



The Impacts of e-Commerce: Fulfillment Challenges and Improvement Priorities

Introduction

The rise in e-commerce is continuing at a remarkable pace. In 2017, consumers spent \$453 billion online, a 16% increase from 2016, according to the U.S. Commerce Department. That's the highest growth rate since 2011.¹

Naturally, this march of e-commerce impacts the fulfillment processes that need to happen in warehouses and other nodes in distribution networks. While traditional channels still need to be served, there is more piece picking and single-line orders to get out the door, and cycle times to hit next-day or even same-day delivery commitments are much tighter than when replenishment to retailers or distributors was the norm. To add to these challenges, this transition in the type and pace of fulfillment work is happening at a time when unemployment levels have plummeted and distribution center (DC) operators are finding labor increasingly difficult to find and retain.

To better understand how companies are managing their e-commerce platforms and related order fulfillment operations, **Peerless Research Group (PRG)**, on behalf of **Modern Materials Handling** and **Honeywell Intelligrated**, surveyed 171 U.S.-based material handling executives. Survey results reveal that while organizations are still looking for solutions to better equip DC managers to control widespread, mission-critical challenges—such as labor management, order processing and tracking, and warehouse and distribution costs—many remain slow to adopt the necessary technologies to improve supply chain productivity.

The results of this survey reveal the key fulfillment challenges and bottlenecks felt by supply chain professionals, including: functionality gaps they see with their systems, as well as their outlook on investment areas, metrics and technologies that can lead to faster, more accurate and adaptable operations.

Some of the most pressing challenges reflected in the survey include filling more orders (faster and at lower costs), reducing errors in filling orders, and finding enough labor to support operations. While the survey does point to an unmet need to put systems in place that help with workforce productivity, given the challenges that exist around labor, a positive sign is that more than half of respondents (nearly 58%) plan to invest in various types of software and technology over the next 12 months.

Leading areas of software investment include well-established categories such as warehouse management system (WMS), warehouse control system (WCS) and transportation management system (TMS) solutions. Solutions that support order picking automation, as well as warehouse execution system (WES) software also were named by respondents as systems they plan to evaluate, purchase or upgrade over the next 24 months. WES is a rapidly emerging category of software that coordinates fulfillment operations within the four walls of a warehouse, releasing orders in a way that synchronizes labor and equipment to efficiently meet customer requirements.

¹ https://census.gov/retail/mrts/www/data/pdf/ec_current.pdf

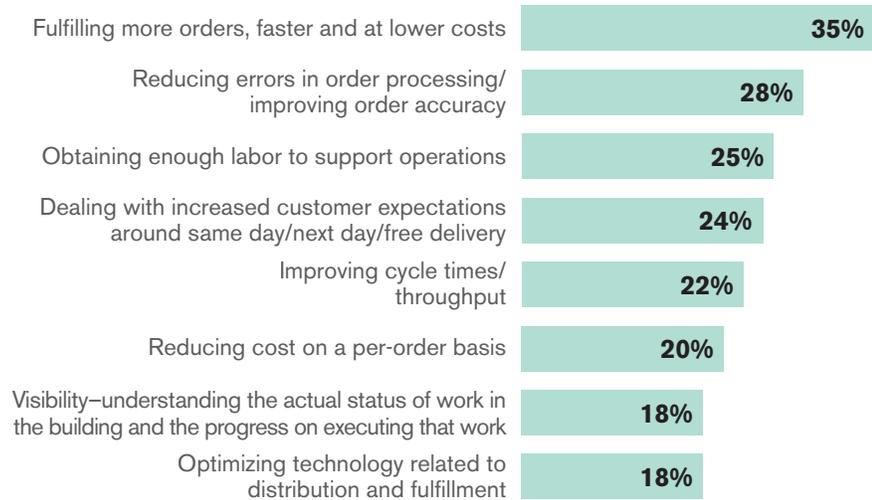
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The Challenges

Satisfying ever-increasing customer demands is placing tremendous strains on fulfillment processes and DC managers. Among our survey group, many reported concerns about their ability to respond to these intensifying challenges. More than one-half said that customer demands have intensified dramatically (51%) during the past 24 months and most others (37%) also contend that while expectations are escalating, the pressures may not be as extreme. As a consequence of these pressures, businesses are more closely looking at the methods in which they are managing their order taking and fulfillment operations. Fulfilling more orders, faster, at a lower cost and with greater accuracy are challenges with which many are grappling. And, to support operations and preserve customer loyalty, the anxieties associated with getting orders out the door with insufficient manpower is also a top concern (25%). (Figure 1)

