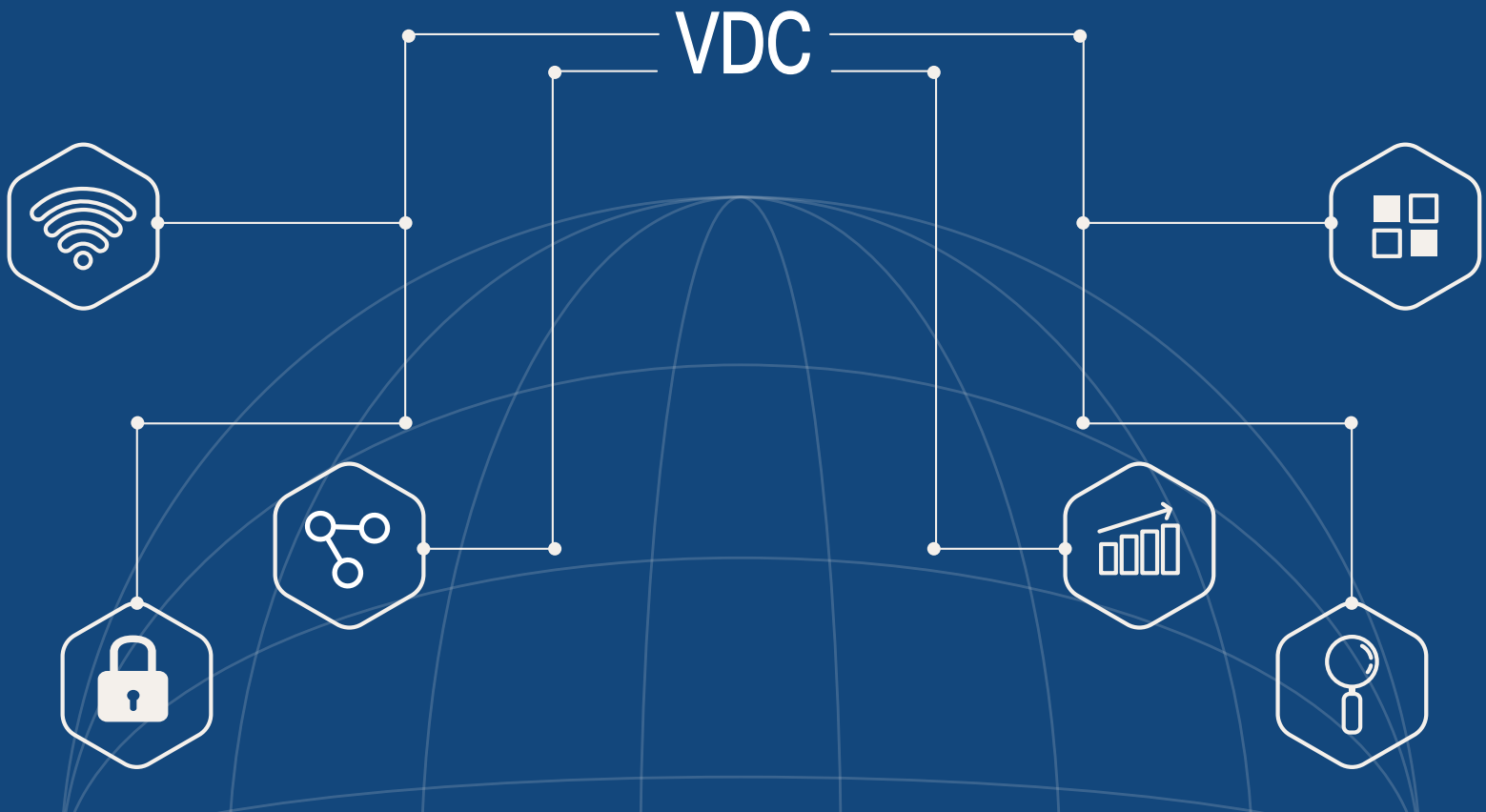


LOGISTICS OPERATIONAL PRESSURES DRIVING NEED FOR ADVANCED SCANNING SOLUTIONS



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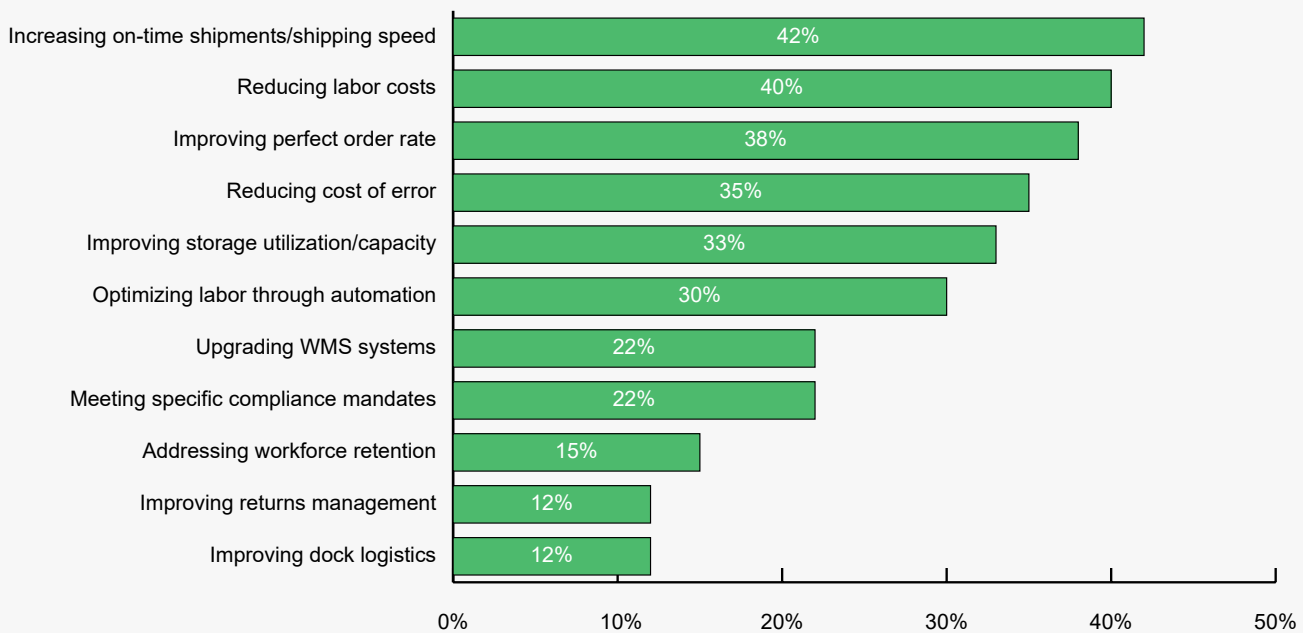
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INTRODUCTION

In today's world, warehousing operations face numerous challenges forcing leading decision makers to prioritize their investments precisely and intentionally. From ever-expanding shipment volumes and shipping speed demands, satisfying omnichannel fulfillment, and rapid shipping expectations to labor scarcity and high turnover rates, warehousing and logistics operations are under intense pressure. According to a study by VDC Research, key priorities for organizations looking to address their operational challenges include increasing on-time shipments/shipping speed, reducing labor costs, and improving perfect order rates. To address these growing pressures organizations are reevaluating their operational technology investments to better support their requirements.

In order to prioritize effectively, organizations must consider the unique challenges they face in addition to the increasing consumer demands and complexities of warehousing. For one, packages often have numerous barcodes to fulfill tracking, routing, identification, inventory management, product attribution, and customer requirements. A single pallet frequently contains copious amounts of multi-labeled packages that require specific and purposeful scanning. Holidays and other special times of year that spark increased order volume compound the pressure on organizations to process more parcels in a shorter time; pressure that drives workers to their limit.

Figure 1: Which of the following Warehouse initiatives does your organization plan to prioritize in 2024?



