



ZEBRA

6 Steps TO FLAWLESS FULFILLMENT

Best practices for integrating mobile, wireless and data capture technologies into warehouse management



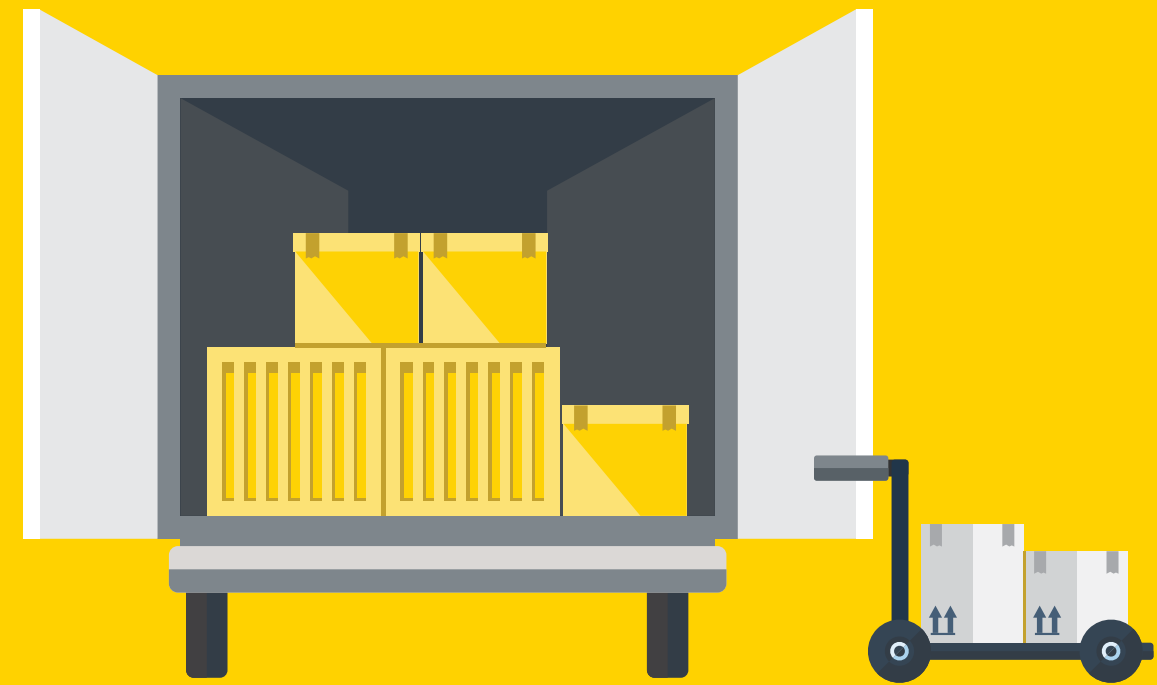


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OPENING THE DOOR TO FLAWLESS FULFILLMENT

The warehouse is the nucleus of your business. It is the hub through which nearly everything must pass, from raw materials and finished goods to a wealth of other products in a distribution center or retail warehouse.



THE IMPACT OF A FRAGMENTED WAREHOUSE

One of the greatest hindrances to flawless fulfillment in warehouse operations is technical fragmentation - the use of the right technology in only a few operations.

Resulting operational issues include inaccurate information, increased cost, reduced productivity, reduced customer satisfaction, lack of visibility and longer cash-to-cash cycles.

RESULTING OPERATIONAL ISSUES

-  Inaccurate Information
-  Increased Cost
-  Reduced Productivity
-  Reduced Customer Satisfaction
-  Lack of Visibility
-  Longer Cash-to-Cash Cycles

MOBILITY AS A CATALYST

To combat fragmentation and drive flawless fulfillment, today's forward-looking warehouse and logistics professionals are implementing wireless and mobile technology throughout their operations. In addition to new levels of efficiency, accuracy and visibility, mobility brings:



Massively reduced paper processes



Improved accuracy in item selection, packing and shipping



RFID tracking of materials and assets

WITH THE SHIFT TOWARDS SMARTER, MORE PRODUCTIVE MOBILE DEVICES, THE GOAL SHOULD BE TO ENSURE EMPLOYEES USE THE RIGHT DEVICES:



Fixed and mobile printers to support tracking of assets and inventory



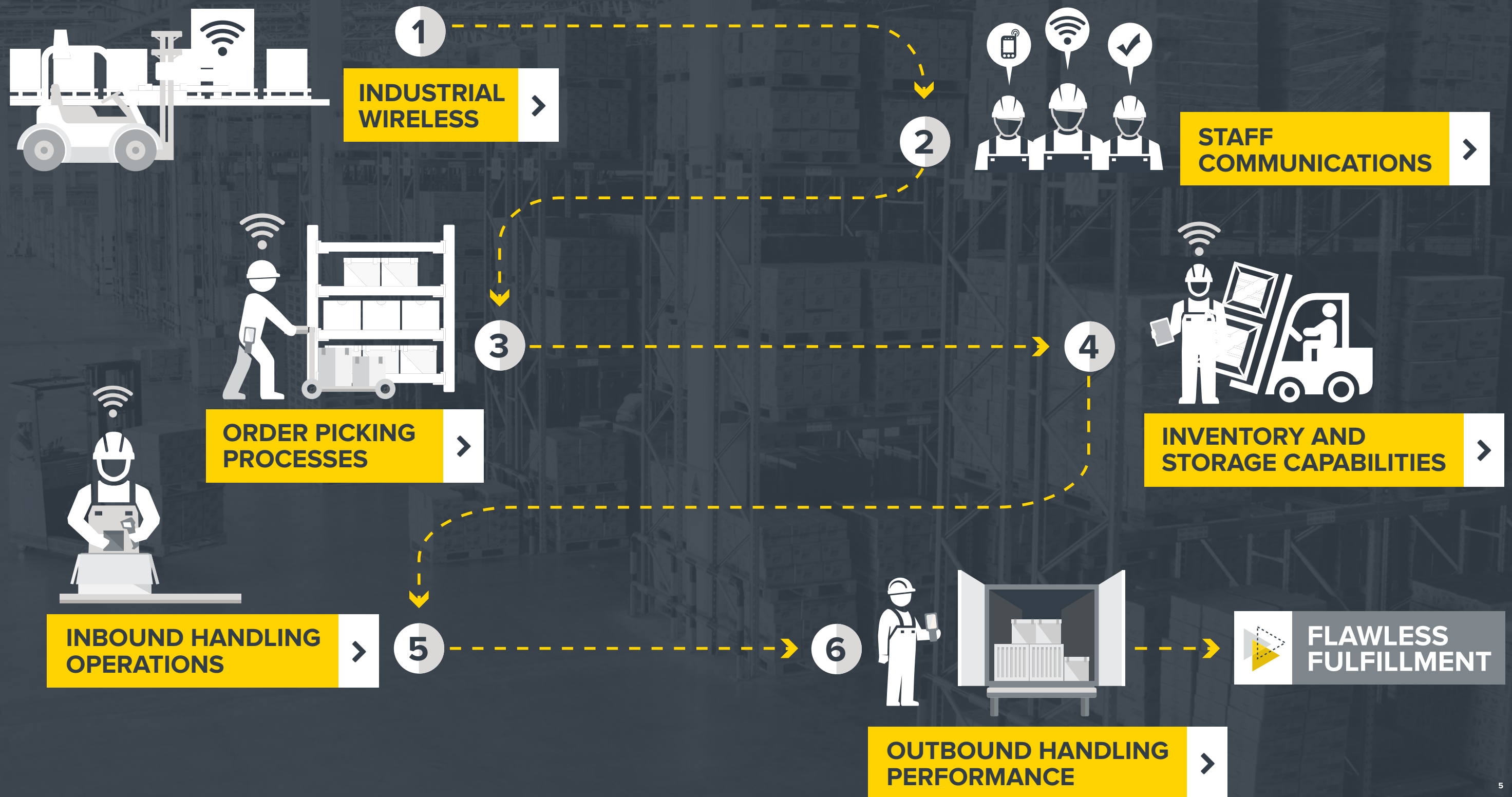
Hand-held, vehicle-mounted, wearable and hands-free devices for scanning, tagging, voice picking and more



Multi-modal technology to allow users to perform multiple tasks on one device

YOUR ROADMAP TO FLAWLESS FULFILLMENT IN 6 STEPS

The path to achieving flawless fulfillment begins by following the six critical steps that will help you create a more collaborative information architecture that not only enables a leaner, more flexible warehouse operation, but a leaner, more profitable enterprise as a whole. Equally important, your enhanced warehouse mobility can serve as the foundation for implementing more efficient enterprise-wide mobility.