FIGURE 1

Top order management, fulfillment and distribution challenges

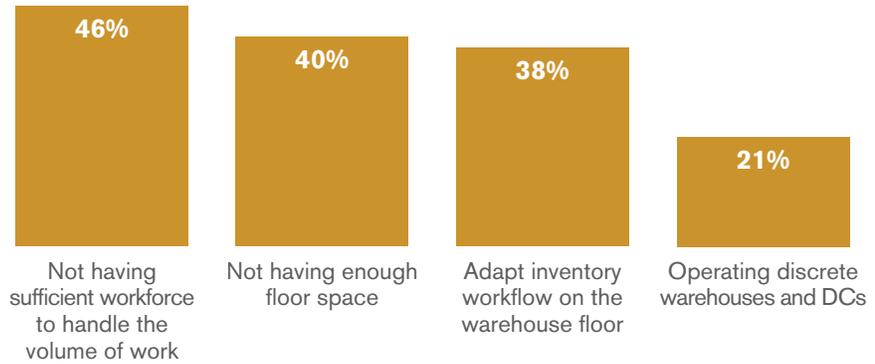


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When it comes to identifying constraints to operational efficiencies, many reported that labor shortages, inadequate work space and sub-standard inventory management processes stand in the way of their organization’s ability to achieve operational excellence. (Figure 2)

FIGURE 2

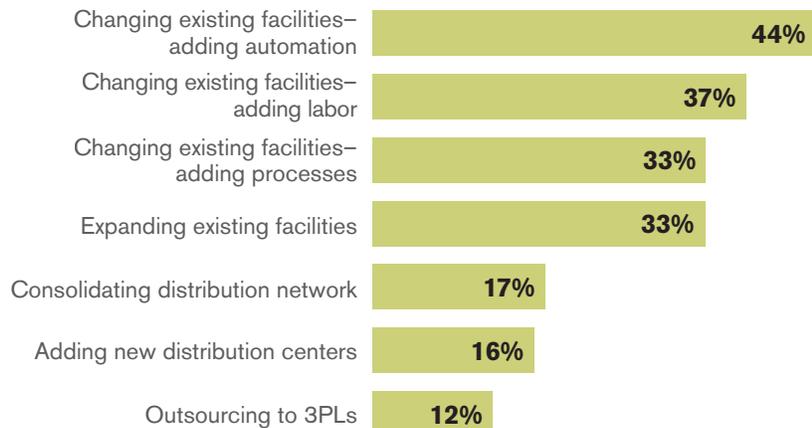
Constraints to operational efficiencies



In response, DC managers are addressing these challenges by making changes to their current facilities. The two most common initiatives include deploying more automated systems (44%) and adding manpower to their current labor force (37%); employing process improvement strategies and expanding the footprint of current facilities are also top of mind. (Figure 3)

FIGURE 3

How organizations are responding to growth requirements



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However, these changes don't come easily. Overall, companies rated their supply chains as merely 'adequate' in their ability to rapidly shift operational tactics. While four out of 10 do consider their dexterity in this manner to be quite good, the majority believe their supply chain architecture is just OK (39%). One out of five companies (21%) judge their supply chain to be sub-par for being agile. (Figure 4)

FIGURE 4

Supply chain's ability to shift operational tactics



Managers reported that bottlenecks related to inventory management (39%) are the most likely deterrents to supply chain adaptability. Order processing, production, as well as delays brought on by suppliers are also common problems among the survey group. (Figure 5)

FIGURE 5

Bottlenecks preventing greater supply chain adaptability

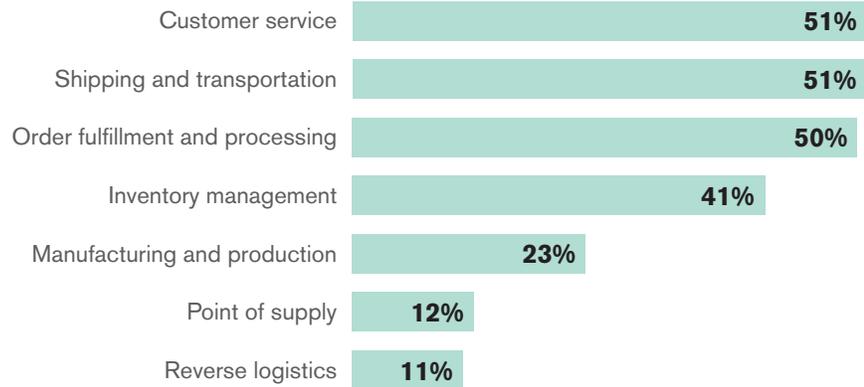


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On the contrary, respondents reported that among those operational aspects that are most capable of quickly transitioning to meet dynamic supply chain requirements, business-critical areas such as customer service, transportation operations and order fulfillment processing ranked the highest. (Figure 6)

