Warehouse Automation Trends

Four Warehouse Management Technologies to Transform Your Digital Supply Chain

RFgen

Table of Contents

Introduction

Digital transformation is changing the face of modern warehousing. Data runs like a river in the digital supply chain, and forward-leaning manufacturers and distributors will have to channel that data to meet rapidly changing buyer expectations.

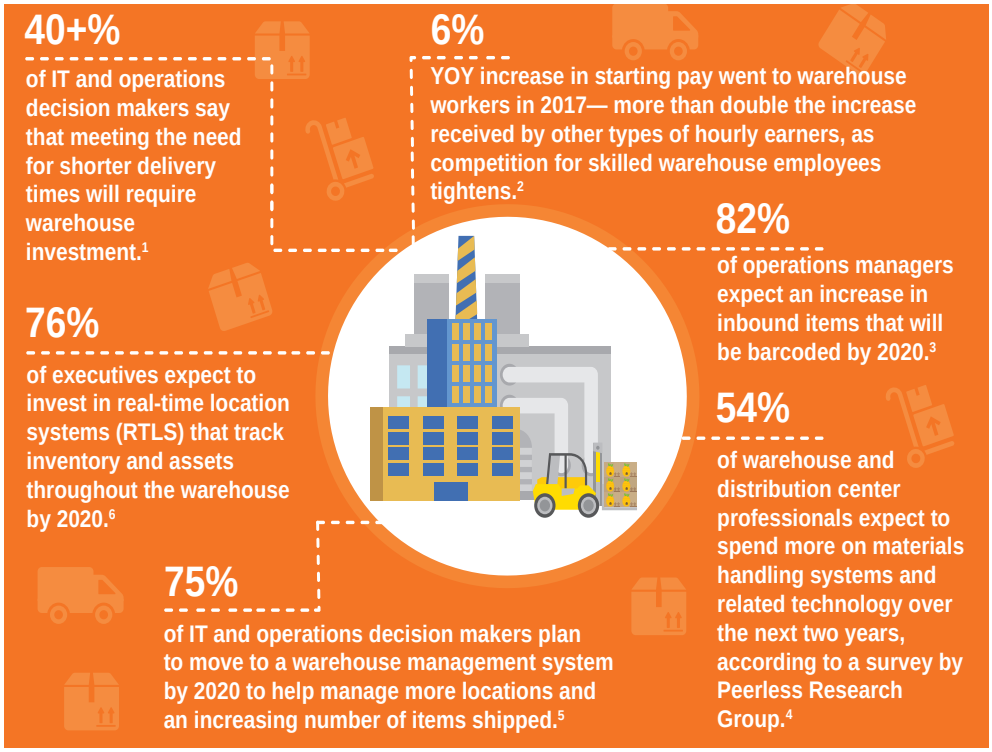
Today's customers, whether B2B buyers or retail consumers, expect to be able to locate products they need online, assess real-time inventory levels, and track their orders from the warehouse to their doorstep. Customers expect to receive their orders in a timely manner and not to find out later that a needed item was out of stock or that warehouse backlogs delayed the shipment.

Tomorrow's warehouse will need real-time digital supply chain data connected to the Industrial Internet of Things (IIoT), in order to serve customers, partners and suppliers.

All of this places tremendous demand on the IT and warehouse operations teams and the technology systems that support them. Obviously, no company can navigate the complex waters of digital transformation without first converting all of its supply chain information into digital data. Today's warehouse cannot afford to have paper in any of its workflows. Tomorrow's warehouse will need real-time digital supply chain data connected to the Industrial Internet of Things (IIoT), in order to serve customers, partners and suppliers.

In the pages that follow, we'll illustrate four ways to ready your warehouse for the future with efficient technology solutions. This guide will give you information about the benefits of each of these improvements, discuss evaluation criteria and provide real-world case studies of the solutions in action.

The State of Modern Warehouse Management



Symptoms of a Warehouse in Need of Optimization

There are many signs that warehouse inefficiency or inaccuracy is having a negative impact on your business. If your warehouse is suffering from one or more of these problems, it's time to think about new technology to automate slow processes and improve accuracy.