Step 1: DEPLOY INDUSTRIAL WIRELESS SOLUTIONS

Flawless fulfillment starts with connectivity. Warehouse and distribution centers are classic examples of dynamic industrial environments that present much larger communications and technology challenges than those of the carpeted space. Today's warehouses are bigger, taller, and more densely packed than ever, putting a premium on fast order fulfillment. To fully leverage real-time communications technology that automates and streamlines processes, companies must first lay the foundation—an industrial-strength wireless and mobile network solution.



CHALLENGES TO WIRELESS AND MOBILE ADOPTION



Scale of Warehouse Floor

As warehouses increase in size, a lack of seamless communications with workers can cause costly inefficiency in virtually every function—from receiving to picking to shipping.



Unreliable Technology

Unreliable technology can lead to downtime that can wreak havoc on operations, customer satisfaction and ROI.



Outdated Hardware Creating Bottlenecks and Congestion

Older, outdated warehouse technology is often unable to deliver high bandwidth needed to overcome efficiency-sapping operational bottlenecks.



Device Proliferation

An inability to support today's wide variety of devices—laptops, handheld computers, tablets, barcode scanners, mobile printers, RFID readers and more—leads to unreliable communications and automated processes.

INDUSTRIAL WIRELESS SOLUTIONS

Benefits of Industrial Wireless Solutions

- ◆ Allows for automation and mechanization of labor-intensive processes such as receiving, put-away, storage, cycle counting, packing, loading and shipping
- ◆ Delivers real-time access to the WMS
- ◆ Provides a robust and reliable user interface on a wide range of devices to enhance worker productivity
- ◆ Provides persistent connections for roaming warehouse equipment (forklifts, crawlers, etc.), as well as scanners and handheld devices
- ◆ Assures efficiency with locationing technology to track workers, assets, and vehicles for optimal task management



ACCESS POINTS

Select your best option from our broad wireless access point portfolio to ensure enterprise-level security and high performance for any LAN environment.



SWITCHES

Obtain unified wireless-wired network management through a single pane of glass. Our wireless controllers and switches provide seamless roaming across deployments and resilient fail-over capabilities.



AIRDEFENSE SUITE

The advanced applications in this powerful suite work together to provide you device management, monitoring and analysis, and network security features to efficiently plan, design, deploy and protect your network.



NSIGHT

Simplify network monitoring, troubleshooting, and reporting with this powerful, feature-rich, management module that provides in-depth visibility: Zebra NSight™ platform.

Step 2: IMPROVE STAFF COMMUNICATIONS AND MANAGEMENT

Flawless fulfillment is impossible unless everyone in the warehouse can work together productively. This requires fast and efficient task management enabled by real-time voice and data communications between supervisors and employees everywhere in the facility. Managers can proactively direct work orders and assign tasks that are not currently driven by the WMS, as well as monitor the efficiency and progress of work as it is being performed.



CHALLENGES TO STAFF COMMUNICATIONS



Getting In Touch

Manager-to-employee-to-shipper communications through an inefficient pager system can be a barrier to efficiency.



Chained and Bound

Without the option of mobile connectivity, warehouse managers may be chained to their desktop computers, preventing them from spotting and resolving issues on the floor in real time.



Delayed Reactions

Too often workers cannot communicate effectively with each other, supervisors, or managers in real-time, making real-time issue resolution and higher productivity all but impossible.



Slower Operations

Without high-speed mobile voice and data access, procedures such as automation, cross-docking and task interleaving are unavailable.



Employee Turnover Rates

When warehouse managers are inaccessible to workers on the floor to support staff and resolve issues, job satisfaction drops and employee turnover rates increase.