Source: 2023 Enterprise Mobility Buyer Behavior Survey; n=420)

While line-of-sight barcode scanning remains the fundamental catalyst supporting material management and logistics workflows, operators need more advanced and intelligent data capabilities to keep up with the new normal of warehouse operations. Ensuring the “correct” barcodes are being scanned and processed in the right order or that multiple barcodes are scanned as efficiently and seamlessly as possible represent key hurdles organizations are looking to overcome. Leveraging research conducted among warehouse and logistics technology investment decision makers, this paper addresses the operational pressures faced by logistics organizations and how advanced data capture innovations are addressing many of these challenges.



Increasing On-Time Shipments/Shipping Speed

- Warehouses are facing pressure to handle high order volumes and shipments with an increased level of efficiency due to the demand for quick shipping, especially during holiday seasons.
- E-commerce has elevated consumer demands for fast and reliable order fulfillment.
- Prioritizing on-time shipments/shipping speed will lead organizations to improved customer satisfaction and profitability.



Improving Perfect Order Rate

- Given the increased complexities and pressures of warehouse operations, organizations are increasingly turning to perfect order rate as the metric to measure performance.
- Companies must prioritize scanning speed and accuracy/error prevention to optimize perfect order rate.
- Companies with the highest perfect order rates carry less inventory, experience shorter cash-to-cash cycle times, and have significantly fewer stockouts than their competitors.
- Omnichannel retailing threatens perfect order rate by complicating workflows, requiring organizations to prioritize the structure and orderliness of their operations.



Reducing Labor Cost

- With their expertise, mobile workers act as the linchpin of the warehousing environment where labor remains central to operations and workflows.
- Labor inefficiencies are prevalent including high turnover rates, protracted onboarding, and a lack of organizations providing workers with optimum technology.
- Workers desire easy facile type solutions, fostering success through quick and effortless scanning.
- Lengthy training proves costly due to training expenses and reduced output.

ADVANCED SCANNING STREAMLINES DATA CAPTURE WORKFLOWS IN LOGISTICS ENVIRONMENTS

Line-of-sight barcode scanning remains the de facto data capture technology supporting logistics and warehousing workflows, as seen in a study by VDC Research. From receiving and put away to picking, cross-docking, shipping, and many more, barcode scanners persist as the most critical tool supporting operations. Increasing performance standards for scanners mandate functionality in harsh and low-light environments, long-range scanning, and the ability to read damaged codes. In addition to physical standards, scanners must be versatile and precise, capable of handling products labeled with multiple barcodes or two-dimensional barcodes.

To support these more sophisticated data capture realities with mounting volume and turnaround speed pressures, organizations are looking for more advanced data captures solutions that can support features such as Continuous or Multiscan in a highly ergonomic or unobtrusive form factor, reducing the strain on workers required to scan hundreds of barcodes per shift. These features optimize workflows while addressing the labor and operational challenges common to warehouses today.



MULTISCAN

Multiscan is focused on control and precision, advantageous for use cases like cross-docking, put away, storing, order fulfillment, and picking. Users can add filters, implement rules, develop sorting algorithms, and predefine the order of barcodes transmitted to the WMS/ERP while requiring no system adaptations. Through these rules, integrated software logic allows users to scan up to 5 barcodes simultaneously, sending them to a backend application in a predetermined order and without the concern of inadvertently scanning incorrect codes. The ability to register multiple barcodes in a single scan and precisely arrange them in the WMS addresses two paramount workflow challenges. Errors and delays can be greatly limited by the predetermined order and selection of barcodes, vital in timely and accurate order fulfillment. Furthermore, employees will be more satisfied as their process is organized, simplified, and requires up to

five times fewer individual scans. Combining multiple barcode scans into one improves the productivity and efficiency of e-commerce processes supported by simple plug-and-play integration without IT system adaptations. Multiscan is useful across the warehouse environment, optimizing workflows and improving organization across use cases.

