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Technology's role in improving the **efficiency of warehouse logistics** and **order fulfillment accuracy**



SUPPLYCHAIN
MANAGEMENT REVIEW



Table of Contents

Technology's role in improving the efficiency of warehouse logistics and order fulfillment accuracy 4

Omni-channel wholesale distribution is transforming business operation priorities in front of our eyes. Here's how firms are successfully applying technology in their efforts to attain best-in-class status and stay ahead of the game.

Retail without boundaries 8

Omni-channel retailing is upending the way consumers shop and interact with their favorite brands. In response, retailers must redesign their supply chains to meet growing customer expectations in a new retail world without boundaries.

Cisco's warehouse of the future 16

Cisco says the warehouse of the future will focus on automation and integration across the supply chain. That doesn't necessarily mean automated materials handling.

Distributors seek edge 22

Technology investments deliver returns for small and mid-sized companies.

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Welcome

It's sink or swim

The operating landscape for distributors has certainly "shifted." In fact, many in the industry say that the evolution of omni-channel fulfillment has flipped the distribution model on its head. Changing B2B and B2C buying habits are forcing once reticent distributors to deeply examine how they need to apply technology to not only stay competitive, but to keep the lights on.

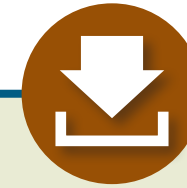


Recent research from Aberdeen certainly helps tell the tale. According to the firm, the top 20 percent of distributors have 97 percent inventory accuracy and 98 percent complete and on-time shipments—and boast a 19 percent increase in profit margin. On the other end, the bottom 30 percent of performers have 86 percent inventory accuracy, 87 percent complete and on-time shipments, and 2 percent *decreases* in profit margins.

No matter where you feel your organization falls on this scale, the need to improve your operations during this challenging time is paramount. With this in mind, the editorial staff of *Supply Chain Management Review* has compiled this special edition to help distribution professionals better understand the growing importance of improving warehouse efficiencies and order-fulfillment accuracy in today's omni-channel environment.

Michael A. Levans
Group Editorial Director
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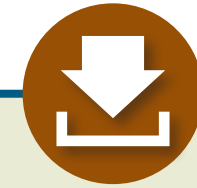
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Business management systems must be capable of evolving at the same pace as the sector's companies, providing solutions to problems and assisting them with new challenges they face.



Anisha Virani | President
Sunblest Commodities



Technology's role in improving the efficiency of warehouse logistics and order fulfillment accuracy

Omni-channel wholesale distribution is transforming business operation priorities in front of our eyes. Here's how firms are successfully applying technology in their efforts to attain best-in-class status and stay ahead of the game.

By Bridget McCrea,
Contributing Editor

In today's competitive, fast-paced distribution environment, earning the title "best in class" isn't always an easy goal to achieve. In fact, according to research firm Aberdeen, the top 20 percent of distributors have 97 percent inventory accuracy and 98 percent complete and on-time shipments. The same category of companies also boasts a 19 percent increase in profit margin over the prior two years and a 40 percent decrease in time-to-decision over the past year.

At the other end of the spectrum lies a group of distributors whose numbers are decidedly less impressive. According to Aberdeen, the "laggards," or bottom 30 percent of performers, have 86 percent inventory accuracy, 87 percent complete and on-time shipments, 2 percent *decrease* in profit margins, and an 11 percent *decrease* in time-to-decision.

"This is a very telling market statistic and a good gauge for distributors that

want to know exactly which category they fall into. Are you at the top of your game or are you lagging behind your competitors?" asks Michelle Woolfolk, director of product marketing at Sage. "If you're in the latter bucket, then it's time to start looking for technology solutions that can help you be more competitive while also aligning your business with some or all of these best-in-class practices."

Over the next few pages, we'll explore the growing importance of improving warehouse efficiencies and order fulfillment accuracy in today's omni-channel distribution environment, discuss the role that technology plays in helping companies achieve their efficiency goals, and hear how several firms are successfully applying technology in their efforts to attain best-in-class status.

Blurring the market boundaries

With market boundaries blurring and both business-to-business (B2B) and

business-to-consumer (B2C) requirements converging, a growing number of distributors and manufacturers are selling direct to consumers.

Additionally, even in the B2B environment, businesses are expected to offer the same experience that consumers have come to count on when buying goods offline and online. As a result of these trends, distributors are increasingly dealing with a variety of fulfillment models that are being driven by customers that are looking for quicker delivery and consistent service across any channel.

In light of these challenges, distributors are grappling with issues like inconsistent user experiences, differing views of customers across devices and channels, increased data and integration needs, and new process complexities. Add in the fact that many of these companies are using siloed, proprietary technology systems that haven't been upgraded since Y2K, and the new demands of the omni-channel environment become that much more difficult to meet.

"Omni-channel wholesale distribution is transforming business operation priorities, from inbound source-to-pay to outbound order to fulfill/deliver," says Woolfolk. "For wholesale distributors supporting retail operations, new fulfillment models being driven by Amazon—like same-day or next-day fulfillment—require synchronization



aligning inventory forecasting with inventory management in the warehouse and pick, pack, and ship. The bottom line is that orders have to be on-time and correct in this fast-paced, quick-turnaround environment."