FIGURE 6

Aspects of operation that can quickly be transitioned to meet needs

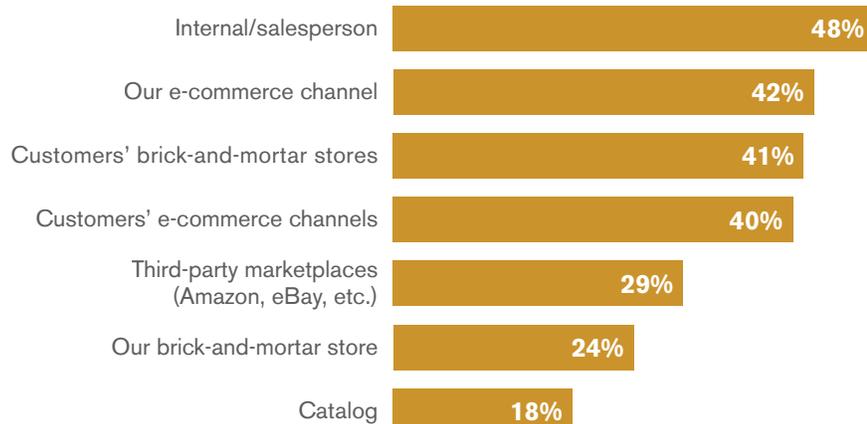


Order Processing Complexities and the Need to Improve Procedures

The challenge of accepting orders across multiple sales channels is at the crux of modern order fulfillment complexities. In fact, many organizations need to juggle orders coming from, on average, three different types of outlets. Any combination of the sales team (48%), their own e-commerce platform (42%), customers' storefronts (41%) as well as customers' e-commerce channel (40%), and third parties such as Amazon, eBay, etc. (29%) are all in play. (Figure 7)

FIGURE 7

Multichannel order mix



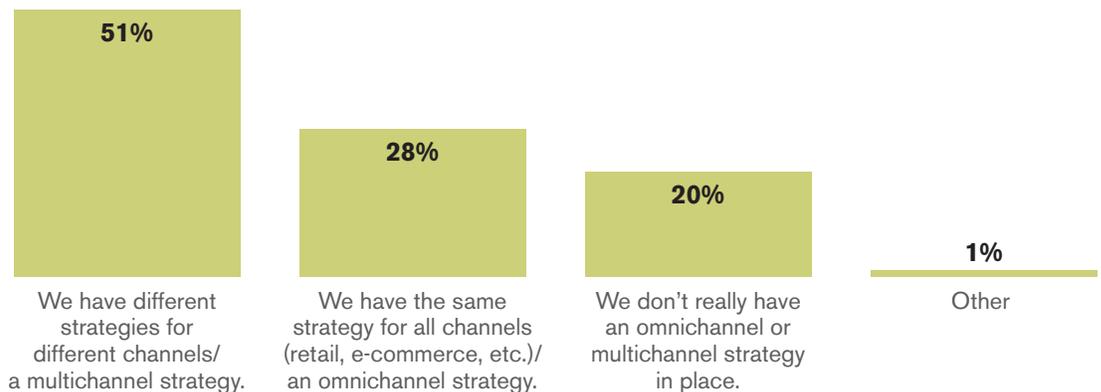
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The survey asked respondents to distinguish between using different strategies and systems to fulfill orders for different channels (i.e., a multi-channel approach) versus using the same basic strategy and systems for multiple channels (i.e., an omni-channel approach). Whatever approach is taken, there are complexities. Operators have to decide whether to fulfill for different channels from different DCs, and if they fulfill for multiple channels in one facility, also decide if they will try to use a common pool of inventory and labor. While bulk storage methods might not be radically different across channels, it is often the case that omni-channel DCs require different approaches to order picking, forward pick area replenishment, and pack/ship operations, depending upon the channel being serviced. Regardless of whether a company employs different strategies for different channels, or is pursuing an omni-channel approach in which a fulfillment center and its systems are able to service multiple channels, operations increasingly need advanced software to manage inventory, replenishment, order releasing and picking/packing operations. This is because of smaller, more frequent orders and the intensive order picking associated with e-commerce, as well as the need to synchronize labor, automation, order releasing and inventory moves.

The majority of organizations surveyed are currently processing orders employing a multi-channel model whereby different platforms are used to handle orders submitted through each sales channel. (Figure 8) Having separate systems and fulfillment processes for different channels can be an effective approach, but forfeits the potential advantages from utilizing a common pool of inventory. An omni-channel approach, conversely, generally adds complexity in areas like coordinating inventory moves and replenishment for different channels, allocating and reassigning labor by channel, and may still require distinct systems for the pick, pack and ship tasks of different channels. Some facilities are able to make omni-channel fulfillment work, but they typically need advanced software to orchestrate resources and material flow, with at least some automation in place to make e-commerce picking more efficient. (Figure 8)

FIGURE 8

Approaches for handling order fulfillment



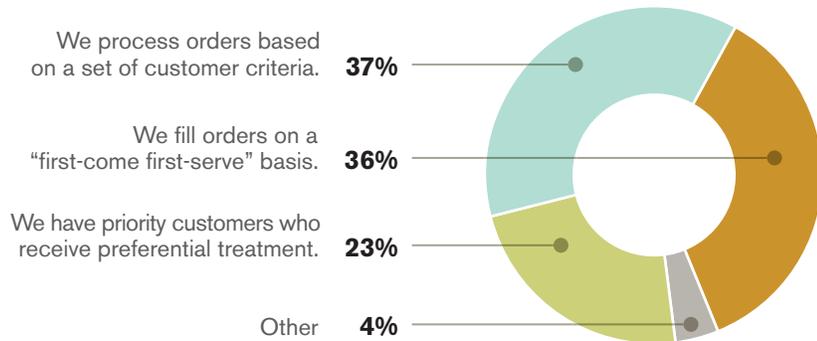
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Organizations also have different strategies for determining which orders to prioritize and fast-track. One-half of the organizations surveyed systematically prioritize orders that require immediate processing and shipping. Having the capacity to process these orders is essential. Two out of three (63%) contend that if urgent orders cannot be processed quickly, customer relationships are put at risk and revenues will be lost.

