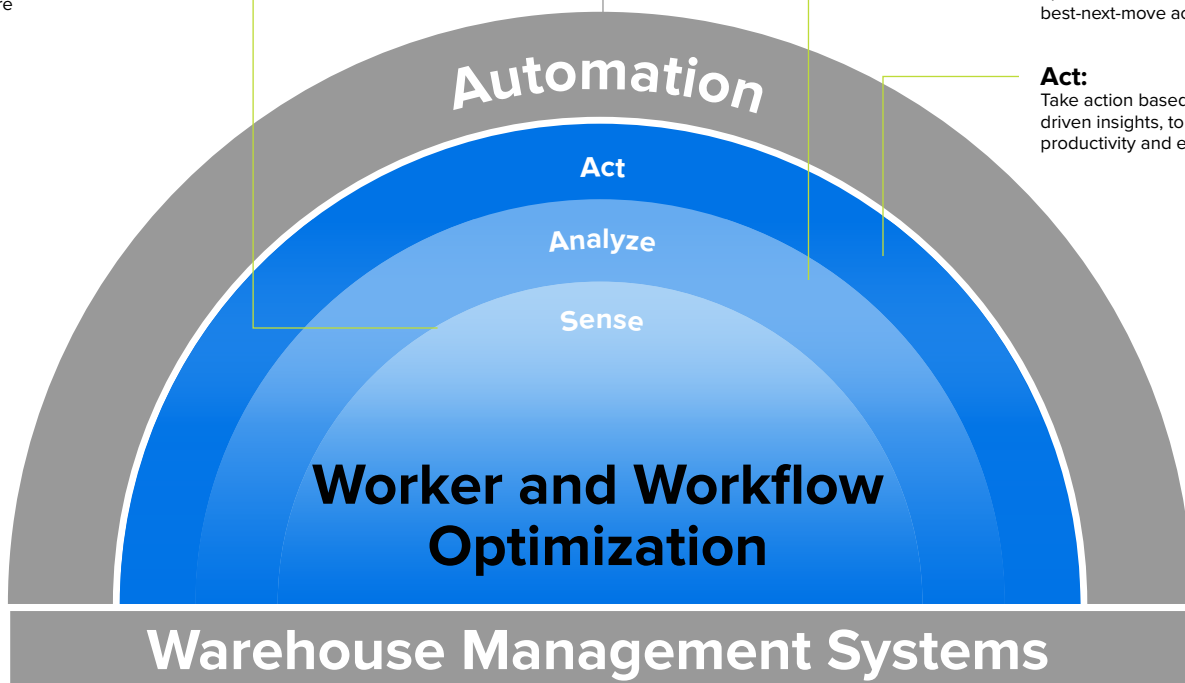
Sense: Give every physical asset and person a digital presence with each transactional or real-time data capture

Analyze: Create actionable insights by using captured and systems data to inform decisions, optimize workflows and provide best-next-move actions

Act: Take action based on data-driven insights, to increase productivity and efficiency