Table 1: Multiscan Benefits by Use Case

Use case	Multiscan benefit
Cross-docking	Multi-scanning allows simultaneous scanning of multiple items as goods move from inbound to outbound vehicles. Users can preselect barcodes and predetermine their order, expediting this transition.
Put away	When placing items in storage locations, multi-scanning enables operators to preselect and predetermine barcode order, enhancing efficiency in scanning multiple product labels or location codes simultaneously.
Storing	Multi-scanning simplifies labeling and tracking during storage. Operators can scan multiple items or shelves at once, collecting only preselected codes and predefining the order they transmit to the WMS.
Order fulfillment	Multi-scanning excels by allowing users to predefine barcode sequences ensuring swift and accurate scanning of multiple items in a batch, streamlining the fulfillment process.
Picking	Multi-scanning supports batch picking by scanning multiple items or containers simultaneously. The ability to preselect and predetermine barcodes simplifies and refines the process.



CONTINUOUS SCANNING

Continuous Scanning is focused on volume and speed, advantageous for use cases like receiving, inventory arrivals, shipping, transportation, reverse receiving, put away, storing, and incoming goods. The feature allows the user to capture up to ten barcodes in a single scan by holding the trigger and hovering over barcodes in the desired order. The ability to rapidly scan a significant number of barcodes without repeated button pushing dramatically elevates workflow speed and operational efficiency. When the order of barcodes is less significant, workers can swiftly collect and transmit data to the warehouse management system up to ten times faster with the continuous scanning feature. This greatly reduces fatigue and improves daily productivity as this feature can be used across use cases.

Table 2: Continuous Scan Benefits by Use Case

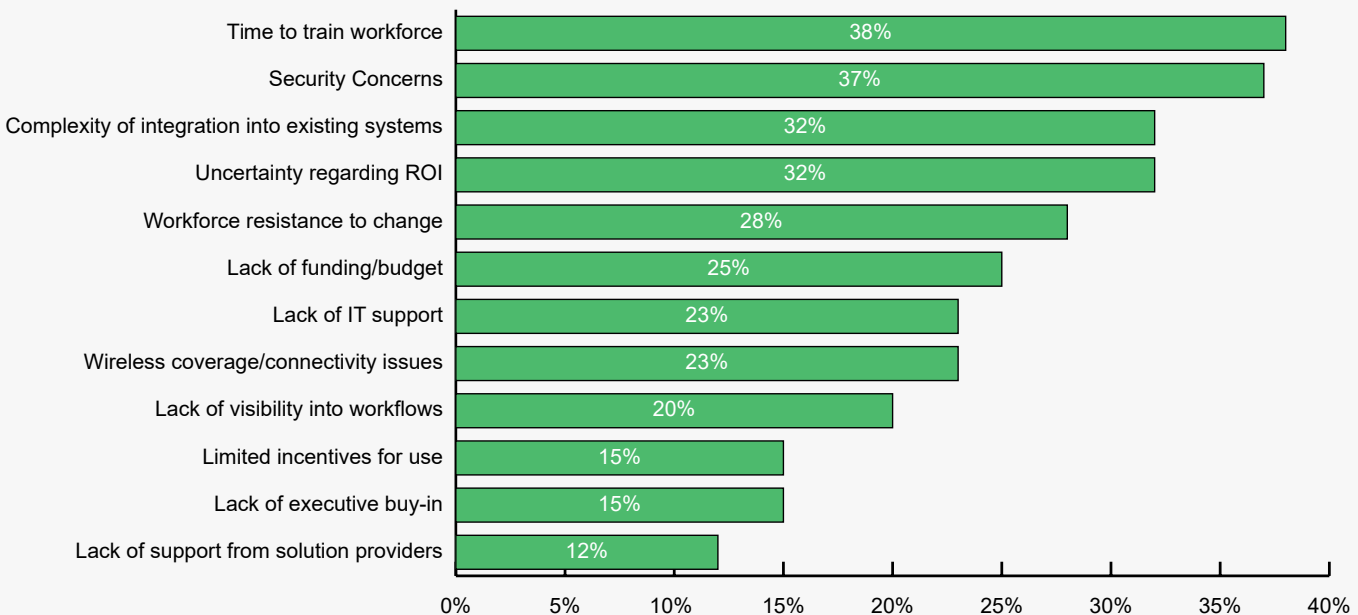
Use case	Continuous Scanning benefit
Receiving	Continuous scanning enables swift and accurate barcode data capture during unloading, improving receiving efficiency.
Inventory Arrivals	Continuous scanning rapidly updates inventory records for newly arrived items, reducing manual entry time and errors.
Shipping	Continuous scanning streamlines order fulfillment by allowing quick scanning of items during shipping preparation.
Transportation	Continuous scanning facilitates efficient verification and tracking of items during loading onto vehicles, reducing loading times.
Reverse Receiving	Continuous scanning expedites the reverse receiving process by enabling rapid scanning of multiple returned items.
Put Away	Continuous scanning accelerates the put-away process by seamlessly scanning multiple items or location codes.
Storing	Continuous scanning simplifies labeling and tracking during storage operations, enhancing efficiency.
Incoming Goods	Continuous scanning enhances efficiency during the arrival of goods by allowing seamless scanning of multiple items.

