



REINVENTING THE SUPPLY CHAIN:

THE FUTURE OF FULFILLMENT VISION STUDY

CONFRONTING LOGISTICS CHALLENGES IN AN
OMNICHANNEL SHOPPING LANDSCAPE



ZEBRA'S FUTURE OF FULFILLMENT VISION STUDY

Zebra Technologies commissioned a global research study to gain a richer understanding of how manufacturers, retailers and logistics firms are preparing to meet the growing needs of the on-demand economy. Surveys were designed to reveal plans, implementation levels, experiences and attitudes toward omnichannel logistics.

TOP TRENDS



E-COMMERCE

89% agree e-commerce is driving the need for faster delivery, spiking concern and investment



INVENTORY ACCURACY

Respondents estimate their current inventories are **66% accurate**



DIGITIZATION OF THE SUPPLY CHAIN

55% of organizations currently use pen and paper to manage omnichannel logistics



INNOVATION

61% say automation is disrupting the industry

STATE OF THE INDUSTRY

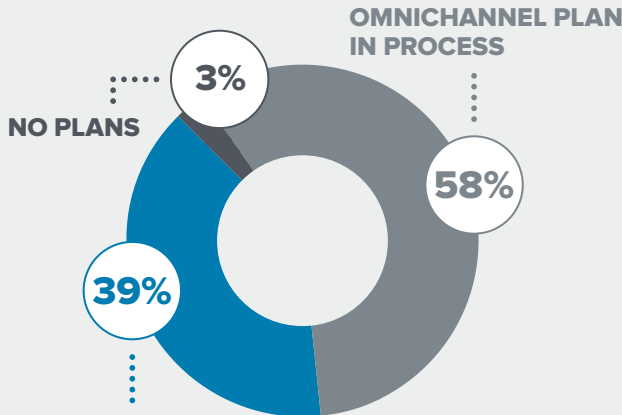
A \$2.3 trillion global e-commerce market reflects how profoundly shopper expectations have recalibrated worldwide.¹ Today’s consumers have been rewired by digital disruption. That always-connected, tech-savvy shopper expects a seamless, faster purchasing journey, whether she’s buying online and picking up in store or wants her merchandise delivered in two hours to her door.



In turn, a digital transformation is rippling through the retail supply chain, dictated by the moment-to-moment wants and whims of consumers forever changed by the Internet’s endless — and instant — buying possibilities. The result is a retail ecosystem in flux and it is shaking the supply chain at its very core.

To succeed in the new normal, retailers, manufacturers and logistics companies are collaborating and swapping roles in uncharted ways to meet shoppers’ omnichannel product fulfillment and delivery expectations in a plot that is still unfolding. Companies are turning to digital technology and analytics to bring heightened automation, merchandise visibility and business intelligence to the supply chain to compete in the on-demand consumer economy. Although an estimated 73% of consumers are omnichannel shoppers today (and they spend more than single-channel consumers),² only 39% of supply chain respondents believe they’re operating at an omnichannel level, the Zebra Technologies study revealed.

RESPONDENTS CHARACTERIZE THEIR ORGANIZATION’S OMNICHANNEL STRATEGY



OPERATING AT OMNICHANNEL LEVEL

| LOGISTICS | RETAIL | MANUFACTURING |
|---|-------------------------------|--|
| 45% POSTAL, COURIER, FREIGHT | 38% STORE FRONT | 58% PHARMACY |
| 42% THIRD-PARTY LOGISTICS, WAREHOUSE, STORAGE | 28% NON-STORE FRONT | 45% FASHION, APPAREL |
| | | 38% COMPUTER, ELECTRONICS |
| | | 29% CONSUMER PACKAGED GOODS, FOOD & BEVERAGE |

DIGITAL TRANSFORMATION OF THE SUPPLY CHAIN

Meeting shoppers’ omnichannel product delivery and fulfillment expectations calls for a digital transformation of the supply chain that addresses key pain points. Inventory allocation, reducing backorders and replenishment efficiency top the hurdles facing logistics companies with omnichannel fulfillment, the study found. That comes as little surprise as merchants, manufacturers and logistics firms navigate an ecosystem built for a single channel brick-and-mortar shopping landscape, ones that are now taxed by a rapidly growing e-commerce market.

To adapt, new business models are taking hold as the lines between retailers, manufacturers and logistics firms start to blur. These longtime, largely siloed, solo acts are increasingly acting in concert to rise to the demands of a dynamic, 24/7 bricks-and-clicks shopping world.