Operations are inclined to fill orders based on either a set of customer criteria (37%) or on a first-come, first-serve basis (36%); nearly one out of four (23%) prioritize orders and fill purchases based on a preferred-customer policy. (Figure 9)

FIGURE 9

Strategies for determining which orders to prioritize

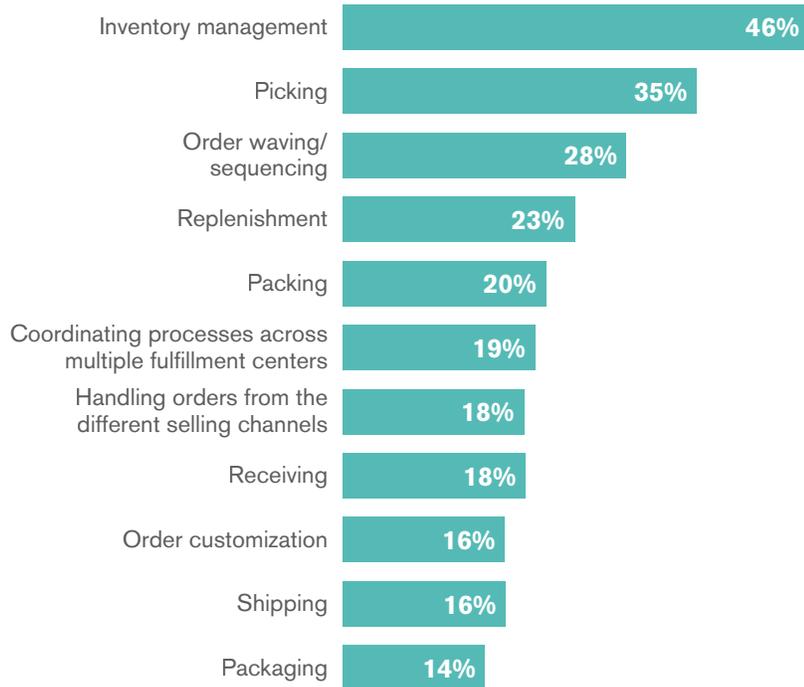


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In terms of functional areas with opportunities for improvements, managers list many phases of the fulfillment process that could benefit from performance upgrades. Inventory management (46%), order picking, order waving/releasing, and coordinating manufacturing and supplier scheduling were reported to be in greatest need of improvement. (Figure 10)