- Paper-based processes that require keying inventory transactions into the ERP system
- High rate of order errors and customer returns
- Costly shipment errors that result in missed customer expectations
- Inefficient utilization of warehouse employees
- Low morale among the warehouse workers and managers
- Overstocking or stocking out of inventory items
- Messy warehouse resulting in lost inventory and/or worker injuries
- Misplacing or losing inventory after it's been received
- Too many inventory counts

1 Zebra Technologies, key findings from the "Warehouse Vision Report 2020," press release April 26, 2016.
2 Edwin Lopez, "Warehouse boom boosts worker pay, employment," SupplyChainDive, April 10, 2017.
3 Zebra Technologies, "Warehouse Vision Report 2020.32"
4 Roberto Michel, "2017 Warehouse/DC Equipment Survey: Investment up as service pressures rise," *Modern Materials Handling*, April 4, 2017
5 Zebra Technologies, "Warehouse Vision Report 2020."
6 Zebra Technologies, "Warehouse Vision Report 2020."

Four Steps to Transforming Your Warehouse for the Digital Supply Chain

Step 1	Step 2	Step 3	Step 4
Get rid of paper-based processes by installing mobile data collection software and wireless barcode scanning devices.	Optimize the movement of goods in your warehouse and the routes taken by your workers with a Warehouse Management System.	Shorten learning curves and dramatically improve productivity by instituting voice-enabled picking in the warehouse.	Embrace Industry 4.0 by creating an IIoT strategy and incorporating new connected technologies into your supply chain, such as sensors, robotics, 3D printing, last-mile solutions, and augmented reality.

Step 1: Eliminate Paper-Based Processes with Barcoding

Nothing slows down your warehouse like paperwork. Whether it's walking around with paper pick tickets, or checking off items in receiving on paper purchase orders, the potential for human error is high. Paperwork can be misplaced. Handwriting can be hard to read. Assuming you have an ERP system, the information will all have to be reentered later, introducing more possibility for data entry error.

An automated data collection solution can utilize barcode labels or RFID tags in combination with mobile devices like smartphones and tablets to update real time metrics and validate data integrity. With barcoding, there's no more walking the warehouse with a clipboard and making notes on paper to type into the computer later. Now, everything will update in real time.

Speed and accuracy are two primary advantages of barcoding over paper note taking or even entering information on a keyboard. Barcode scanning is fast—five to seven times faster than keying data into a computer and much faster than writing by hand. While keying data generates one error for about every 300 keystrokes, barcode scanning has an average error rate of one in three million. That's an accuracy increase of 10,000% with barcodes![3]

Barcode scanning is fast—five to seven times faster than keying data into a computer and much faster than writing by hand.

3 Avery Dennison, "The Benefits of Bar Coding," product data sheet for Monarch printers.

Warehouse managers and IT personnel acknowledge the need to increase automated data collection usage in the warehouse. A recent survey of IT and operations decision makers found that 68% plan to make investments in barcode scanning and 68% plan to invest in tablets for the warehouse.[4]

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Motorola conducted a survey that revealed increasing automation in inbound and outbound handling is one of the top five opportunities to improve warehouse alignment. Their report states the need for increased efficiency requires "more ubiquitous barcoding" and supplier "support for more automated processes" and went on to predict that the number of barcoded items received at a warehouse or distribution center would reach 84% by 2018.[5]

Benefits of Automated Data Collection with Barcoding

Implementing barcodes in your warehouse and using an automated data collection system will:

- **Improve accuracy.** When you eliminate the confusion of handwritten communication and the typographical errors from manual data entry, accuracy skyrockets!
- **Increase productivity.** Scanning barcodes is much faster than making notes on paper. An automated data collection system will send the information collected from the barcodes straight to your ERP, so you also eliminate the time previously spent re-keying data.
- **Reduce labor costs.** Since each warehouse worker can accomplish more with automated data collection, your business can grow for a while without having to add people.
- **Help leverage your ERP system better.** Barcoding with automated data collection improves the quality and timeliness of the data in your ERP, so people throughout your organization are kept more up-to-date about the status of inventory and orders.
- **Help ensure compliance with government regulations.** Certain industries such as finance, aerospace and defense operate under strict government rules with costly penalties for compliance failures. Barcode scanning improves the timeliness and accuracy of data collection in your warehouse and provides a trail of who, what and where in your ERP.
- **Increase the tracking and traceability of products.** During a recall, the challenge is to quickly identify affected products and find where they are physically located. Automated data collection solutions keep track of lot numbers, batch numbers and serial numbers, so you can trace exactly where recalled products have been shipped.