NEW FULFILLMENT AND DELIVERY OPTIONS

Dramatic changes are beginning to materialize as industry players race to offer consumers fast, flexible and even free product fulfillment and delivery. Consumers want a hassle-free shopping trip whether they’re buying in-store, from their mobile phone, desktop computer or some combination of the three. Stores are increasingly doubling as distribution centers that fulfill online orders. Logistics companies are starting to provide product fulfillment. Manufacturers are drop-shipping merchandise to expedite retail deliveries. Retailers are also partnering with third-party technology upstarts to handle last-mile delivery.

¹ EMarketer, Worldwide Retail and Ecommerce Sales: eMarketer’s Estimates for 2016–2021; ² Harvard Business Review, A Study of 46,000 Shoppers Shows That Omnichannel Retailing Works

THE OMNICHANNEL CHALLENGE

E-commerce is growing at a staggering pace, projected to generate \$4.479 trillion in retail sales by 2021, soaring over 140% from \$1.859 trillion in 2016.³ And it's forcing decision makers to shift to a robust omnichannel fulfillment strategy that meets the modern consumer's needs.

86%

of respondents agree that the amount of capital investment and operating expense required for omnichannel is a challenge

Today, 41% of consumers worldwide use two or more channels during the purchase process.⁴ According to Zebra's 10th annual shopper study, 51% of online shoppers ship to home, 35% pickup in store and 29% ship to an alternate location. Accurately fulfilling these orders 100% of the time requires inventory visibility across the entire supply chain.

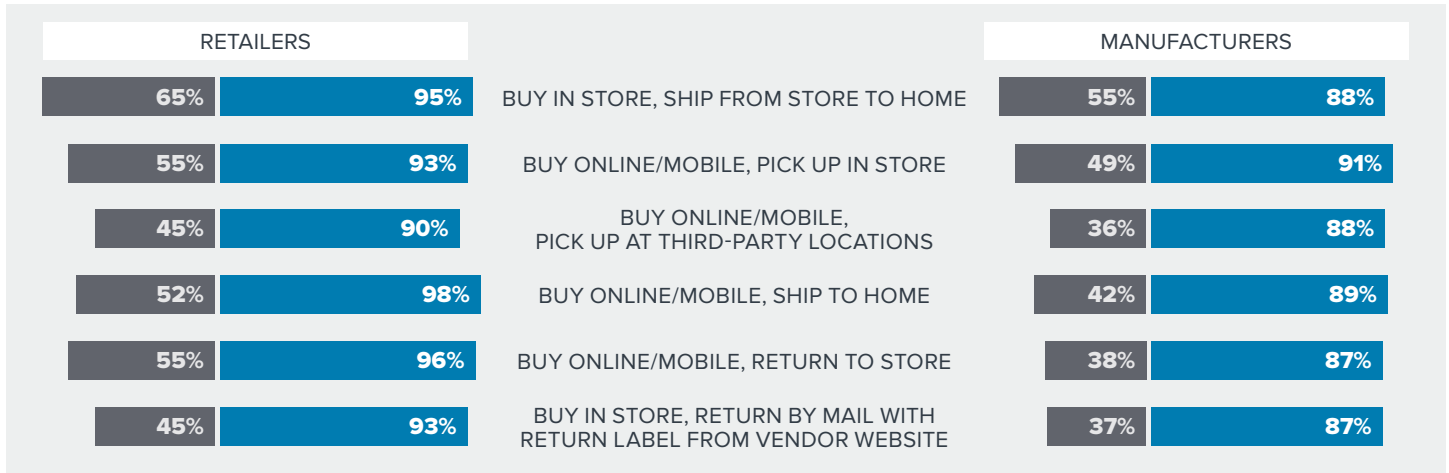
Unfortunately, inventory systems haven't yet caught up and are unable to provide the level of inventory granularity necessary to facilitate strong customer satisfaction. Survey respondents

estimate that their inventories are about 66% accurate today. Clearly this level of preciseness is woefully inadequate in a buyer's market where shopper tolerance of out of stocks, for one, is diminishing as countless alternatives are just a click away.