FIGURE 10

Aspects of fulfillment operations needing improvement

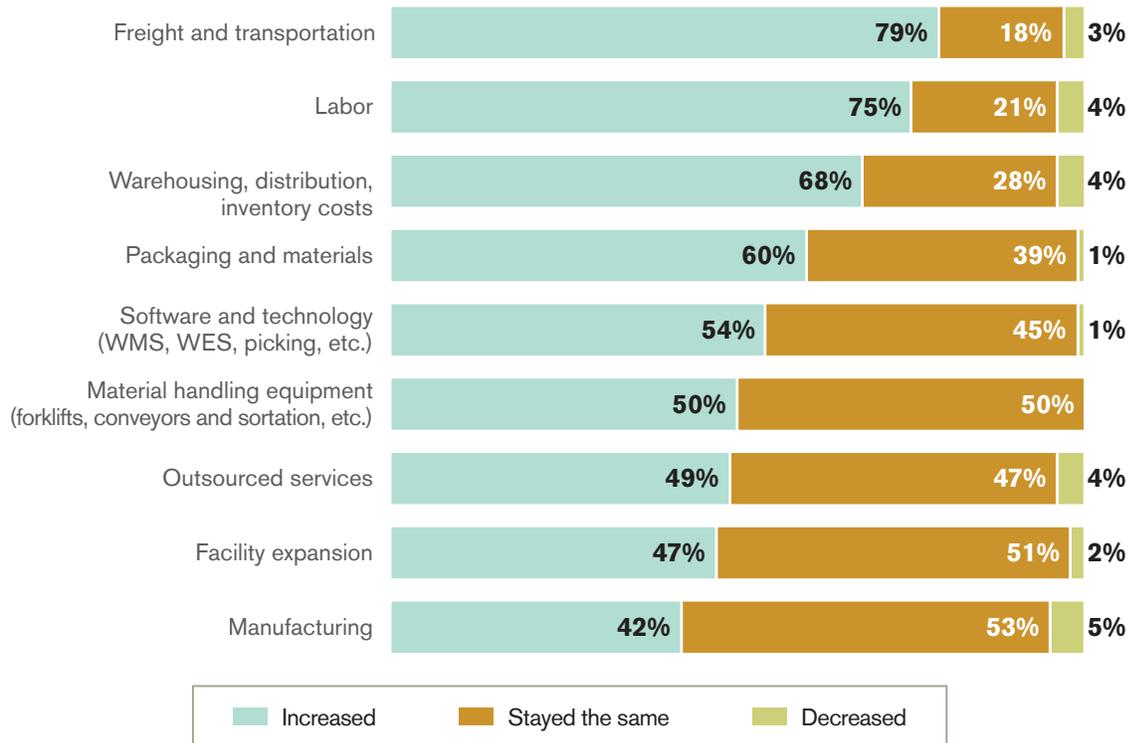


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Over the last two years, the costs of fulfilling orders have risen significantly. While organizations are experiencing the pains of rising expenses across most aspects of their fulfillment operations, freight, labor and costs related to inventory management and warehouse capacity have risen the most, and are the primary causes for increased overhead. (Figure 11)

FIGURE 11

Areas in which fulfillment costs have changed

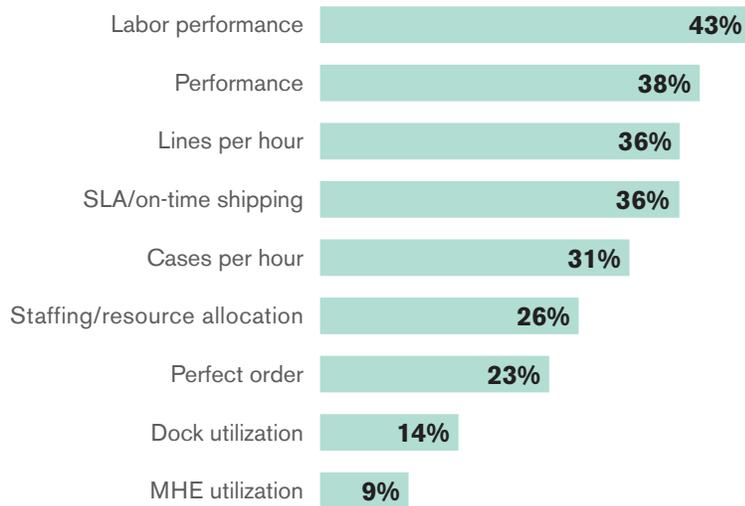


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Operational metrics are critical to help better control order processing costs and understand fulfillment process efficacies. Among those processes organizations most commonly tracked include: labor performance (43%), overall operational performance, productivity benchmarks (such as lines picked/packed per worker, cases per hour) and ensuring the fulfillment of Service Level Agreements. (Figure 12)

FIGURE 12

Order tracking metrics being used



Even when analyzing productivity for key operational tasks, many organizations remain slow to automate. Workforce management is a prime example. In this survey, managers expressed the criticality of controlling labor and freight costs, and these are the areas in which costs are increasing most rapidly. Yet, fewer than one in 10 companies has automated labor management processes. Furthermore, nearly one out of five assert they have no plans to implement labor management technology. Order management, invoicing and order processing are the functions that are typically automated, if not fully, at least to some degree. (Figure 13)

This incongruity between the need to address rising labor costs and low uptake plans for labor management might be tied to respondents' understanding of traditional labor management systems (LMS). While useful and proven in many DCs, LMS mainly serves as a yardstick measuring worker productivity engineering standards or other metrics. LMS is evolving, but historically, it hasn't been applied to dynamic decision making regarding workforce allocation, such as spotting an emerging bottleneck in a zone or reassigning labor to avoid bottlenecks. This is where WES software, with its ability to release work with near real-time knowledge of capacity, delivery requirements, congestion and labor status issues, can help with workforce productivity.