Automation

Act

Analyze

Sense

Worker and Workflow Optimization
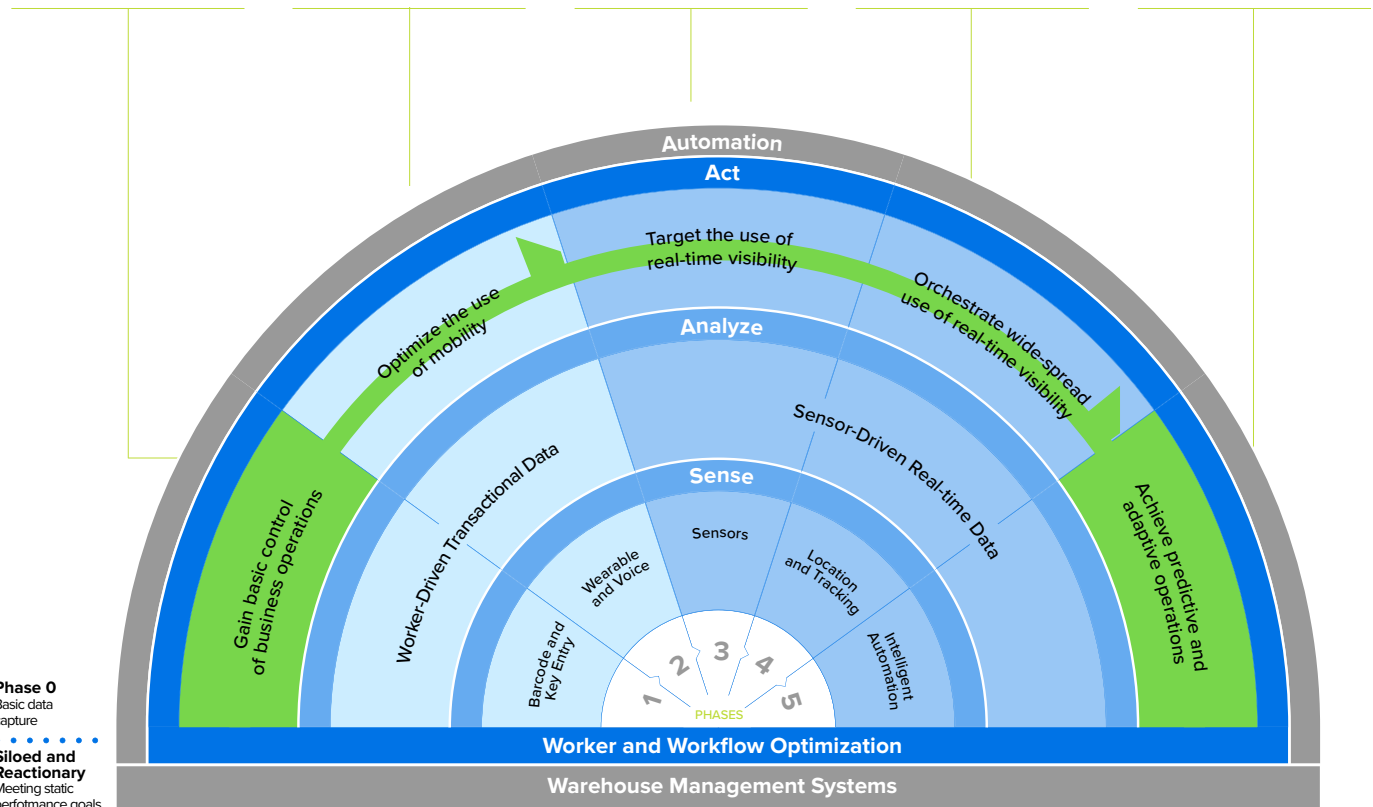
Warehouse Management Systems

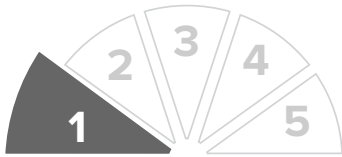# Plan Your Next Move with the Zebra Warehouse Maturity Model
Identify and prioritize operational challenges

How many do (or don't) we have?
Inventory inaccuracies result in operational inefficiencies

How do we handle more volume?
Higher order volume, more item-level picking and inventory moves increase daily transactions

How do we alleviate congestion points?
Worker-initiated, scan-based processes aren't fast or accurate enough

What's my best next move?
Unable to quantify decisions and optimize in the moment

How do we respond to quickly changing demands?
Being ten steps ahead is a necessity today

Phase 1
Improve Operations:
Greater Individual Worker Productivity

Phase 2
Connect Workers:
Greater Team Productivity and Workflow Conformity

Phase 3
Integrate:
Greater Asset Visibility and Utilization

Phase 4
Be Responsive:
Best-next-move Guidance and Decision Making

Phase 5
Predict and Adapt:
Proactive Performance Improvement

Automation
Act
Target the use of real-time visibility
Optimize the use of mobility
Orchestrate wide-spread use of real-time visibility
Analyze
Gain basic control of business operations
Worker-Driven Transactional Data
Sensor-Driven Real-time Data
Achieve predictive and adaptive operations
Sense
Sensors
Wearable and Voice
Location and Tracking
Barcode and Key Entry
Intelligent Automation
1 2 3 4 5
PHASES

Worker and Workflow Optimization

Warehouse Management Systems

Phase 0
Basic data capture

Siloed and Reactionary
Meeting static performance goals

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Gain Basic Control of Your Business Operations

Give all your physical inventory a digital presence in your warehouse management system and allow associates to capture every inventory move.