MOBILE COMMUNICATIONS SOLUTIONS

Benefits of Mobile Voice and Data Communications

- ◆ Empowers managers to get out of the office and onto the floor, maximizing on-the-job efficiency and effectiveness
- ◆ Managers can access all business systems and workers with the push of a button
- ◆ Employees can communicate directly from their own devices, eliminating time lost walking to phone stations
- ◆ Eliminate distracting, nearly unintelligible overhead pages
- ◆ Provide for staff identification, access control, and locationing with physical cards



HANDHELD MOBILE COMPUTERS

Empower your workers by choosing the right mobile computer from a complete portfolio that provides all the features they need to improve productivity and efficiency.



TABLET MOBILE COMPUTERS

Get the best of both worlds! Combine consumer styling with all the advanced enterprise class features required to meet every business need.



WORKFORCE CONNECT: PTT PRO

Ensure your workers can always reach the right person, in real time via Instant PTT over Wi-Fi and cellular networks. Rich communication and data features in one single device!



CARD PRINTERS

Using the latest Zebra card-printing technology, these printers offer you unparalleled performance with high speeds and low maintenance—ready to meet your business needs now and in the future.

Step 3: STREAMLINE ORDER PICKING PROCESSES

With the advent of mobility in the warehouse, updating picking processes has become a major concern for many businesses. In Zebra Technologies' recent warehouse survey, more than half of respondents reported plans to increase the number of SKUs (59.5%), the volume of items carried (83.4%) and their annual inventory turnover (64.1%). In the next five years, almost 60% of respondents indicated plans to increase automated processes and 76% plan to equip staff with more technology. These initiatives are especially valuable for pick and fill functions where costs are high and errors can easily snowball into less accurate, less timely shipping and greater numbers of dissatisfied customers.



CHALLENGES TO ORDER PICKING PROCESSES



Walking the Walk

With legacy pick and fill processes, up to 70% of time can be spent walking to locate the right product, wasting time and reducing productivity.



One At A Time

The linear nature of manual order picking means processing must be done one at a time, resulting in costly, ineffective and inaccurate inventory visibility and higher carrying costs.



Unknown Errors

With manual processes and fragmented solutions, products cannot be automatically verified when picked, leading to unrecognized errors and inaccurate staging, packing and shipping.



More Volume, Smaller Orders

The rising volume of orders flowing through the warehouse, especially orders of smaller size and lesser value causes the relative labor expense for filling each order to rise, reducing already thin margins.



Costly Disappointments

Inefficient picking and filling operations cause inventory inaccuracies that all too often lead to costly out-of-stocks, lost orders, disappointed customers and lost revenues.

PICK AND FILL SOLUTIONS

Benefits of Mobility for Picking Operations

- ◆ Reduce business costs so workers can process more orders with fewer errors
- ◆ Know what products are on your warehouse shelves and the exact location
- ◆ Empower workers with hands-free and multi-modal technologies
- ◆ Re-label items with missing or damaged barcodes at the point of picking with a mobile printer

Benefits of Real-time Order and Inventory Data

- ◆ Conserve time with an automatic pick list along with the fastest route to each item
- ◆ Enhance existing pick schemes such as pick-to-tote, pick-to-light and carousels
- ◆ Receive instant verification that the right item has been picked
- ◆ Eliminate out-of-stocks by instantly deducting items from inventory as they are picked
- ◆ Receive granular picking information that enables LIFO/ FIFO for improved inventory management
- ◆ Instantly store serialized product information with customer orders to allow fast location of recalled products



TEKSPEECH™ PRO

Boost the effectiveness of your voice directed and multimodal picking, put-away, replenishment and other warehouse applications with the flexibility and high performance of TekSpeech Pro, our end-to-end voice-enabled solution.



WEARABLE MOBILE COMPUTERS

Maximize worker productivity, accuracy and task effectiveness in the most demanding environments with hands-free scanning unparalleled comfort and freedom of movement.



HANDHELD MOBILE COMPUTERS

Lightweight for convenience, rugged for efficiency, these devices come in different form factors with the flexibility to choose between Windows and Android Operating Systems.



VEHICLE-MOUNTED COMPUTERS

Give operators in material handling vehicles mobile access to the desktop applications they need to complete tasks faster and more accurately. These computers are built with a compact design and full PC functionality.



RUGGED SCANNERS

Built to withstand heavy use and harsh conditions, these high-performance scanners offer the scanning range, rugged design and speed that will make a difference in your business.