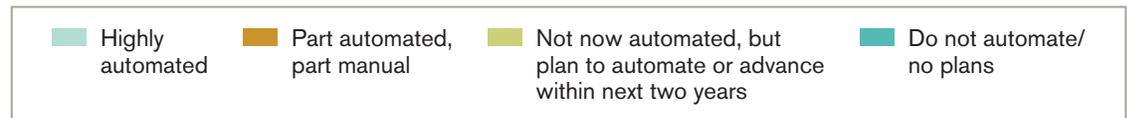
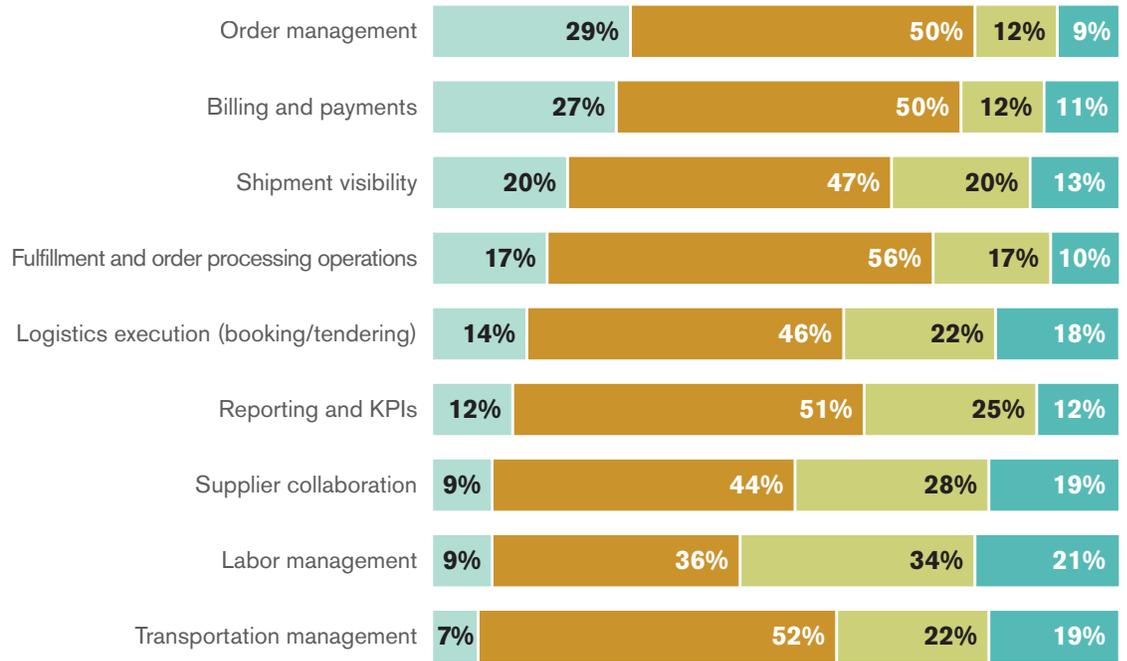
To some extent, the survey indicates the industry is still learning the intricacies of the WES concept and the way it ensures a level pace of work and smart, tactical decisions for labor

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allocation. At the same time, the survey shows growing interest in WES, in that while only 6% of respondents use it today, over the next two years, nearly 17% will evaluate, purchase or upgrade WES. Additionally, the two-year outlook plans for WCS and “software that enable new picking solutions” also are fairly strong, which are functions that can be considered part of the WES footprint.

FIGURE 13

Level of automation of supply chain tasks



As further evidence that some businesses lag in upgrading their supply chain technology, only one out of three (37%) have either replaced their legacy systems within the last two years or are planning to replace outdated equipment in the upcoming months. However, those who are moving forward recognize the need to transition to modern software solutions, reduce the number of systems they are operating, and better optimize their operations for e-commerce performance.

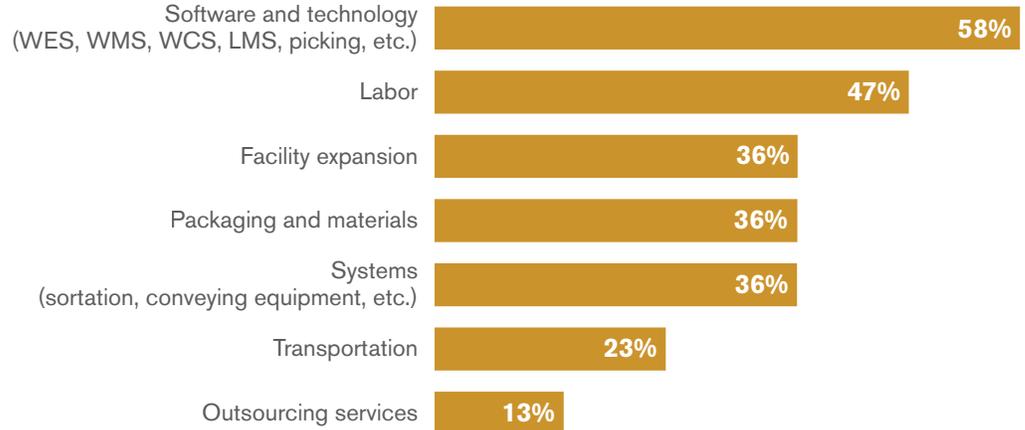
While many organizations still lack end-to-end automation across their fulfillment operations, the majority of companies in our survey expect to increase investments in software and technology (58%), such as WMS, WCS and WES systems. Labor management facility expansion,

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packaging equipment and materials, and implementing or upgrading automated materials handling systems are also prime areas for upgrades. (Figure 14)