4 Zebra Technologies, "Warehouse Vision Report 2020."
5 Motorola, "From Cost Center to Growth Center: Warehousing 2018," 2013, pg. 5.

What to Look for When Evaluating Mobile Data Collection Solutions

1. **Integration with your ERP or inventory control system.** One of the advantages of using barcoding is how much faster it allows you to update your back-end systems. Make sure the solution you choose offers certified or validated integration to your ERP, so you can be assured of proper interaction between the two systems. Certified integration extends the native capabilities in your ERP to your mobile data collection solution and doesn't require any intermediary tables.

2. **Open architecture.** If you choose a solution with open architecture and a zero footprint on the ERP server, you'll find it's easier to perform ERP upgrades without having to make changes to your data collection software. Do you need to be able to use the data collection devices offline from the ERP system? If so, you'll want a solution that offers WiFi (mobile and disconnected) modes. Finally, choose a solution with architecture that offers the flexibility to simplify, combine or reorder complex ERP screens. This will help employees work more intuitively and shorten the learning curve for your new solution.

3. **Implementation time and costs.** The sooner you can implement, the sooner you enjoy gains in the warehouse. Speed and cost of deployment have a big impact on your return on investment (ROI). A drawn-out or piece-meal approach to implementation can cost you in terms of warehouse disruptions and lower productivity.

4. **Affordability of hardware and software.** You've already invested a lot in your ERP and your data collection solution should leverage that investment. Make sure the solution you choose will offer a rapid return on investment (ROI) and supports affordable hardware including scanners and label printers.

5. **Labeling Requirements.** Over the last decade, new regulations placed on many industries—including pharmaceuticals, medical devices, food, and defense products—have led to rapidly changing label requirements. According to a Loftware survey, "more than 80% of respondents reported that labeling requirements have become more complex in the last three years."[6] It's important that any mobile data collection solution you choose can produce compliant barcode labels and integrates with a label printing solution.

6. **Flexibility of devices.** In a warehouse, the most common equipment for reading barcodes will be a wireless barcode scanner. But that may not always be the case. What if you want to add ruggedized tablets to forklifts or voice headsets for pickers? The solution you pick should be able to work with any type of mobile devices.

More than 80% of supply chain and IT professionals reported that product labeling requirements have become more complex in the last three years.

6 Josh Roffman, "Other Voices: 2017 Top 5 trends in enterprise labeling," Modern Materials Handling, March 2, 2017.

Barcoding Case Study

Company: Lakeside Manufacturing
U.S. Headquarters: Milwaukee, Wisconsin
Products: Mobile Equipment for Material Handling and Storage

Lakeside manufactures and supplies stainless steel, aluminum, and plastic mobile equipment providing unique benefits and solutions for the food service, clinical healthcare and material handling markets. The company's warehouse receives and tracks over 2,000 parts.

Challenge: Lakeside runs a lean manufacturing operation and needed to optimize receiving. They wanted the ability to scan all incoming parts and match them to the purchase order the parts were received under. By automating receiving, Lakeside hoped to eliminate manual data entry errors, implement a quality check program and ultimately reduce cost.

Solution: Lakeside implemented RFgen Mobile Foundations for Oracle's JD Edwards World with applications to automate Purchase Order Processing in Receiving and Inventory Control.

Results: RFgen has dramatically improved receiving processes in the warehouse. By barcode scanning all received parts, things go rapidly with no accidental typos or errors. With RFgen in place, Lakeside was able to:

- Reduce parts receiving and packaging time by five hours per day.
- Eliminate manual data entry errors.
- Enhance inventory control and reduce costs associated with rushed reorders.
- Improve the quality of products reaching the customer.
- Reduce new user training time from two months to about five minutes.

RFgen provides senior clerks the ability to receive the entire purchase order at once. RFgen prompts the receiving clerk with questions about incoming parts' quality and provides part diagrams to help determine if the part meets requirements. If not, a 'hold' label is printed, and the part goes into a physical holding location, rather than inventory. RFgen then emails engineering, purchasing and the inventory control group for verification, so a manager can inspect the part.