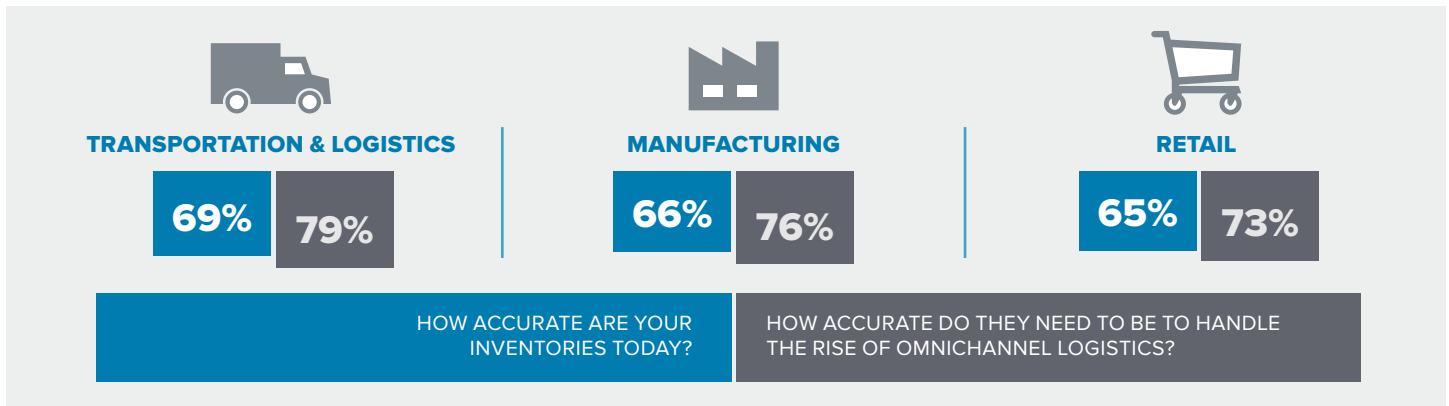
Supply chain and operations leaders must swiftly adjust to the changing world. The race is on to implement omnichannel-primed logistics systems and processes to ensure merchandise fulfillment is scalable as online sales volumes continue to escalate. But that's a formidable task. Indeed, 86% of respondents cited the capital investment and operating costs of implementing an omnichannel operation as a challenge. Yet, companies must address this issue as more and more consumer's physical and digital worlds are converging and they are buying "phygitally."

RETAILERS AND MANUFACTURERS REPORT COMPLEX PURCHASING MODELS

TODAY 2023



INVENTORY ACCURACY



³ EMarketer, Worldwide Retail and Ecommerce Sales: eMarketer's Estimates for 2016–2021; ⁴ ForeSee, Foresee Experience Index: Retail CX Rankings



TURNING STORES INTO FULFILLMENT CENTERS

91%

AGREE MORE AND MORE RETAILERS WILL CONTINUE TO TURN STORES INTO FULFILLMENT CENTERS

86%

AGREE CLICK AND COLLECT (BUY ONLINE/ PICK UP IN STORE) WILL BECOME THE DEFAULT DELIVERY METHOD

76%

OF RETAILERS SURVEYED USE STORE INVENTORY TO FULFILL ORDERS

68%

EXPECT STORE USE OF INVENTORY TO FULFILL ORDERS TO GROW IN THE NEXT FIVE YEARS

CHANGING ROLES AND INCREASING COLLABORATION

A new phenomenon is occurring in the retail sector as it shifts to serve its omnichannel consumer base. In a quest to boost online fulfillment performance and get their digital-physical profit model right, retailers are leveraging one of their greatest assets: their fleet of stores. At the same time, manufacturers are updating their systems to accommodate both bulk and SKU-level shipping so that they too can serve consumers directly.

Merchants are diving into “ship from store,” retrofitting locations to double as online fulfillment centers and shrinking selling space to accommodate e-commerce pickups and returns. The study revealed that 76% of retailers use store inventory to fill online orders, and six out of 10 expect that to grow. In fact, some of the biggest retailers now fill digital orders from every one of their brick-and-mortar locations.

The strategy taps stores to fulfill digital purchases to defray the high transportation costs of online orders, which have been eating into retail profit margins. By offering click and collect (buy online pickup in store) retailers skirt the cost of delivering to shoppers’ homes, while encouraging add-on sales. That’s because consumers that come in to pick up their digital order often end up making impulse purchases.

Industry leaders are also calculating that a network of stores can get digital orders faster and more efficiently to the consumer than a handful of centralized warehouses. This is particularly critical amid the growing consumer expectation for same day and even two-hour delivery. Optimizing the distribution network is key to omnichannel success.

Meeting the unfolding demands of the omnichannel retail landscape is also fostering newfound collaborations between manufacturers and retailers. Suppliers are increasingly drop-shipping merchandise directly to consumers for their retail partners’ online operations. The study revealed that worldwide 32% of retailers request drop ship from manufacturers and 73% of manufacturers expect this to increase up to 10% over the next five years.