MOBILE PRINTERS

Select from our drop-resistant, lightweight, and user-friendly mobile printers—the best option to fulfill all your business printing needs with accuracy, speed and efficiency.

Step 4: ADVANCED INVENTORY AND STORAGE CAPABILITIES

Flawless fulfillment is impossible without properly stocked inventory. When cycle counts are conducted manually, or with older or fragmented technology solutions, they can be extremely time consuming and often fraught with errors. In the Zebra Technologies warehousing survey, respondents noted a dramatic drop in use of manual processes, with pen and paper usage going from 41% today to a predicted 12% in five years. Tellingly, cycle count motivation is evolving from concern about compliance to WMS optimization. In the survey, respondents reported that the top two cycle-count motivating factors are reduction of out-of-stock conditions and ensuring WMS accuracy.

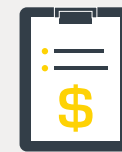


CHALLENGES OF MANUAL OR LOW-TECH CYCLE COUNTING



Error-Prone

Manual cycle counting is a major reason for a lack of accurate, real-time inventory, availability and control, making it costly, time-consuming and error-prone.



Out-of-Balance Sheets

A lack of real-time visibility into inventory and storage affects inventory valuation, adversely affecting your company's balance sheet.



Days Late, Dollars Short

Manual or low-tech cycle counts may take days or weeks, during which thousands of picks or putaways may occur, further creating inaccuracies.



Letter of the Law

To meet increasingly stringent regulations, companies must keep accurate inventory. No company wants the major disruption of a shutdown to do a complete physical inventory.

CYCLE COUNTING AND ASSET TRACKING SOLUTIONS

Benefits of Real-time Inventory Data Collection

- ◆ Dramatically improve efficiency and accuracy reducing count time from 3 or 4 weeks to less than half a day
- ◆ Ability to take cycle counts more regularly and routinely
- ◆ Better trend analysis improves buying practices
- ◆ More accurate data within the WMA results in fewer out-of-stock conditions
- ◆ Decreased capital expenditure for holding inventory
- ◆ Reduced inventory space requirements

Benefits of Automated Asset Tracking Using RFID

- ◆ Accurate and cost-effective tracking of assets with virtually no manpower required
- ◆ Keeping assets for an extended period of time reduces total cost of ownership (TCO) and improves ROI

VEHICLE-MOUNTED COMPUTERS

On-the-go operators can perform cost-effective tracking of assets with virtually no manpower required.



HANDHELD MOBILE COMPUTERS

Our rugged and reliable computers take efficiency and accuracy to the next level even in your most demanding environments.



INDUSTRIAL PRINTERS

Boost productivity in the most demanding conditions with our complete line of rugged, durable and highly reliable label and tag printers.



RFID PRINTERS

From on demand metal tagging, to high volume encoding and printing, our RFID printers offer greater tracking abilities, deeper visibility and faster output.



INDUSTRIAL SCANNERS

Built to withstand heavy use and harsh conditions, these high-performance scanners offer the scanning range, rugged design and speed that will make a difference in your business.



MATERIAL FLOW/LOCATION SERVICES

Get the real-time data you need to track and manage materials throughout your operation with just-in-time precision, while cutting costs and creating efficiency with Zebra's Visible Value Chain solution.



CHALLENGES TO COLD CHAIN STORAGE



Extreme Temperatures

Extreme cold temperatures in freezers and coolers can make it difficult for either employees or technology to put away, pick and count inventory with a high degree of accuracy, leading to costly out-of-stock, lost orders, lost customers and lost profitability.



Cold Hands, Bad Data

Workers sometimes have difficulty entering data accurately while wearing gloves or with freezing fingers.



Out In The Cold

Freezing temperatures and condensation caused by temperature fluctuations can result in unreliable operation in non-rugged mobile devices.



Historical Inaccuracies

Stringent safety regulations demand that companies keep accurate historical records. The lack of accurate, real-time data in the cold chain can result in an unreliable food temperature history.

COLD CHAIN SOLUTIONS

Benefits of Real-time Data in Cold Storage

- ◆ Improves traceability capabilities
- ◆ Enhances order accuracy
- ◆ Speeds shipping times
- ◆ Accurate monitoring and documentation of perishable food and pharmaceutical temperature history



VH10F VEHICLE-MOUNTED COMPUTER

Get maximum productivity and flawless fulfillment in your most challenging environments with the VH10 Series.