"RFgen dramatically improved productivity, timeliness and accuracy of our receiving and inventory systems... Now receiving flows from beginning to end. The RFgen solution reduced errors, streamlined processes, generated accurate inventory and improved our ability to ship product on time and under budget."

~ Eric Van Leeuwen
Sr. Manufacturing Engineer

Step 2: Implement a Warehouse Management System

After you've gotten the paper out of your warehouse, the next level of efficiency comes from implementing a Warehouse Management System (WMS). Aberdeen Group reports that labor in the warehouse can be as high as 40% of the total operating cost.[7] A WMS provides opportunities to increase the productivity of the warehouse without adding staff.

With so many increasing demands placed on warehouse operations teams, Peerless Research Group's 2017 "Annual Warehouse and Distribution Center Equipment Survey" found that interest in WMS has risen significantly. Their summary report notes:

> *"Spending plans on technology IS solutions, which include software such as warehouse management systems (WMS) and enterprise resource planning (ERP), saw a significant increase among companies who said they are proceeding with investments. While these companies are also spending slightly more on materials handling equipment (up 1%), their spending plans for IS systems jumped from 49% last year to 58% this year. That is easily the highest spending indicator for IS systems on this question over the last four years."*

A WMS helps you plan your warehouse for better utilization, locating higher-volume items in easier to reach places. A WMS can direct picking and put away operations to increase the efficiency of how your workers move through the warehouse. It can enforce warehouse rules for quality, such as first-in, first-out (FIFO) rules that keep items from expiring or becoming obsolete.

According to a 2017 survey by Peerless Research Group, 58% of companies planned to increase spending on WMS and ERP—the highest spending indicator in the last four years.

7 Aberdeen Group, "Completing the Journey to Voice and the Paperless Warehouse," July 2012.

Benefits of a WMS

A WMS shares many of the same benefits as an automated data collection solution, including even faster speed and better accuracy. However, a WMS delivers additional warehouse productivity in some strategic ways. The right WMS system will help you:

- **Enhance tracking and reporting on key warehouse metrics.** This can help you see how many times per year each item is moved or picked.
- **Optimize routes employees take through the warehouse.** Minimizing the crisscross of your warehouse will save time and increase the productivity of each worker.
- **Utilize space more effectively in the warehouse.** A WMS will optimize inbound receiving for new items, so that fast-moving items are put away in preferred locations, for example at the end of aisles or nearest the shipping dock. A WMS will also send items to special locations—for example sending frozen items to a freezer or intact pallets to box storage.
- **Lower cycle times.** Fill sales orders or work orders faster. A WMS can analyze a pick and split a large order between employees or send parts of orders to multiple locations if inventory on hand at one location is insufficient.
- **Increase the visibility of your inventory.** What are you using or selling the most? Are there some key items that your warehouse stocks out of too often? A WMS increases your visibility into inventory, so you can run leaner and increase your inventory turns.
- **Speed up picking and fulfillment.** Directed picking lets employees know exactly where they need to go. They don't have to search shelves or bins for the items they need.
- **Meet the special demands of customers.** A WMS can support special labeling needs such as license plating and facilitate EDI to match the trading requirements of customers.

Do You Need Full WMS or a "Light" WMS?

A traditional, full Warehouse Management System contains a tremendous amount of functionality. Frankly, a full WMS can be too much technology for the needs of many warehouse operations. The implementation times are usually long and the software is more complex and more expensive.

Aberdeen Group cautions that companies should evaluate WMS needs carefully to be certain the solution selected will provide adequate return on investment (ROI). Their analysts note:[8]

> *Failing to properly select and implement a WMS can have negative consequences – ranging from actual operational shutdown to less severe outcomes. Generally speaking, there are seven areas where a poorly fitting WMS can negatively impact a company:*
>
> 1. *Loss of functionality*
> 2. *Loss of flexibility*
> 3. *Constrained growth*
> 4. *Over-paying*
> 5. *Excessive upgrade costs*
> 6. *Delayed implementation*
> 7. *Failed implementation*

There is another option for businesses wanting a simpler WMS—often called "WMS Light" or "Lite."