SHIPPING CAPABILITIES FOR IN-STORE AND ONLINE FULFILLMENT

TODAY 2028



63% **96%**

Stores enabled to fulfill web orders

52% **95%**

Stores enabled to ship to warehouse or direct to consumers

50% **96%**

Stores enabled to transfer product between store locations

45% **93%**

Direct ship from manufacturer or other retailer

44% **96%**

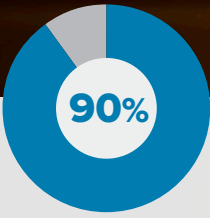
Dedicated fulfillment centers for online

41% **95%**

Shared fulfillment centers for online and offline

40% **93%**

Regional/near shoring of fulfillment centers



90% of respondents agree that delivery is an extension of a retailer's brand



THE DELIVERY RESURGENCE: THE NEED FOR SPEED

E-commerce and an “I-want-it-now” instant-gratification mindset are feeding the consumer craving for faster and faster delivery. Industry players are feverishly working to fulfill that demand and still turn a profit — a challenge given the high cost of transporting goods.



EXPECTED DELIVERY WINDOW FOR FUTURE SAME-DAY ORDERS

32%
2 hours or less

44%
3 to 4 hours

24%
5+ hours

Decision makers are testing a vast array of delivery strategies to trim time, distance and cost from shipping orders. Retailers are offering curbside pickup, warehouse pickup and merchandise pickup at third-party locations such as parcel shops and lockers. And tech startups like Instacart, Qourier and UberRush have entered the fray to speed fulfillment.

Solving the delivery challenge has given rise to a crowdsourcing model whereby retailers, manufacturers,

logistics companies and technology newbies are working collaboratively to get products in the hands of shoppers faster. That comes as little wonder, as some of the world's biggest retailers are increasing their same-day delivery capabilities to compete with online retailing giants. Within five years, 78% of logistics companies surveyed expect to provide same-day delivery and in 10 years 39% anticipate delivery within a two-hour window.

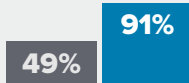
For brands, speed stokes loyalty among time-starved shoppers. Today's buyers have come to value companies that offer delivery perks such as the ability to track a purchase and text notifications alerting them that their order “is just four minutes away!” Importantly, more decision makers view merchandise delivery as an extension of the retailer's brand in the customer experience.

EMERGING SHIPPING OPTIONS

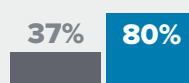
TODAY 2028



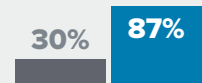
Dedicated Delivery Person
Delivery service picks up parcels at a consolidation point



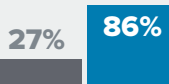
Store Fleet or Store Staff
Car, bike, foot



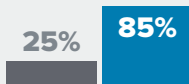
Bicycle Couriers
A small number of parcels delivered by bicycle



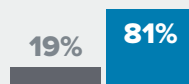
Crowdsourcing
Driver network selects a specific delivery order



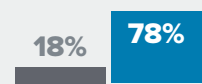
Semiautonomous Ground Vehicles
Delivery person completes administrative tasks while vehicle does the driving



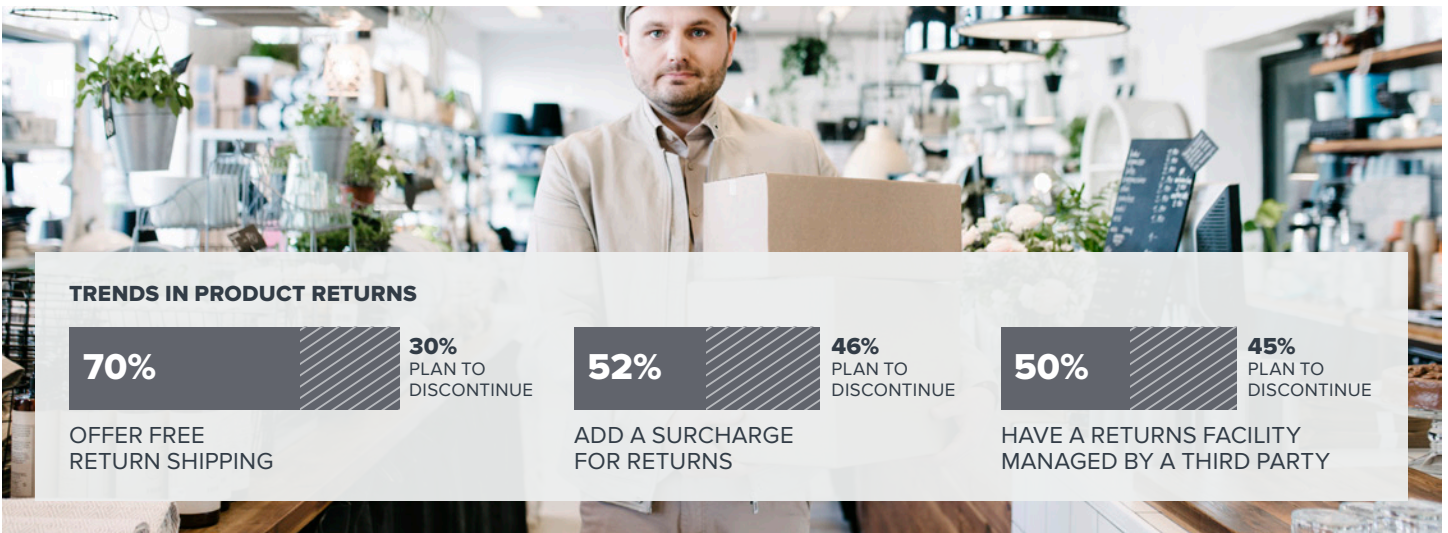
Autonomous Ground Vehicles
Parcels are delivered to a third-party location without human intervention