Operations at this Phase

- Small- to medium-sized businesses with less complexity (e.g., fewer SKUs, lower volume or few-to-no each picking)
- May not be currently capturing every inventory move
- Experience inefficiencies due to the lack of visibility into inventory location and status (e.g., low stock, overstock, misplaced inventory)

Phase 1 Goals

- Enable front-line workers to seamlessly transact with each inventory move to give all physical inventory a digital presence in your warehouse management system
- Reduce inefficiencies and remove barriers to inventory visibility
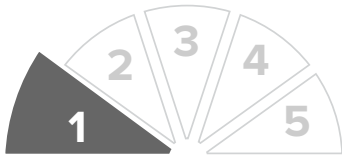
Benefits

- Increased worker productivity throughout all warehouse operations
- Eliminated lag time experienced by paper-based systems or limited connectivity for legacy devices
- Enabled associate access to warehouse management system data — whether sensing or acting on it
- Faster visibility into the state of inventory following a transaction

Recommendations for Success

- Think about your workflows and use cases first

- Identify your challenges or inefficiencies stemming from lack of inventory and asset visibility

- Determine outcomes you would like to achieve

- Examine your current data capture for efficiencies

- Streamline your operating systems for ease of use

- Put IT security first

- Enable IT to support operational demands

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Match Technology Solutions to Your Warehouse Challenges

Productivity Devices

Ensure greater individual worker productivity with these foundational technologies that give workers the tools they need to capture each inventory move and connect to warehouse management systems for increased visibility and productivity.

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Strategic Solutions

Your technology is business-critical to your operations. Look holistically at your solution to mitigate any risks to downtime, implementation errors and security, while ensuring productive use of your hardware.

Mobile Computing
Improve efficiency with modern Android™ mobile computing.

Zebra **DNA**™
Get a built-in advantage with software that covers every stage of your hardware's long life.

Rugged Tablets
Provide mobility for dense data-entry and look-up functions or lift-truck operation.

Zebra **OneCare**™ Maintenance Plans
Protect your investment against unexpected surprises that halt your operations.

Ultra-Rugged Scanning
Get first-time data capture of 1D and 2D barcodes.

Zebra **VisibilityIQ**™ OneCare™
Get cloud-based visibility into mobile computing and scanning device repairs, technical issues, contracts, case reports, software and security status.
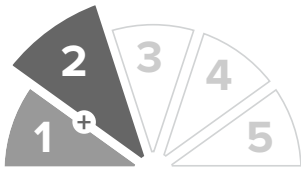
Industrial Printing
Set the foundation for your data capture with reliable, secure, high-volume barcode printing.

Zebra Signature Services
Utilize decades of experience to bring your vision to life.

Desktop Printing
Make it easy for associates to give assets a digital presence with more accessible print stations.

Zebra Intelligent Cabinets
Reduce loss while improving security, automation and workflows when you store and track Zebra devices.

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Optimize the Use of Mobility for Greater Team Productivity and Workflow Conformity

Increase the number of transactions performed each day for more visibility into the state of your inventory and workflows.

Operations at this Phase

- Have more complexity
- Experience higher order volume and inventory movement
- May have kitting, light assembly or sortation operations
- Outbound freight schedules may be more complex
- May include multiple facilities and/or shifts
- Likely manage higher employee headcount

Phase 2 Goals

- Increase associate performance and productivity at a transactional level
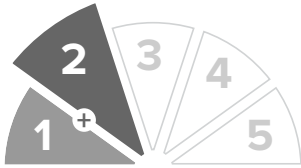- Manage workflows and prioritize tasks

Benefits

- Increased team productivity
- More consistency and accuracy in workflow execution
- Improved ergonomics to increase speed and worker comfort
- Unified team communications and mobilized managers
- Faster on-boarding of new employees to achieve full productivity
- Simplified remote information technology management

Recommendations for Success

Examine your workflows for opportunities to optimize by focusing on the following:

- Processes where data capture consistency and accuracy can be improved

- Tasks where lack of device comfort is hindering productivity or a safety risk

- Operations where team communications will improve productivity and efficiency

- Repetitive or time-consuming tasks that can be consolidated

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Match Technology Solutions to Your Warehouse Challenges

Productivity Devices

Consider form factors that allow you to capture and retrieve data consistently and accurately, mobilize managers and provide a safe, ergonomic solution for daily use.