There is another option for businesses wanting a simpler WMS—often called "WMS Light" or "Lite." A light WMS offers benefits such as lower cost, faster deployment and less complexity. Most light warehouse management systems have functionality designed to facilitate the most-commonly needed warehouse functions: Inventory control, order fulfillment including directed picking, and receiving including directed put away.

8 Aberdeen Group, "An Objective Guide to Selecting a WMS," December 2010.

Company: PowerStream
U.S. Headquarters: Ontario, Canada
Products: Public Utility

PowerStream is the second largest municipally owned electricity distribution company in Ontario, Canada, delivering power to more than 335,000 customers.

Challenge: PowerStream was seeking to gain efficiencies by maximizing the use of their JD Edwards system and simultaneously improving warehouse and inventory management procedures. PowerStream had difficulty maintaining accurate records during inventory transfers. Warehouse workers were using a paper-based process that created double work by picking on paper and then transferring the paperwork to the computer at the end of the day.

Solution: PowerStream implemented RFgen Mobile Foundations for Oracle's JD Edwards along with RFgen's Warehouse Director solution —a light, easy-to-use Warehouse Management System. PowerStream uses RFgen for Inventory Management, Purchase Order Processing and License Plating. Additionally, RFgen's Warehouse Director solution provides them with the directed item putaway capability they were looking for without having to purchase a full-blown, complex WMS.

Results: PowerStream's paper-based inventory system is now a thing of the past. All items in their warehouses are visible and easy to track.

RFgen helped PowerStream to:

- Eliminate inefficient, time-wasting paper procedures.
- Locate items more quickly.
- Maintain up-to-date accurate inventory counts.
- Keep track of current inventory, new items coming into the warehouse and items going out to jobs.

"By streamlining our inventory processes, RFgen's mobile data collection solutions have allowed our employees to do a better job. They now have time to take care of other responsibilities they weren't able to handle previously."

~ Brian Laws
Project Manager

Step 3: Voice-Enable Your Warehouse to Improve Picking Speed, Accuracy and Safety

If there's one area of warehouse operations to improve for the best cost reduction and increased productivity, it's picking. According to a survey by Aberdeen Group, picking activities encompass 50% of the direct labor in a warehouse and 35% of the operating budget.[9] Voice picking can take your warehouse efficiency to the next level—beyond the time savings and accuracy improvements you experienced with barcoding and WMS.

In voice picking, your warehouse workers are outfitted with a voice terminal worn on the belt and a headset. Your ERP or WMS delivers a pick order and the voice system begins directing the picker to each location on an optimized route. As the picker arrives at the bin or shelf, he or she says the location code. The voice system then directs the picker to the correct item and indicates the quantity to pick. The picker speaks back to the system to verify the pick. When it's time to move on, the voice system directs the picker to the next location. The entire time, a picker's hands and eyes are free; there is no computer screen to look at or scanning equipment to hold onto.

Nothing compares to voice picking in terms of improving order fulfillment efficiency.

As you can imagine, it's very easy to learn how to pick with voice commands. Nothing compares to voice picking in terms of improving order fulfillment efficiency. Aberdeen Group studied the effectiveness of voice picking in warehouse operations and concluded that voice users are:[10]

- 1.62 times as likely as non-voice users to have 99% or higher pick accuracy.
- 1.55 times as likely to have 99% or higher inventory accuracy.
- 1.59 times as likely to have on time and complete shipment rates of 99% or higher.

9 Bob Heaney, "Voice Technology Meets the eCommerce Distribution Challenge," Aberdeen Group, April 2011.
10 Aberdeen Group, "A Sound Decision: Utilizing Voice Technology for Improved Productivity and Quality," March 2010.

Benefits of Voice Picking

Voice picking is about speed, accuracy and natural movement. These aspects combine to deliver:

Tremendous accuracy. Voice picking results in only about 1 error in 10,000 actions.

Higher throughput. If you run a high volume warehouse, or your products are perishable, an increase in how fast you move products in and out of the warehouse makes a big difference to your bottom line. Voice operations increase productivity and throughput.

Fewer injuries. Workers are less likely to fall or trip with their eyes and hands free.