Drones
Autonomous aircrafts carry parcels along the most direct route at a relatively high speed



Droids
Small autonomous vehicles deliver parcels via sidewalks rather than streets



GRAPPLING WITH RETURNS

The rising consumer demand for free and fast product delivery correlates with a surge in product returns. Fulfillment and returns go hand in hand; they represent the two halves of the supply chain. While fulfillment means bringing products to market, returns flow the product in reverse back through the supply chain.

87%

of respondents agree accepting and managing returns is a challenge

55%

of retailers plan to employ third-party facilities to manage returns

Handling product returns is not a new challenge for retailers and brands, but it's become an infinitely bigger concern in an omnichannel marketplace. It is also extraordinarily costly and is eating into already pressured profit margins: Worldwide, shoppers return an estimated \$642.6 billion in goods each year.⁵

Managing returns efficiently and cost effectively is a

challenge that retailers must take on. Shoppers increasingly expect free returns, and a hassle-heavy return process turns off 80% of shoppers, according to a ComScore Study.⁶

Still, reverse logistics capabilities remain underdeveloped and significant opportunities for improvement remain, the Zebra

study revealed. Many retailers seem uncertain as to how to improve their processes. In fact, 68% of surveyed retailers agree that returns for online orders are a challenge with two out of 10 viewing it as a significant challenge.

Merchants are increasingly exploring new models to offset the costs of returns. The study uncovered that 52% of retail respondents add a surcharge for returns today and 54% have no plans to change this in the future. Of the 48% of merchants that do not currently add a surcharge for returns, more than half plan to do so in the future.

Decision makers are testing solutions such as leveraging the store as a product returns hub. A resounding 70% of surveyed executives agree that more retailers will turn stores into fulfillment centers that accommodate product returns. According to the study, the majority of retailers that currently do not offer free shipping, free returns or same-day delivery plan to do so and expect to engage third-party firms to manage the returns process in the future.



68% of retailers globally ranked returns of online orders as a challenge

BY REGION

83%

LATIN AMERICA

74%

ASIA PACIFIC



66%

EUROPE

51%

NORTH AMERICA

⁵ MarketWatch, Consumers Return \$642.6 Billion in Goods Each Year; ⁶ RetailNext, The Real Cost of Returns for Retailers

ENABLING INTELLIGENT FULFILLMENT

Supply chain decision makers worldwide are investing in an array of tools to streamline omnichannel merchandise fulfillment. Solutions range from edge technologies – which automate worker tasks such as picking and sorting merchandise at a distribution center – to demand forecasting and planning applications that boost the accuracy of revenue forecasts and better align inventory levels via data analytics.



In two to three years, tablets and handheld mobile computers with barcode scanners will top the devices used for omnichannel logistics. The shift marks an upgrade from manual systems, such as pen and paper spreadsheets for inventory validation, to handheld mobile devices that offer real-time access to warehouse management systems.

Not surprisingly, supply chain executives are outfitting workers with mobile computers that enable quick, automated inventory and cycle counting. They also grant them on-demand inventory lookup and product information to fulfill orders no matter where a shopper purchase originates – a physical store or a smart-phone – from wherever the inventory resides – in the retail stock room, fulfillment center at the manufacturer or on a delivery truck. This in-the-moment inventory visibility enables nimble omnichannel order fulfillment from any link in the supply chain.

Meanwhile, radio-frequency identification (RFID) technology and inventory management platforms are expected to grow the most in the next few years. RFID-enabled software, hardware and tagging solutions offer up-to-the-minute, item-level inventory lookup, heightening inventory accuracy while reducing out of stocks, overstocks and replenishment errors.

Additionally, demand forecasting and planning as well as workforce management tools are being implemented today by 50% of logistics companies surveyed. What’s more, workforce management technologies will also see a rise in investments in the next year by 32% of the same firms.