Touch-Optimized Mobile Computing
Reduce the number of interactions to complete tasks with a graphical user interface.

Hands-Free Wearable Computing and Scanning
Complete tasks faster with hands-free technology that provides the stamina to capture more data.

Vehicle-Mount Computing
Keep equipment operators' heads up, on task and recording every inventory move.

Mobile Printing
Eliminate travel to fixed printing stations and extend productivity throughout your facility with printing at the point of application.

+ Strategic Solutions

Look beyond the hardware for opportunities to extend the capabilities of your devices with solutions that help front-line workers optimize the way they work for a complete best-in-class mobility solution.

Zebra **DNA**™
Enable faster, better and more accurate data capture and printing.

Zebra **FulfillmentEdge**™
Facilitate dynamic picking workflows by putting your existing WMS data to work for you.
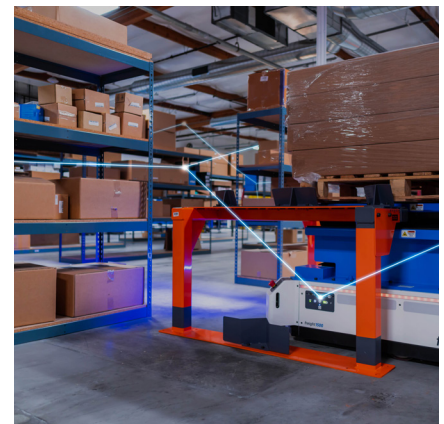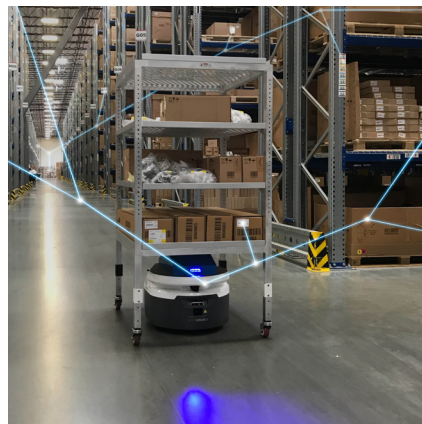
Zebra **WorkforceConnect**™
Reach colleagues now, not later on your business devices to communicate and collaborate through push-to-talk and secure messaging.
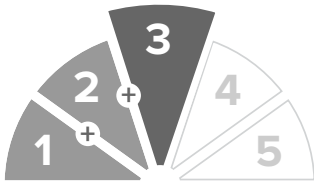
Zebra Signature Services
Uncover your critical business requirements, plan, deploy and achieve user adoption.

+ Automation Solutions

Further optimize workflows to ensure front-line workers are focused on high-value tasks. Automate existing manual cart operations and move individual items, cartons, totes and pallets in workflows such as picking, replenishment, kitting, put-away and repetitive material movement tasks.

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Integrate Greater Asset Visibility and Utilization into Your Operations

Eliminate areas of congestion, errors and inefficiencies that are a result of lack of inventory or asset visibility.

Operations at this phase

- Have optimized the use of mobility for front-line workers
- Realize human-initiated, scan-based processes may not be fast or accurate enough for current operations
- Need to address bottlenecks and delays at key operational points

Phase 3 Goals

- Target the use of real-time visibility to sense the physical environment directly
- Provide automated data capture to expand visibility into targeted areas that are currently lacking
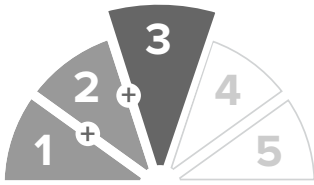
Benefits

- Automated data capture and material movement for faster processes
- Increased accuracy of data capture to support business needs
- Expanded asset visibility at key operational points
- Key data insights to improve physical process compliance

Recommendations for Success

- Identify processes where you lack visibility

- Target assets and functional areas where data capture and material movement can be automated

- Prioritize points where workflow compliance is critical

- Manage by exception to reduce delays and congestion

- Match sensing and location requirements to the problem

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Match Technology Solutions to Your Warehouse Challenges

Sensor Technologies   +   ## Strategic Solutions

Automate your worker-driven data capture processes where volume and complexity have increased. Achieve greater, more timely asset visibility and utilization in critical areas of your operation.

Get off to the right start by integrating targeted use of real-time visibility in your operation. Software and services increase the success of your implementation.