Faster training and learning. It's fairly common to find training time cut in half by voice. Some RFgen customers have experienced 75% reductions in the learning curve.

More timely shipments. Orders get picked faster with voice, leading to a higher percentage of on time shipments and happier customers.

As an example of the gains possible through voice picking, the RFgen-Vocollect Voice Solution is designed for picking in challenging environments and it can help businesses increase productivity by up to 35% and accuracy by up to 85%. Employees using voice picking are generally more satisfied with their jobs, resulting in an up to 50% decrease in labor turnover in the warehouse.[11]

New warehouse employees learn more quickly and employee turnover is lower in warehouses that use voice picking.

11 Vitech white paper, "Vocollect Voice: Optimized Workflow Performance," September 27, 2017.

What to Look for When Evaluating Voice Picking Systems

When you're ready to explore voice picking solutions, search for a system that is:

- **Ready for business.** The voice picking solution you choose should have an extensive built-in vocabulary for recognizing terms and phrases commonly used in warehouse operations.
- **Integrated with your ERP and WMS.** A voice solution for your warehouse needs to have been designed to be used with your ERP and WMS, so that it can update inventory and post transactions in those systems in real time.
- **Built for an industrial environment.** Make sure the equipment (headsets) you will use with your voice picking solution are adaptable enough to go anywhere your warehouse workers go, including cold storage.
- **Capable of eliminating warehouse noise.** Your voice system must be designed for use in a warehouse and know how to eliminate and ignore industrial noise such as forklift beeps, fan noises, background conversations, and machinery.
- **Adaptive to many voices.** Your warehouse workers have very different voices, with regional accents and ethnic dialects. The voice system must be able to understand them all.
- **Growing smarter all the time.** A good voice picking solution will become more accurate at recognizing the speech of your warehouse workers as they use it longer.

Voice-Enabled Warehouse Case Study

Company: Caito Foods
U.S. Headquarters: Indianapolis, Indiana
Products: Fresh Produce Distribution

Caito Foods operates four distribution centers that send fresh produce to multiple states.

Challenge: Caito used a paper-based system in their distribution warehouses and to track products to their customers. Going through the paperwork took too long in the event of a food recall and was not precise enough to pinpoint only the contaminated lots, so the company would have to destroy good food with bad. In terms of picking products for customer orders, Caito wanted to improve efficiency and throughput to get the fresh produce picked and out the door as soon as possible.

Solution: Caito implemented RFgen Mobile Foundations for Oracle's JD Edwards EnterpriseOne for Warehouse Management, Inventory Management, and Purchase Order Processing. Caito also implemented RFgen's License Plating Solution to help create accurate, traceable transactions throughout the warehouse and the RFgen-Vocollect Voice Solution for voice-directed picking.

Results: RFgen has dramatically improved the efficiency of Caito Food's warehouses. Using the RFgen-Vocollect Voice Solution has enabled Caito Foods to:

- Trace produce from suppliers throughout internal operations and on to grocery retailers.
- Improve the efficiency of receiving, put away and inventory replenishment processes.
- Fully automate inter-company branch transfers, saving time and reducing paperwork.
- Speed up picking and shipping with voice picking.
- Reduce the learning curve for new workers from three months to just three weeks.
- Improve warehouse analytics to better identify trends.

"One of the main reasons we decided to move to voice picking is that we create pallets as we pick; we don't stage. Our pickers need to have both hands free."

~ Cindy Garrett
Director of IT

Step 4: Develop Your Warehouse Strategy for Industry 4.0

Manufacturers, distributors and retailers will all need to undergo a digital transformation to gain a competitive advantage in the new economy of customer engagement. This puts pressure on the warehouse to deal with faster inventory cycles, and smaller, more frequent orders. The warehouse of the future will need to collect more real-time information that, in turn, can be accessed across the organization, by customers, and by supply chain partners.