MOVING FROM MANUAL TO DIGITAL



HANDHELD COMPUTERS WITH BUILT-IN BARCODE SCANNERS



HANDHELD BARCODE SCANNERS



TABLETS



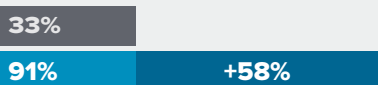
BARCODE LABEL, THERMAL PRINTERS



WEARABLE MOBILE COMPUTERS



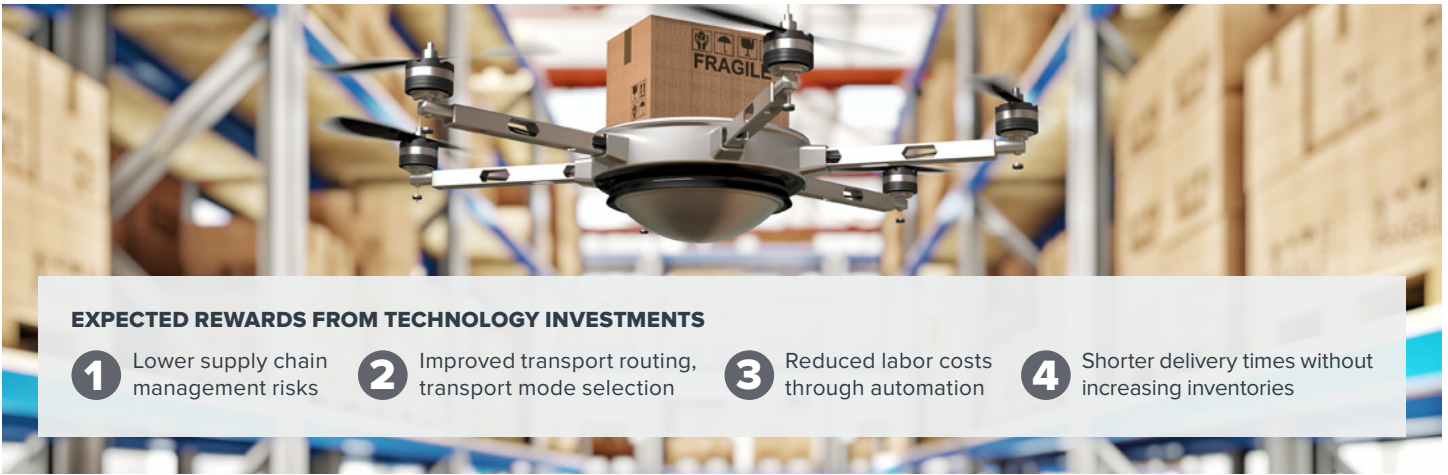
VEHICLE-MOUNTED MOBILE COMPUTER



RFID-BASED INVENTORY MANAGEMENT SYSTEM

WORKFORCE MANAGEMENT TOOLS ON THE RISE

| | TODAY | 2028 |
|---|-------|------|
| Demand forecast planning | 55% | 97% |
| Labor workforce management | 48% | 98% |
| Freight document handling and archiving | 48% | 98% |
| Transportation management system | 45% | 97% |
| Warehouse management system | 44% | 97% |
| Tracking and event management | 41% | 96% |
| Inventory planning and management | 40% | 97% |
| Route optimization and scheduling | 39% | 97% |
| Sensors and monitoring | 37% | 96% |
| Network optimization system | 37% | 97% |
| Electronic interfaces with carriers | 36% | 98% |
| Electronic interfaces with shippers | 35% | 98% |
| Yard management system | 34% | 94% |



EXPECTED REWARDS FROM TECHNOLOGY INVESTMENTS

- 1 Lower supply chain management risks
- 2 Improved transport routing, transport mode selection
- 3 Reduced labor costs through automation
- 4 Shorter delivery times without increasing inventories

NEXT-GENERATION SUPPLY CHAIN TECHNOLOGIES

In the digital economy, manual processes left over from the pre-Internet era continue to vanish from warehouse and fulfillment operations. Decision makers looking to the future said next-generation supply chains will reflect connected, business-intelligence and automated solutions suited to the on-demand, omnichannel landscape.

E-commerce has given way to a dramatic rise in distribution centers and warehousing operations placing enormous pressure on the already scarce supply of skilled labor resources. To counteract the labor concerns, supply chain decision makers are forecasting that automation will offset the shortages. Survey executives identified the most highly disruptive technologies as drones, driverless/autonomous vehicles and augmented reality.


Next-generation supply chains will utilize robotics and automation to perform traditionally manual tasks such as picking, sorting, inspecting, storing, handling and classifying products to improve overall efficiency, worker productivity and speed to market. Some warehouses are turning to autonomous vehicles to bring merchandise to sortation and packing areas. Others are using drones and RFID for inventory management. The opportunities are seemingly limitless and include wearable

technology, which enables truly hands-free, multi-modal workflows that result in greater worker efficiency and increased productivity. The market for enterprise wearable devices is expected to skyrocket with projected growth of 75% by 2021.⁷

Interestingly, while supply chain executives have highlighted key disruptors, they seem to be taking a wait-and-see approach when it comes to actually investing. Indeed, these technologies are being implemented more as tests to determine their return on investment rather than a full-scale rollout.