LOGISTICS TECHNOLOGY INVESTMENT & INTEGRATION KEY SUCCESS REQUIREMENTS

Given the recent level of warehouse technology innovation and the growing options available to practitioners to address their automation and labor productivity requirements, it is perhaps unsurprising that the new technology integration challenges facing organizations are only growing. When investing in new technology, it is key to consider time to value; the amount of time it takes for a particular investment to start delivering tangible benefits.

In the warehouse environment, swift and effective integration can alleviate some technological challenges organizations face. Advanced scanning features like Multiscan and Continuous Scanning can also improve time to value through the speed, efficiency, and accuracy that they provide to warehousing workflows. According to a study by VDC Research, when deploying digital and mobile technologies in the warehouse environment, some of the leading challenges include time to train the workforce, security concerns, and complexity of integration into existing systems.

Figure 2: What are the leading challenges when deploying mobile device solutions to warehouse workers?



Source: 2023 Enterprise Mobility Buyer Behavior Survey; n=420)

TIME TO TRAIN WORKFORCE

While the goal of bringing advanced technology into the warehouse is to increase efficiency and foster cost savings, the road to these benefits is not always straightforward. Workers must be trained in these new technologies, which can often be a long and involved process resulting in suboptimal time to value. Deploying easy to use and intuitive solutions like ProGlove's line of wearable scanners allows organizations to realize the benefits of new technology faster, as employees will easily reach or return to full productivity promptly. Utilizing features like Continuous Scanning that accelerate and simplify workflows across use cases will facilitate training and boost long-term employee satisfaction. Reducing the time spent to train the workforce, which is the top challenge decision makers identified when deploying mobile device solutions, greatly limits downtime, something warehouse organizations can't afford with e-commerce and the extremely high demands for rapid order fulfillment.

COMPLEXITY OF INTEGRATION INTO EXISTING SYSTEMS

As decision makers are faced with an ever-growing list of technologies to evaluate and consider, time to value becomes a major challenge when introducing new solutions. Advanced technology can be leveraged to considerably improve employee satisfaction and warehousing workflows, yet many projects never move past the pilot phase. While great, these benefits can only be recognized if the new technology is compatible with an organization's existing WMS. New technology that necessitates a complete or partial rework of the system in place is unlikely to prove worthwhile for a warehouse organization. This has been a challenge for organizations, discouraging the adoption of solutions that will ultimately help them keep up with consumer demands. Software like ProGlove's INSIGHT, that allows seamless scanning integration with the WMS is a must for organizations striving for optimized time to value.

INSIGHT simplifies the processes of pairing, managing, and monitoring scanning devices while affording organizations the ability to track their device usage and battery charging patterns, find lost devices, and remotely apply device configurations and firmware updates. Software like INSIGHT addresses WMS integration by allowing organizations to implement business rules between the scan and the WMS. Paired with Multiscan, workers can scan up to five times more barcodes in a single trigger, automatically transmitting the desired barcodes in the correct order. The level of WMS and scanning control granted by INSIGHT is extremely valuable to organizations as they can adjust the software to their unique workflows, reducing errors and improving productivity.