FIGURE 14

Areas in which companies are/will be investing



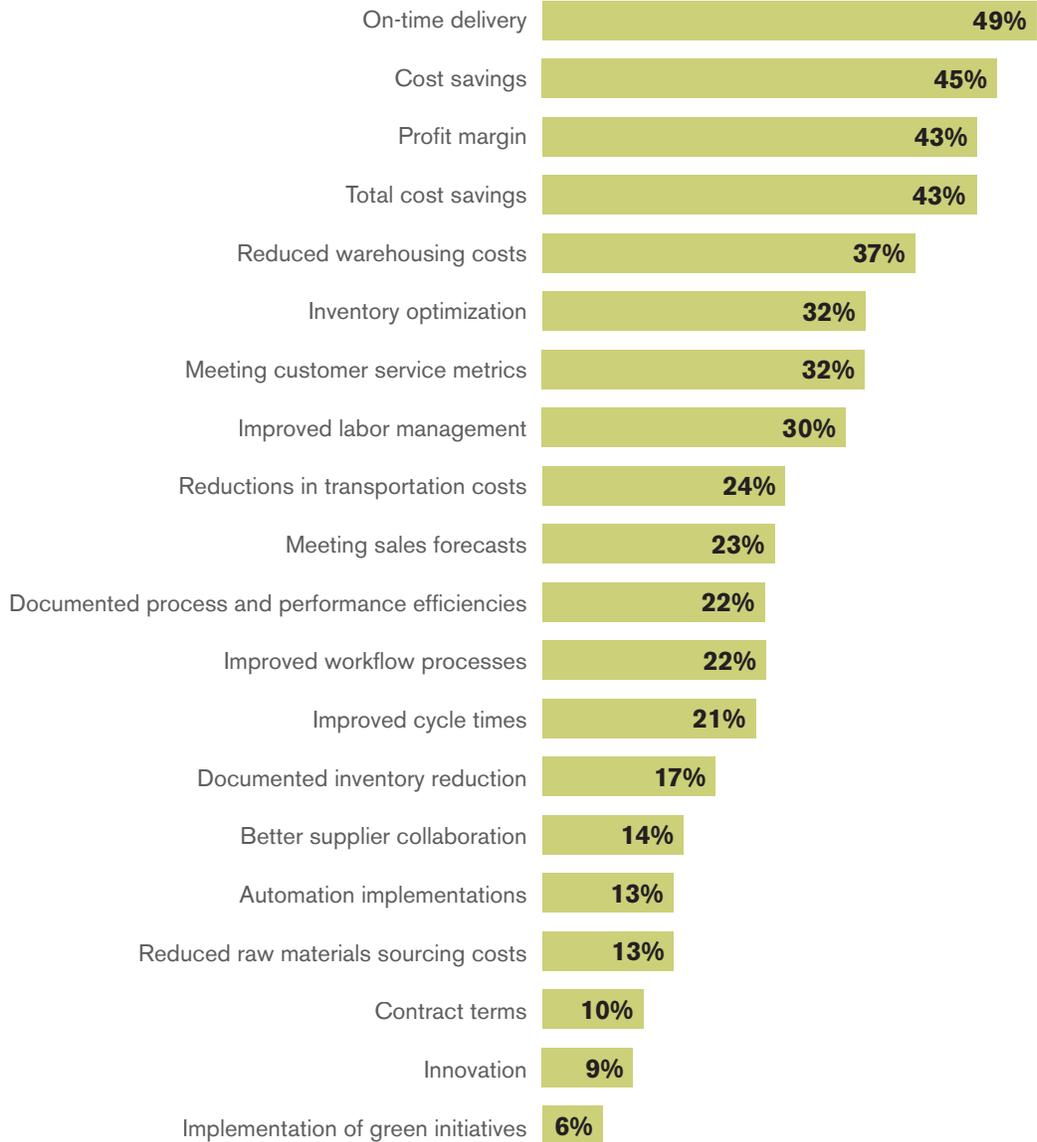
Interestingly, slightly more than one-third of those surveyed are not gauging the return on their automated order fulfillment investments. This seems to be consistent with other findings in our survey organizations are slow to embrace metrics for tracking fulfillment operations performance.

While numerous key performance indicators (KPIs) are being leveraged to gauge fulfillment operations performance goals, no one indicator is ubiquitous. The survey also questioned broader areas of improvement in the context of performance objectives. Top KPI areas include on-time delivery, cost savings, profit margin, and inventory and customer service metrics. Interestingly, objectives or advancements such as innovation, process improvements, supplier collaboration, and adoption of automated systems are tracked by only a few. And, improved labor management, a top concern for many fulfillment operations managers, is a performance indicator used by less than one out of three (30%) companies. (Figure 15)

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FIGURE 15

Key performance indicators (KPIs) use to gauge performance objectives



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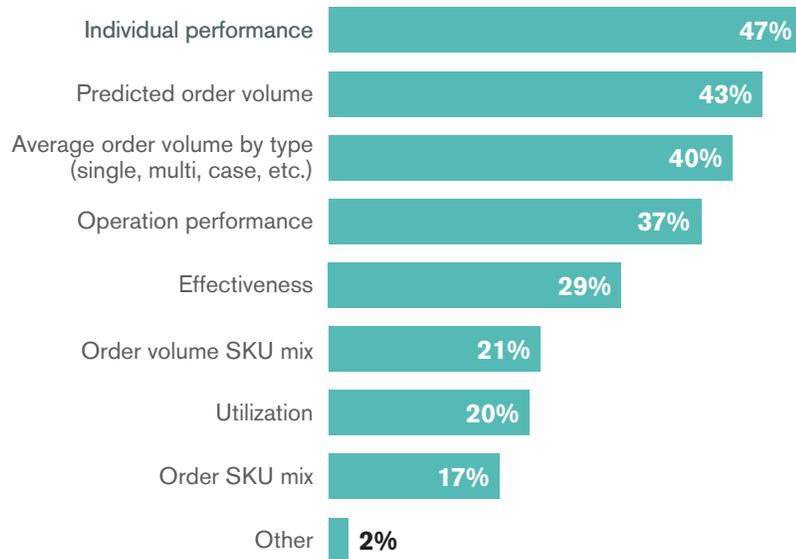
Labor Pains

A common theme in these research findings centers relates to the challenges that managers face trying to efficiently schedule workforce allocations and better control labor costs.