Industry players also face the challenge of managing these next-generation technologies across the many moving parts of the supply chain for an effective omnichannel strategy, while implementing them to work seamlessly with existing legacy systems — which is no easy feat.

TRANSFORMATIVE TECHNOLOGY DISRUPTORS

| | | |
|---|--|--|
|  <div style="background-color: #ccc; padding: 5px; margin: 5px 0;">PENETRATION LEVEL</div> <div style="background-color: #0070c0; color: white; padding: 5px; margin: 5px 0;">EARLY-STAGE DISRUPTORS</div> <p>AUTONOMOUS VEHICLES DRONES/ROBOTS AUGMENTED REALITY</p> |  <div style="background-color: #ccc; padding: 5px; margin: 5px 0;">PENETRATION LEVEL</div> <div style="background-color: #0070c0; color: white; padding: 5px; margin: 5px 0;">ADVANCING DISRUPTORS</div> <p>WEARABLE MOBILE TECHNOLOGY MACHINE LEARNING DIGITAL SECURITY</p> |  <div style="background-color: #ccc; padding: 5px; margin: 5px 0;">PENETRATION LEVEL</div> <div style="background-color: #0070c0; color: white; padding: 5px; margin: 5px 0;">MAINSTREAM DISRUPTORS</div> <p>PREDICTIVE ANALYTICS 3D PRINTING INTERNET OF THINGS</p> |
|---|--|--|

NEW TECHNOLOGY IMPLEMENTATION CHALLENGES

- DIFFICULTY IN DEPLOYING, INTEGRATING AND MANAGING NEW TECHNOLOGY
- INTERNAL COORDINATION STRATEGY
- DETERMINING ROI OF NEW TECHNOLOGY
- SAFETY AND TRAINING
- REGULATORY REQUIREMENTS

⁷ Fung Global Retail & Tech



REGIONAL FINDINGS

Industry decision makers worldwide view the growing omnichannel landscape as driving the need for merchandise delivery and fulfillment processes upgraded by digitally-enabled automation, merchandise visibility and business intelligence. But their areas of need and focus vary by region.

85%
rank drones as one
of the most disruptive
technologies

ASIA PACIFIC

In Asia Pacific, 95% of respondents rated e-commerce as the driving need for faster delivery. The region expects to implement same day delivery faster than any other continent and nearly 30% consider returns for online orders as a significant challenge. Drones were ranked by 85% of those surveyed as one of the most important disruptive technologies.

EUROPE

European retailers are increasingly turning to separate facilities to handle online orders and returns. Currently, 52% of merchants surveyed employ third-party logistics firms to handle the complex task of returns. By 2028, dedicated fulfillment centers are expected to grow by over 110% with 93% of retailers planning to employ them for online orders. A clear majority of respondents (68%) view digital security as a disruptive technology.

52%
of retailers employ
third-party logistics firms
to handle returns

93%
agree pressure to
reduce environmental
impact is growing

LATIN AMERICA

In Latin America, 93% of executives agreed that they are facing increasing pressure to reduce the environmental impact of e-commerce caused by reliance on paper-based systems and the surge in the number of delivery vehicles. The region is embracing RFID solutions to enable omnichannel logistics more dramatically than most regions with respondents expecting penetration rates to skyrocket by 2028 for active RFID (95%), Infrared + RFID (91%) and passive RFID (86%).

NORTH AMERICA

In the United States and Canada, manufacturers, logistics companies and merchants ranked current inventory accuracy at 74% and reported needing to be at 83% to handle the rise of omnichannel logistics. Only 44% of companies provide same-day service today trailing all other regions. A resounding 83% classified driverless/autonomous vehicles as disruptive to the industry.