OMNII XT15 SERIES

The OMNII XT15, uniquely adaptive by design – is designed to work in -30°C temperatures.

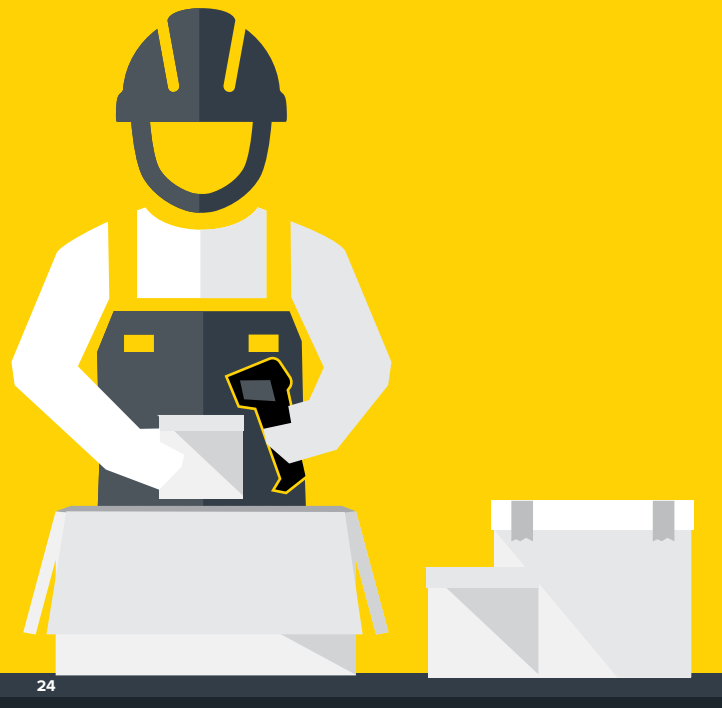


AP8163 ACCESS POINT

Harsh Environments Outdoor MESH Access Point: up to 450 Mbps, tri-radio 802.11n with 3x3: 3 stream MIMO. External N-type antenna ports.

Step 5: UPGRADE INBOUND HANDLING OPERATIONS

Receiving and sortation are critical steps in assuring flawless fulfillment. They're critical because issues in receiving all too often morph into other issues throughout the warehouse management process. To streamline inbound operations, today's warehouses must be able to manage two growing trends. First, their systems must be prepared to take advantage of increases in the number of incoming items that have barcodes. In a recent Zebra Technologies study, respondents predicted that the percentage of barcoded items will grow from about 65% today to almost 82% in five years. Second, they need to respond seamlessly to shifting supplier requirements, some of which the survey identified as the increased use of Advance Ship Notices (ASN), RFID systems, GSDN data and GS1 standards.



RECEIVING AND SORTING CHALLENGES



The Paper Chases

Pen-and-paper and other manual and fragmented technology processes result in lost time, reduced accuracy, decreased productivity and lower ROI.



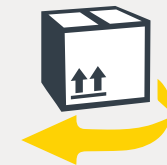
Poor Visibility

Slow and inaccurate receiving and put-away are barriers to real-time inventory visibility and control, as well as to effective cross-docking, task interleaving, traceability and tracking processes.



Slow Dock-to-Stock

Delays caused by pen and paper processes and isolated technological solutions reduce inventory control, lead to false out-of-stocks and lost sales.



Many Unhappy Returns

Increasing return rates and inefficient reverse logistics result in slow return of product to inventory, delayed customer credit processing and decreased customer satisfaction.



RECEIVING AND SORTATION SOLUTIONS

Benefits of Mobility at the Receiving Dock

- ◆ Overall increase in accuracy and productivity to process more shipments
- ◆ Identify incoming shipments in real time with a simple scan of a barcode, RFID tag or RMA label
- ◆ Quickly validate and update returns and automatically issue any customer credit
- ◆ Streamline handling of any errors in shipment
- ◆ Increased visibility allows intelligent put-away for items that are low in stock first
- ◆ More efficient cross-docking reduces handling time and costs for incoming shipments
- ◆ Items with missing or damaged barcodes can be re-labeled ensuring onward visibility



INDUSTRIAL HANDHELD SCANNERS

Reliable, affordable and versatile, these handheld scanners offer complete data capture functionality required to streamline and error-proof everyday processes. Choose the option that best suits your needs.