Most managers typically schedule on a weekly cycle and base labor decisions on criteria such as an individual's performance, order volume estimates and order type forecasts, and operational performance. (Figure 16)

FIGURE 16

Metrics used in the labor planning process



Overtime and related costs are primary labor management pain points. In particular, order picking jobs are not only the main reason for overtime but also are the costliest assignments. Nearly one-half of all organizations spend the most on order picking procedures. Shipping and receiving additionally necessitate managers to employ overtime.

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CONCLUSIONS

Overall, this research yielded many interesting findings, especially pertaining to the need for greater automation and software-driven efficiencies:

- 44% adding automation to better handle growth pressures;
- 58% who say they'll invest in software such WMS, warehouse control systems or picking technologies; and
- Growing interest in WES solutions, moving from only 6% who use it today to nearly 17% who will evaluate or purchase WES in the coming two years.

There is clearly room for improvement when it comes to systems or technologies that help manage labor and freight costs, two of the top areas in which respondents say fulfillment costs have increased. Interestingly, there appears to be no single solution to the many challenges involved in e-commerce fulfillment. Top areas for improvement span inventory management, picking solutions, order releasing/waving, as well as other areas which can be addressed by warehouse management and warehouse execution solutions. WES, with its ability to release orders in a way that synchronizes automation and labor resources to ensure a level flow of work in fulfilling orders in DCs, merits consideration as a solution for addressing some of the key challenges found in the survey. The findings do suggest that by assessing top pain points and mapping them back to capabilities that need improvement, companies can make inroads on these complex fulfillment challenges.

METHODOLOGY

This research was conducted by **Peerless Research Group** on behalf of *Logistics Management* for **Honeywell Intelligent**. This study was executed in February/March 2018, and was administered over the internet among subscribers to *Modern Materials Handling* magazine.

Respondents were prequalified for being involved in decisions related to their company's warehouse/DC operations.

The findings are based on information collected from 171 materials handling executives employed in the manufacturing, retail and wholesale sectors. A range of manufacturing industries are represented and include food and beverage, automotive and parts, industrial machinery and pharmaceuticals. Companies of all sizes are also represented in the study; 43% are employed in companies reporting less than \$100 million in annual revenues, 38% are with companies earning between \$100 million and \$1 billion annually, and 20% work at companies having \$1 billion or more in annual revenues.

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About Honeywell Intelligent[®]

At Honeywell Intelligent, we understand that retailers share common challenges: shorter delivery windows and cycle times; more demanding service level agreements (SLAs); and an ever-increasing variety of SKUs, order profiles and seasonal demands. We also recognize that each fulfillment operation has very unique requirements, infrastructures and fulfillment workflows. Momentum™ provides the necessary flexibility to allow you to configure functionalities that align with your operational demands.

Momentum warehouse execution system (WES) by Honeywell Intelligent is a feature-rich software platform built to address the escalating complexities in diverse and ever-changing distribution operations. As the industry's only clean-sheet approach to WES software, Momentum incorporates multiple warehouse functionalities into a common code base. Through seamless integration of sensors, controls, automation and orders, Momentum oversees DC activities to give you real-time order fulfillment status and greater visibility to in-process work. In other words, Momentum is warehouse execution — simplified.

As labor shortages, costs and productivity challenges persist, many operators are introducing increasing levels of automation to meet online order volumes. Regardless of where you sit on the spectrum of automation, Momentum is designed to remove the complexities of order fulfillment and match the speed of today's commerce demands while offering exceptional configurability, stability and extensibility to help you run your operations the way you know best.

Momentum capabilities include:

- Dynamic space allocation via automated storage and retrieval system (AS/RS system) and shuttle
- Intelligent order release based on capacity, delivery time, congestion and labor
- Just-in-time put wall allocation and order consolidation
- High-density pick and put via location sizing and configuration
- Automated sort and shuttle order consolidation
- Goods-to-operator workstations (multipurpose tasks, work prioritization and dynamic routing)

Momentum can help you achieve:

- Maximum fulfillment flexibility
- Improved equipment and space utilization
- Increased throughput and labor productivity
- On-time shipments with improved order accuracy
- Reduced labor costs and requirements
- Shortened cycle times and faster deliveries

Honeywell Intelligent enables order fulfillment operations for more than 60 of the top 100 global retailers and half of the top 100 internet retailers through a broad portfolio of automation equipment, software, service and support. The business helps customers gain a competitive edge and optimize operational performance through increased flexibility, efficiency and accuracy.

To learn more:

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