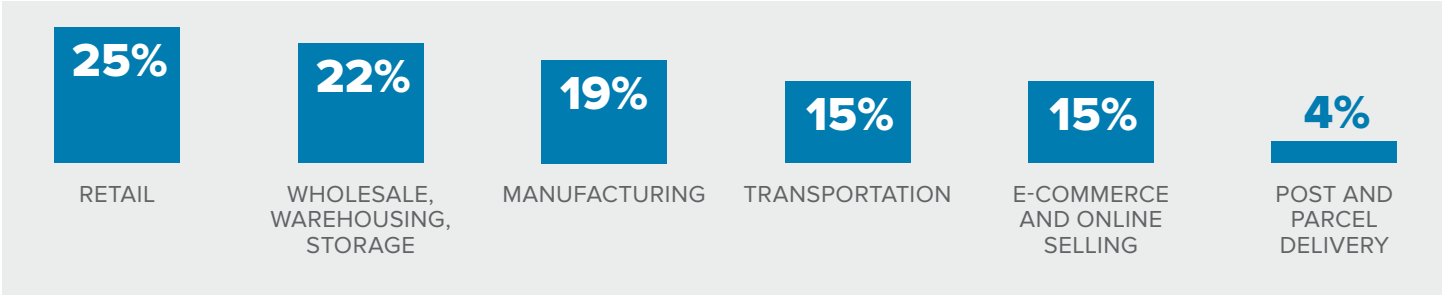
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ABOUT THE STUDY

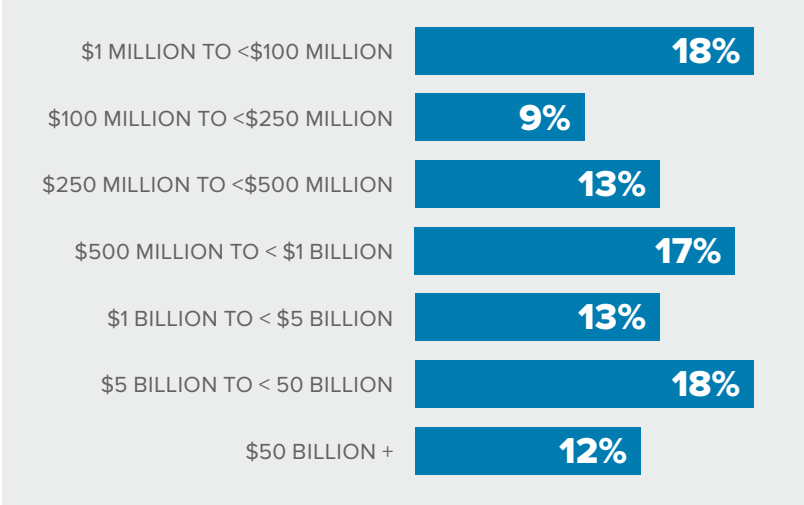
RESPONDENTS BY GEOGRAPHY



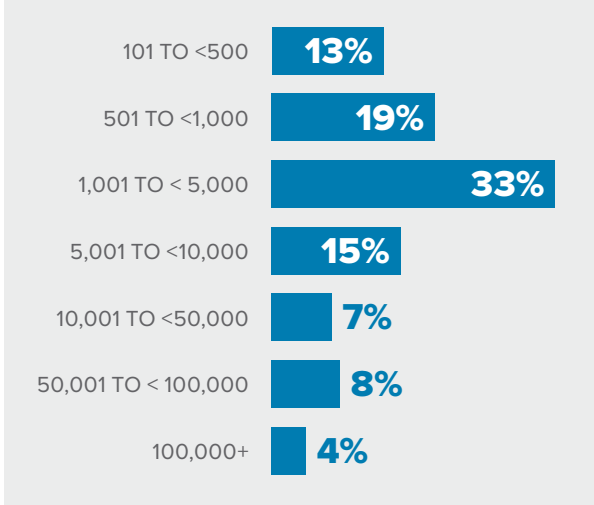
BY INDUSTRY



BY REVENUE



BY NUMBER OF EMPLOYEES





GEARING UP FOR NEXT-GENERATION SUPPLY CHAINS

Surviving and thriving amid the global, digital shopping revolution, in which consumers fluidly browse and buy from their smartphones, computers and in store, calls for a supply-chain makeover.

Pressed to offer consumers fast, flexible and even free product fulfillment and delivery in an omnichannel retail landscape, a crowdsourced, collaborative model is taking shape. Traditional roles are blurring as logistics companies, manufacturers and retailers work to meet the growing on-demand economy via the adoption of business-intelligence supply chain technologies.

In turn, stores are increasingly doubling as distribution centers that fulfill online orders; logistic companies are starting to provide fulfillment and distribution services; and manufacturers are drop-shipping merchandise to expedite retail deliveries. Merchants are also partnering with third-party technology upstarts to speed last-mile delivery.

These next-generation supply chain systems and practices are designed to ensure that merchandise fulfillment is scalable in an omnichannel marketplace.

ABOUT ZEBRA TECHNOLOGIES

Zebra provides unparalleled operational visibility to give enterprises the digital edge they require to thrive in an omnichannel landscape.

For more information, please visit us on the web.
Transportation and Logistics: www.zebra.com/tl
Manufacturing: www.zebra.com/manufacturing
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