HANDHELD MOBILE COMPUTERS

Now your workers can identify incoming shipments with a simple scan, quickly validate returns, issue customer credits and more.



INDUSTRIAL PRINTERS

Loaded with advanced features and RFID capabilities, these durable printers excel in demanding environments.



MOBILE PRINTERS

Select the best model for your operations to print barcode labels, receipts and more – wherever and whenever needed.



RFID HANDHELD READERS

Rugged, reliable and ergonomic, these high-performance next generation readers offer the flexibility and efficiency your business needs.



RFID READER ANTENNAS

Whether you are looking for style and discretion for indoor use, global compatibility or impact and vibration resistance for harsh indoor and outdoor environments, you will find the right option for you.

CHALLENGES TO PUT-AWAY AND REPLENISHMENT



Inventory On Idle

Product sitting on a dock or misplaced in inventory is more than simply idle; it's also unavailable, which can mean lost sales and dissatisfied customers.



False Out-Of-Stocks

Put-away errors and delays can create inventory inaccuracies, which can result in erroneous OOS situations, unnecessary product replacement costs and lost sales.



Clogged Aisles

Slow, inaccurate manual processes and the limited throughput of older technology can cause congestion in your aisles, wasting time and decreasing productivity.



Equipment Misuse

Poor visibility and inefficient management of material handling equipment (MHE) like fork lifts and crawlers reduces MHE availability and productivity, and increases maintenance costs.

PUT-AWAY AND REPLENISHMENT SOLUTIONS

Benefits of Real-time WMS Access

- ◆ Scan a barcode or shelf tag to ensure items are placed correctly
- ◆ Ability to consult detailed records of shipment placement providing visibility to the exact location of all inventory
- ◆ Improve the company's profitability analysis and tax liabilities by implementing FIFO or LIFO inventory management
- ◆ Quickly respond to changes in inventory, production status and customer requests with automated lean replenishment techniques

VEHICLE-MOUNTED COMPUTERS

Optimize material flows with accurate barcode, RFID and location information at your fingertips.



INDUSTRIAL SCANNERS

Durable, reliable scanning capabilities help increase efficiency and accuracy to ensure flawless fulfillment every time.



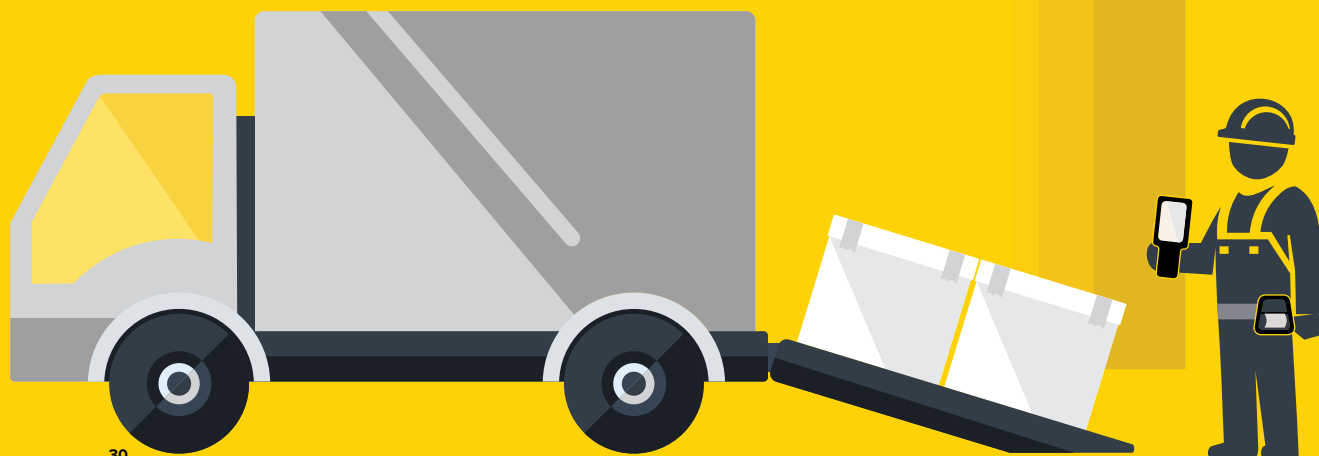
MATERIAL FLOW/ LOCATION SERVICES

Real-time visibility with multiple options to signal material moves help you optimize the process, and make intelligent inventory forecasting.