Fixed Industrial Scanning
Automate barcode scanning to track and trace inventory at peak operational points.

Machine Vision Systems
Verify contents, counts, inspect labels or pallets with state-of-the-art smart cameras.

Radio Frequency Identification
Target the use of passive RFID in portals or other areas that lack visibility to track inventory location and status, even without line-of-sight.

Bluetooth® Low Energy
Know when assets move and the general location or zone you can find them.

Electronic Temperature Sensors
Keep track of temperature exposure and know when limits have been exceeded.

Zebra **Aurora**™ **Software**
Set up, deploy and run Zebra's industrial machine vision and fixed scanner portfolio with one unified platform.

RFID Reader Software
Configure, optimize and deploy Zebra RFID readers with utilities, demo tools and software development kits (SDKs).
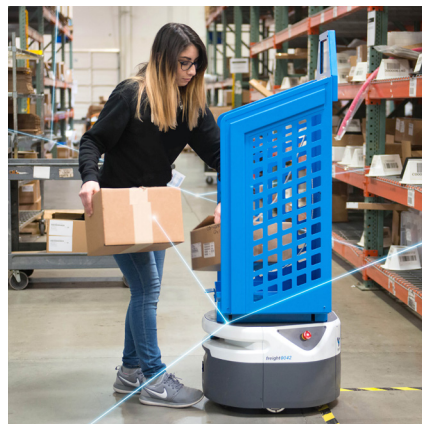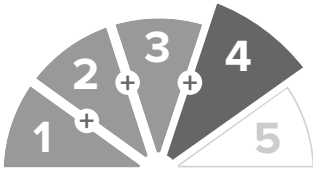
Zebra Signature Services
RFID Design
Get a full return on investment for any size RFID implementation. Improve the speed, cost and probability of success with thoughtful design, complete integration, deployment and go-live support.

+ ## Automation Solutions

Utilize autonomous mobile robots to speed up processes, reduce congestion and eliminate delays in your operation. Increase the integration with your warehouse management or terminal emulation systems to automate robot's tasks by coordinating with workflow progress in areas like picking, replenishment or put-away.

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Orchestrate Widespread Use of Real-Time Visibility

Achieve best-next-move guidance and decision making for your front-line workers with broad location-aware data capture and automated alerts in real time.

Operations at this phase

- Have optimized the use of mobility for associates and achieved a "best-in-class" mobility strategy
- Have more complex inventory and asset tracking challenges facility-wide
- Have increased asset visibility and utilization through targeted use of real-time visibility tools

Phase 4 Goals

- Orchestrate wide-spread use of real-time visibility
- Automate what can, and should, be automated
- Optimize the physical flow of goods from receiving through shipping using edge data generated by multiple real-time location sensors
- Pair constant visibility from real-time sensing with business rules to generate alerts and provide task optimization
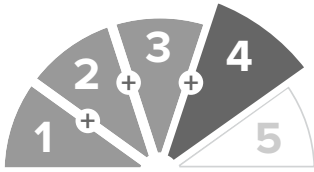
Benefits

- Full visibility and utilization of associates, robots and assets across the operation
- Automatically confirmed process accuracy
- Optimized and sequenced workflows that provide best-next-move actions
- Improved throughput volume, cost and speed

Recommendations for Success

- Determine what can, and should, be automated

- Establish warehouse workflows where you want to save costs, increase speed and gain efficiencies

- Integrate enterprise management systems to have transport, yard and warehouse systems communicate

- Give visibility to workers, inventory and equipment based on the challenge you are trying to solve

- Orchestrate all visible assets so they are connected and working together

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Match Technology Solutions to Your Warehouse Challenges

Real-Time Location Technologies +

Implement broad location-aware data capture throughout your facility taking into consideration each asset type and the range, accuracy, precision, update rate, battery life required to get the results you desire.

ATR7000 RTLS Reader*
Realize the benefits of active locationing with passive technology. Pinpoint the location of all your passive UHF RFID tagged inventory and equipment, even in motion.

Radio Frequency Identification
Reduce inefficiencies, have confidence in your inventory data and locate assets quickly with an end-to-end RAIN RFID solution that can solve a variety of track and trace challenges.

Ultra-Wideband Technology
Know where assets are with high precision and minimal delay of data refresh.

WhereNet Real-Time Location System
Get broader coverage in difficult radio-frequency environments and less precise accuracy beginning at 1 meter/~1 yard.