Welcome to the Industrial Internet of Things (IIoT), also referred to as Industry 4.0 to reflect the fact that the Internet is creating a fourth industrial revolution. According to Network World, "Industry 4.0 connects the supply chain and the ERP system directly to the production line to form an integrated, automated and, potentially, autonomous manufacturing processes that make better use of capital, raw materials, and human resources."[12]

This is digital transformation for the manufacturing industry. The uninterrupted flow of supply chain data will break down traditional silos that stood between suppliers of raw materials, manufacturers, distributors, and ultimately, customers. And there is no time to lose in developing your company's Industry 4.0 strategy:

- 43% of manufacturers are already connected to the Industrial Internet of Things through real-time location tracking systems (RTLS), RFID or barcoding, according to the 2017 Manufacturing Vision Study.[13]
- By 2020, 62% of IT and warehouse operations decision makers expect to make investments in the Internet of Things.[14]
- According to PwC, business investments in Industry 4.0 will reach 5% of annual revenues, but a majority of companies expect to achieve ROI within two years.[15]

The warehouse will have an essential role to play in Industry 4.0. Warehouses that have already automated for efficiency with things like barcoding, warehouse management and voice picking will move on to "smart" technologies in which machine-to-machine (M2M) communication will be able to make warehouses run even faster and with lower labor costs.

43% of manufacturers are already connected to the Industrial Internet of Things through real-time location tracking systems (RTLS), RFID or barcoding, according to the 2017 Manufacturing Vision Study.[13]

12 Allen Bernard, "What is Industry 4.0?," NetworkWorld, June 5, 2017.
13 Claire Swedberg, "More than 60 Percent of Manufacturers to Use RTLS, RFID or Bar-Code Tracking By 2022, Says Zebra Technologies," RFID Journal, July 31, 2017
14 Zebra Technologies, "Warehouse Vision Report 2020," 2017.
15 PwC website, "Industry 4.0 will revolutionise industrial production," accessed October 3, 2017.

Here are some of the ways the IIoT may bring change to your connected warehouse:

- Robotics will move goods around the warehouse. When appropriate, specialized robots may bring shelves, bins or totes to human pickers in a stationary pick location.
- With sensor technology to perceive the exact location of fork lifts and other vehicles within the warehouse, it will be possible to route them—without drivers—to appropriate locations to putaway pallets.[4]
- Voice picking will evolve into vision picking using augmented reality headsets that overlay graphical images onto the workspace a picker is viewing, enabling the picker to receive additional digital information about items. According to Deloitte, “Some of these vision-picking systems offer real-time object recognition, barcode reading, indoor navigation, and integration of information with the warehouse management system (WMS).”[16]
- Manufacturers will pursue mass customization and hyper personalization of products to increase customer engagement and satisfaction. This may require distributed manufacturing and may involve new IIoT technologies such as 3D printers.[17]
- The supply chain will move even faster, as customers will expect more products to be delivered next day, same day or even within hours, prompting distribution centers to become more localized and pursue new technologies, such as drones, to move products over the ‘last-mile’.

Everything going on in the warehouse will be connected and traceable in the IIoT. As Ohio State University economist, Ned Hill, explained, "All of [a manufacturer's] equipment has to be integrated into their supply chain. So there is everything from purchasing to delivery to the way in which stuff gets stacked to go into the plant. All of that is going to be tied-in wirelessly. And traceability across the entire process to finished goods is also going to be part of this."[18]

If you are just beginning to automate your warehouse for transformation, you might not be ready for many Industry 4.0 initiatives just yet. But with each investment you make now, keep your eyes on the ways in which your company may ultimately want to plug into the IIoT in the future.

16 Alan Taliaferro et al, “Industry 4.0 and distribution centers,” Deloitte University Press, 2016
17 Derek Klobucher, “3 Big Trends to Help You Better Peronalize Your Products,” Forbes, August 15, 2017.
18 Allen Bernard, “What is Industry 4.0?,” NetworkWorld, June 5, 2017.

Tips for Implementing Changes in Your Warehouse

Whether you decide to implement barcoding, deploy a WMS, voice-enable key warehouse operations, or make your initial foray into the IIoT, here are some tips for making changes in your warehouse smooth and easy.