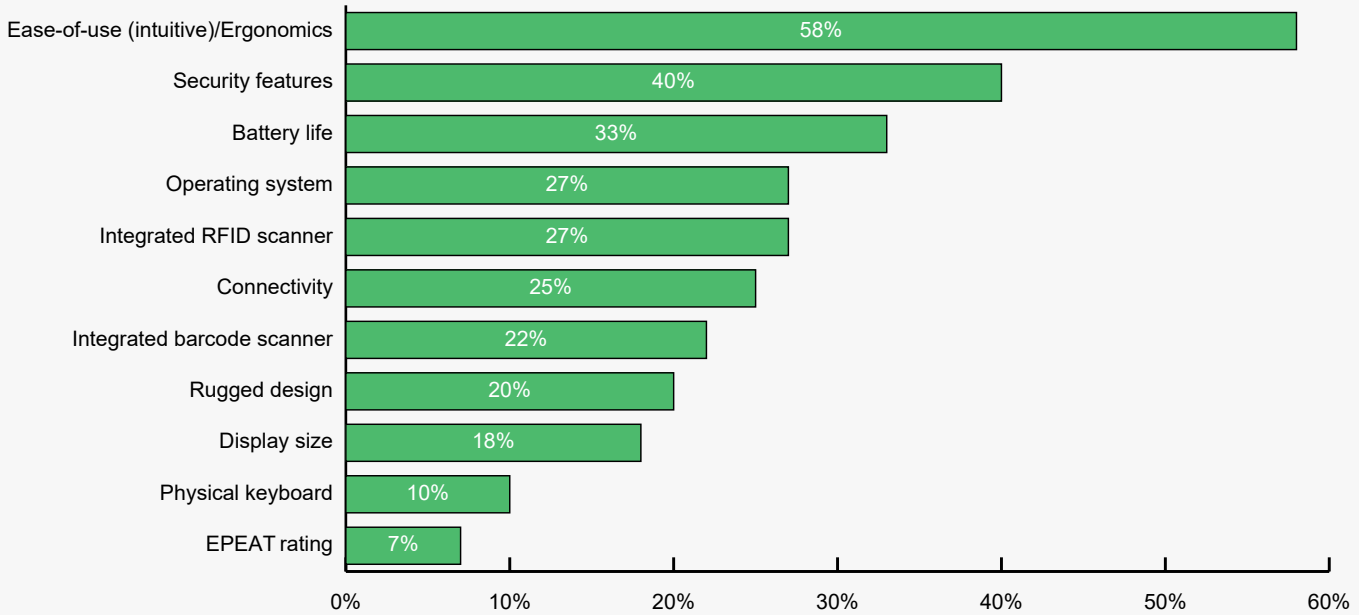
ADVANCED FUNCTIONALITY MODERNIZES SCANNING WORKFLOWS TO ADDRESS GROWING OPERATIONAL CHALLENGES

Labor remains essential to the success of warehouse operations, yet challenges persist for many organizations. Legacy solutions necessitate extensive practice to ensure workers understand the features and capabilities of a device. Reducing the time required for a warehouse employee to reach full productivity, which on average is 3.5 weeks, according to a study by VDC Research, is a critical factor in satisfying demands for order fulfillment. Difficulties with labor scarcity, high turnover, onboarding, and training have organizations rushing to find solutions.

Workers are struggling to keep up with the order volume and required speed and efficiency demanded by consumers for fulfillment. They are also straining to keep track of orders coming from various channels. The prevalence of legacy solutions with cumbersome interfaces and technologies that often get in the way or interfere with workflows remains a fundamental challenge that organizations must overcome.