Step 6: TURNAROUND OUTBOUND PERFORMANCE

Packing, loading, staging and shipping are the 'last mile' in flawless fulfillment, so to speak. The importance of timely, accurate deliveries cannot be overstated. In today's hyper-competitive marketplace, these functionalities are key to turning around warehouse and distribution centers to streamline delivery, enhance competitive advantage and increase customer satisfaction and loyalty.



CHALLENGES TO PACKING, STAGING, LOADING AND SHIPPING



Sluggish Turnaround

In last-mile operations, when cross-checking to confirm that the right items are in the shipment must be done manually, turnaround times are slower and can cause significant shipping delays and lead to carrier detention charges.



Change Resistance

Manual processes often result in an inability to dynamically modify shipping orders to accommodate last minute changes and emergency orders from customers.



Impacting Packaging

In the packing functionality, the lack of real-time pre-packing information can easily result in orders that are incomplete, inaccurate and packed in the wrong size cartons or containers.



Inefficiency Ripples

Inefficiencies in processing while paperwork and data are manually entered into the system cause delays and errors in manifest creation and shipping that can easily ripple into customer dissatisfaction.

PACKING, LOADING AND SHIPPING SOLUTIONS

Benefits of Real-time Data for Outbound Operations

- ◆ Ensure greater accuracy in shipping with a final electronic cross check and on-the-spot printing of necessary paperwork
- ◆ Packers can receive notification that items on back order have arrived and complete the shipment prior to departure
- ◆ Packing material costs can be controlled, as your business system can determine the right size carton automatically
- ◆ Shipping and delivery times are improved, as trucks are fully loaded with the right contents
- ◆ Accurate order staging and loading improves driver productivity through reduced dwell time at each stop
- ◆ On time and accurate shipments maximize customer satisfaction and retention

YARD MANAGEMENT SYSTEM (YMS)

Better synchronize your yard operations, loading docks and gate check-in with actionable and optional real-time intelligence. This complete solution also includes visibility server software, RFID sensors and tags for optimized management.



INDUSTRIAL SCANNERS

These high-performance scanners, built for highly demanding environments, provide greater operation accuracy to increase driver productivity and minimize errors.



HANDHELD MOBILE COMPUTERS

These rugged mobile computers incorporate breakthrough ergonomic design and features, perfect for use in a warehouse, at the dock, in the yard, and out on the route.



VEHICLE-MOUNTED COMPUTERS

Use them anywhere you need to put desktop applications at the fingertips of your vehicle operators with super rugged design, full Windows support, and fast wireless connections.



RFID HANDHELD READERS

Get instant visibility into your operations. Easily add high-performance net generation RFID and 1D/2D barcode scanning to the mobile devices of today and tomorrow.



RFID READER ANTENNAS

Our antennas deliver the high-performance, capacity and range you need to track dense product traffic quickly and accurately, even in large application areas.



CONCLUSION

When it comes to warehouse communications and mobile data capture requirements, Zebra Technologies delivers. Our complete array of rugged industrial-strength mobile devices are designed for the rigors of everyday warehouse use, delivering visibility not just in the warehouse but across the entire supply chain.

As a global leader in the manufacturing of all things wireless and mobile for the warehouse, we offer an unparalleled depth of proven innovation for this market. Through countless deployments in some of the world's largest enterprises, including our own warehouse and manufacturing operations, we offer a wealth of understanding of the needs in the warehouse and beyond. Zebra Technologies is uniquely positioned to deliver a broad spectrum of professional and consulting services to further automate your warehouse operation and achieve an attractive ROI. In addition, our robust global partner channel brings the development and integration services you need right to your door, as well as leading applications and complementary products.



For more information on how Zebra can help you achieve flawless fulfillment, please visit us at: www.zebra.com/flawlessfulfillment



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