1. **Choose solutions that are easy to use.** More features do not necessarily make a better solution. If you choose a solution that is too big for your organization's needs, it may add too much complexity to your warehouse processes. At the end of the day, you want a solution that will be easy to learn and use, so it can be adopted quickly by the workers in your warehouse. A rapid learning curve will minimize the risk of disruption in your warehouse when you deploy the new technology.
2. **Create logical, time-saving workflows.** Choose an automated data collection solution that integrates with your ERP, but will enable you to customize the order of screens and questions. If you implement voice picking, make sure that solution can simulate the same workflow (usually directed by the data collection solution). By reordering screens, you can simplify the sequence steps for your warehouse workers, allowing them to complete tasks more naturally.
3. **Invest the time in training.** You're going to choose a system that is easy to learn and easy to use. But that doesn't mean you should skimp on your training plans. Members of your IT team should be trained formally by the solution vendor, including how to use the system and how to customize it if changes are needed. Train the warehouse workers after the system is implemented. It's especially helpful if IT can provide extra training to one "super user" in the warehouse and designate that person as a liaison between IT and the warehouse. On a day-to-day basis, the staff can take questions to the super user, who can kick them up the chain to IT only if necessary.
4. **Go all in.** Once you implement your new technology system, whether it's an automated data collection solution, a WMS, a voice system, or new IIoT connected technologies, go all in. Don't let small setbacks or hang ups send you back to your old system. Change is hard, and your warehouse employees won't want to use the new system at first. That's only because they are more accustomed to the old way. Don't let employees run both systems concurrently—for example, don't let them fall back on paper while they're learning to use the barcode scanners.

Conclusion

Think of the warehouse automation technologies presented in this guide as a journey toward true digital transformation in the warehouse:

Step 1
Eliminate paper inventory tracking and implement barcode scanning and mobile data collection throughout your warehouse operations—from receiving and putaway to inventory management and on through picking, packing and shipping out products. By scanning a barcode, warehouse employees can work much faster and manage a larger inventory of goods without an increase in labor costs. Mobility increases efficiency by eliminating the need for workers to be tethered to an ERP console in order to perform inventory transactions. This increases the efficiency, accuracy and throughput of your warehouse while collecting the real-time data your organization will need to meet buyer demands.

Step 2
Add a Warehouse Management System (WMS) or WMS-Lite System, which takes automation to a level beyond barcoding and mobile data collection. Now you can infuse your warehouse operations with business intelligence, helping you to optimize putaway according the most picked items, create faster picking paths through the warehouse, and more.

Step 3
Introduce voice enablement to the warehouse. By freeing your warehouse employees' hands, you enable them to work even more efficiently and with greater accuracy. Now your warehouse is moving at the speed of voice—and the improved efficiency will lower costs and speed up orders, delighting both customers and your warehouse workers.

Step 4
The final step makes the leap from a fully-automated warehouse to a digitally-connected warehouse by plugging your inventory and supply chain data into the Industrial Internet of Things (IIoT). This will enable your organization to provide an exceptional level of service to customers, while also collecting vast quantities of data that can be used by the company to improve operational efficiencies and even create new products and services for customers by finding ways to monetize information.

RFgen Software—The Data Collection Experts

RFgen Software helps organizations reduce supply chain implementation costs and increase accuracy and efficiency with the industry's most reliable and flexible mobile data collection and digital supply chain solutions.

Enabling you to mobilize critical warehouse and supply chain workflows, your mobile workforce has real-time and on-demand access to enterprise data. RFgen's mobile data collection solutions easily connect Windows, Android and iOS mobile devices like barcode scanners, tablets, handheld computers, RFID, wearable devices, and more to your back office ERP systems and databases, including Oracle's JD Edwards, Oracle E-Business Suite, SAP, SAP Business One, Deltek Costpoint, and more.

Offering on-premise, cloud, connected, and disconnected solutions; RFgen enables you to connect your ERP system to any mobile device, machine, or monitor. The RFgen Mobile Development Studio coupled with a suite of dozens of pre-built mobile applications gives you the ability to implement mobile data collection in a matter of weeks, not months.

Whether you are looking for solutions to automate your warehouse and better manage your inventory, comply with government regulations, ensure 24/7 warehouse operations, track and trace your products, voice-enable your warehouse, or manage your remote inventory, RFgen is the smart choice.

To learn more, please call us at 888-426-2286, or visit our website at: www.RFgen.com.

Reduce supply chain implementation costs with RFgen Software—one of the industry's most reliable and flexible mobile data collection solutions on the market today.

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