Key to the efficient application of labor while also ensuring an engaged workforce is equipping/aligning warehouse workers with the right (digital) tools. Replacing legacy mobile devices with the right solution is vital, as it could be the decisive factor in future organizational success. Combined with easy-to-use and ergonomic wearable technology, Multiscan and Continuous Scanning are advances that solve the challenges associated with amplified consumer demand and employee dissatisfaction. In their study, VDC Research found the leading feature driving the adoption of mobile devices for warehouse workers is ease-of-use (intuitive)/ergonomics.

Figure 3: When evaluating mobile devices for warehouse workers, what are the primary features driving adoption?



Source: 2023 Enterprise Mobility Buyer Behavior Survey; n=420)

ERGONOMIC SOLUTIONS EXPEDITE PRODUCTIVITY

Rapidly achieving full productivity is critical for warehouse organizations. The intuitive and ergonomic design of mobile/scanning solutions plays a significant role, providing workers with confidence and comfort from day one. Multiple barcode scanning features like Multiscan and Continuous Scanning bolster this confidence by streamlining tasks while providing other prolonged benefits to warehousing and logistics workflows. In addition to fast-tracked productivity, ergonomic scanning solutions accelerate workflows leading to on-time shipping and satisfied customers. Intuitive WMS integration prevents errors in properly completing orders and accurately documenting them, hurdles many organizations face with legacy solutions. Scanners with Advanced Scanning synergize to achieve this coordination while improving quality of life for employees. Decision-makers recognize the importance of user-friendly and ergonomic mobile devices in warehouse and logistics settings to ensure satisfaction among employees and customers.

WEARABLE TECHNOLOGY STREAMLINES WAREHOUSE WORKFLOWS

Wearable solutions have evolved considerably to offer workers today a much more ergonomic and lightweight device designed to support specific workflows, especially in the glove-worn/top-of-hand form factor. Whereas traditional scanners lead to fatigue, employee dissatisfaction, and ultimately lower productivity that contributes to a lack of on-time delivery, wearable solutions enable workers to use both hands freely while simultaneously scanning products. Wearable solutions are not only lightweight but eliminate the requirement for workers to continuously grip, pick up, and put down traditional scanners. The benefits of “hands-free” wearables are inherently tied to labor-intensive warehouse workflows such as picking, packing, sortation, and more. Leveraging Multiscan and Continuous Scanning on wearable technology enhances workflows across use cases leading to more production, precision, and efficiency. These enhancements are empowering warehouse organizations to hit on their initiatives to increase on-time shipping/shipping speed, reduce labor costs, and improve perfect order rate while concurrently fostering employee confidence, satisfaction, and retention.

ABOUT THE AUTHORS



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Elliot is an analyst supporting syndicated market research programs within VDC's Enterprise Mobility Practice. Holding a BA in Mathematics from Ithaca College, he brings a strong analytical foundation and a passion for problem-solving to the team. He looks forward to expanding his knowledge while he grows as an industry analyst.

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ABOUT VDC RESEARCH



Founded in 1971, VDC Research provides in-depth insights to technology vendors, end users, and investors across the globe. As a market research and consulting firm, VDC's coverage of AutoID, enterprise mobility, industrial automation, and IoT and embedded technologies is among the most advanced in the industry, helping our clients make critical decisions with

confidence. Offering syndicated reports and custom consultation, our methodologies consistently provide accurate forecasts and unmatched thought leadership for deeply technical markets. Located in Southborough, Massachusetts, VDC prides itself on its close personal relationships with clients, delivering an attention to detail and a unique perspective that is second to none.

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ABOUT PROGLOVE



Founded in 2014, ProGlove provides industrial wearable scanning solutions. With its hardware and software products, ProGlove increases productivity, safety and quality for more than 2,000 customers in warehousing, logistics, manufacturing and retail. ProGlove solutions enable users to capture and

analyze data quickly and easily. ProGlove's customers include well-known organizations such as BMW, DHL, Gap Inc. and Lufthansa Technik Logistik Services. ProGlove is headquartered in Munich, Germany, with additional offices in Chicago (USA), Coventry (UK) and Belgrade (RS). The company employs more than 350 people from over 30 countries. More information is available at: www.proglove.com.