*May not be available in all regions. Contact your local Zebra sales representative or partner.

Strategic Solutions

Gathering the real-time location of inventory and assets is not enough on its own. Doing something meaningful with that information is where you will make a difference in your operation. From analyzing asset locations to device data, we can provide you with valuable insights to make your best next move.

Zebra **MotionWorks**™
Get operational visibility to automate workflows, eliminate unnecessary touchpoints and maximize resources.

Zebra **MotionWorks**™
Signature Services
Accelerate design and deployment of Zebra MotionWorks™ location solutions with confidence.
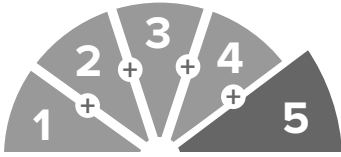
Zebra **VisibilityIQ**™ Foresight
Use predictive insights from multi-source data and machine learning algorithms for maximum device uptime and device allocation.

+ Automation Solutions

Synchronize real-time location of inventory, assets, front-line workers and autonomous mobile robots paired with optimized workflows to complete tasks efficiently and collaboratively.

Achieve Predictive and Adaptive Operations for Proactive Performance Improvement

Incorporate the use of more diverse data into automated decision making.

Operations at this Phase

- Have optimized the use of mobility for associates
- Primarily use real-time, location-based data with business applications to send alerts to associates
- Have access to useful data from a variety of sources
- Rely on associates to interpret data, which is neither holistic nor real time
- May have deployed robotics automation for some tasks

Phase 5 Goals

- Continue to implement real-time sensing throughout operations
- Continue to extend visibility to people, assets, robots and materials
- Integrate execution systems that optimize collaborative human/robot interactions in real time
- Build execution systems that leverage machine learning and artificial intelligence that can adapt to business needs
- Increase reliance on algorithms that fuse multiple sets of data together for more prescriptive guidance and automated decision making
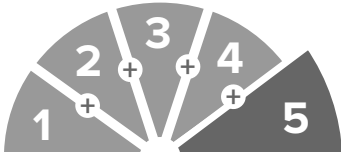
Benefits

- Maximized investment in automation
- Complex decisions made in real time to optimize and error-proof workflows
- Deeper visibility into all aspects of the operation
- Broadened supply chain traceability and visibility beyond four walls of warehouse
- Eliminated waste, errors and congestion
- Increased agility

Recommendations for Success

- Integrate physical operations with enterprise and planning systems

- Ensure automation strategy maximizing human capabilities to focus on high-value tasks

- Include real-time data from outside warehouse's four walls

- Use artificial intelligence and machine learning to optimize workflows, resource and labor planning and facility configuration

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Match Technology Solutions to Your Warehouse Challenges

Worker-Driven Transactional Data   +   **Sensor-Driven Real-Time Data**   +   **Automation Data**

Every barcode scan, key or touch screen entry and voice-directed application initiated by associates register as transactions in warehouse and enterprise systems and generate valuable inventory and device data.

Passive and active location systems, machine and computer vision systems, mobile sensors on material-handling equipment and robots, temperature and environmental sensors and fixed scanning provide a wealth of inventory, workflow and asset intelligence.

Cloud-enabled robot sensor data provides the flexibility to customize, manage and analyze operations from picking to material transport to inventory tracking.

Strategic Solutions

Explore solutions that will help you utilize data you're collecting more efficiently.

Zebra **Data Services**™

Transform edge data and events into actionable insights by building secure, scalable digital applications with cloud-based, unified APIs.

+

Zebra Signature Services

Workflow Design and Consulting
Discover new methods to transform your warehouse with consultative assessments and workshops.

Software Integration
Integrate your new solutions that collect data from your front-line operations into existing systems.

Learning as a Service
Set your teams up for success and accelerate user adoption of your new edge-data solution technology.

The Sure Path to Smarter Warehousing

From gaining basic control of operations to achieving predictability and adaptability, let us help guide your journey with a new standard for accelerating warehouse modernization.

Your way forward starts with:

- Decades of field-proven innovation in warehousing
- An outcome-driven approach based on your strategic journey
- A focus on continuous improvement of your business
- A comprehensive portfolio to configure the right technology solution for your operations
- An extensive partner network to support every aspect of your journey — as you control and set the pace

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