Integrating new technology

Getting orders on time and correct in a business world where the best-in-class distributors achieve this goal nearly 100 percent of the time isn't easy.

And while technology plays a critical role in helping distributors improve their warehouse efficiencies and order fulfillment accuracy, many companies continue to grapple with the basics of applying technology within their operations. According to recent Sage

research, distributors identify their top five technology challenges as:

1. Integrating new technology with legacy systems to have a single view of the business.
2. Using mobile technology to make sales and customer service more efficient.
3. Optimizing inventory management and demand forecasting.
4. Leveraging customer relationship management to manage new sales opportunities.
5. Rapidly analyzing/connecting business insights to drive decision making.

Kelly Hummel, CEO of management consulting firm AXIS Integrated Solutions, says most of these challenges are being driven by the bigger, better, and faster delivery promises being



made by huge e-tailers like Amazon, whose Prime service is based on a two-day, free-delivery guarantee.

“Distributors that want to remain competitive, and that aren’t selling on Amazon Prime, have to be able to meet that free, two-day shipping delivery anywhere in the United States,” says Hummel. “That’s making an impact on everyone in the ecosystem right now.”

At the B2B distribution level, Prime translates into being able to run your own trucks and routes on a two-day (or faster) schedule. “That’s just the programmed anticipation based on Internet adoption and the way in which delivery times have sped up over the last 10 years,” says Hummel, who sees enterprise resource planning (ERP) systems that include integrated accounting systems, warehouse management systems (WMS), and electronic data interchange (EDI) systems as viable technology selections for distributors that want to achieve best-in-class status within their industries.

“Even smaller suppliers are being forced to become extremely sophisticated to meet the challenges of faster, more accurate shipping,” says Hummel.

Improving efficiencies, gaining visibility

Best-in-class distributors recognize that investing in technology to address their challenges makes a difference—and they’re seeing big results. Distributors are turning to technology to help

increase business-wide visibility, improve efficiency, and optimize processes for growth.

Whether it’s increasing visibility around customers, products, and operations to make smarter decisions, optimizing warehouse and sales teams with mobile technology, or integrating multiple systems so there’s one complete view of business, these capabilities help provide a strong and sustainable foundation for business growth—all of which are enabled by robust, integrated business management solutions.

Power Distributing, a distributor of premium energy drinks, has been using Sage solutions for nearly a decade, migrating to more powerful solutions to meet its growing needs. When the company wanted a flexible platform to integrate with its new route management software, it sought a solution with open architecture and comprehensive development tools.

“We are a numbers-driven company,” says Fran Taglia, the distributor’s COO. “We want accurate metrics surrounding all of our business data.” The company processes more than 6,000 receivable invoices per week, and relies on its technology platform to help it dive deeply into sales, purchasing, and inventory data.

“We need to react to changing conditions rapidly, and the data we get from Sage X3 helps us do that,” says Taglia, noting that Power Distributing’s average turnaround

time for a truck has dropped from 45 minutes to 15 minutes as a result of its technology platform. “The software’s flexibility and support for our workflows have made the process much more efficient. Our sales reps have more time out there selling.”

This is just one example of how distributors can effectively leverage technology to improve warehouse efficiency, enhance order fulfillment accuracy, and work smarter, better, and faster in today’s demanding business environment.

To companies looking to emulate Power Distributing’s achievements in this area, Woolfolk says that a good first step is to simply assess your company’s current needs by asking yourself these questions:

- Where do we have insight, automation, and integration today that help us manage inventory and order/warehouse fulfillment processes?
- Where are the gaps in these functions and processes?
- What are those business processes that are creating inefficiencies for our organization, and will automation solve these problems?
- Are we integrating into our ERP or financial management system?
- Do we have the data that we need to provide the insight?
- What is the quality of that data?
- What business insight or business

questions do we need answered that we can’t answer today?

“Once you have the answers to these questions,” says Woolfolk, “you can start to determine the resources that you need to help implement a solution.”

Boost sales, gain efficiencies

For the last 25 years, St. Joseph Paper and Packaging of South Bend, Ind., has been distributing paper products, bubble wrap, and pallet strapping supplies to a wide range of companies. The company prides itself on providing customers with the total package—quality products backed by the best service, experience, and dependability in the industry.

Rewind about 10 years and St. Joseph Paper and Packaging was using a combination of manual and proprietary systems to manage a 35,000-square-foot warehouse that today is home to more than 8,500 different SKUs.

“We needed a way to consolidate our warehouse management functions under one system,” says John Giczewski, purchasing manager. “As a company that prides itself in being at the ‘front of the pack,’ we knew this type of platform would help us save time and create efficiencies without having to add staff.”

After reviewing the options that were on the market at the time, the distributor implemented Sage 100, selecting the solution primarily for its strong inventory management and warehouse-

“We want accurate metrics surrounding all of our business data. The company processes more than 6,000 receivable invoices per week and relies on its technology platform to help it dive deeply into sales, purchasing, and inventory data.”

—Fran Taglia, COO, Power Distributing

ing functionality. “Keeping the right mix of products on hand without costly overstocking is key, and Sage 100 helps us do that,” says Giczewski. “It’s quick and responsive software that provides us with a great deal of insight and control over our inventory.”

The company uses its ERP as its financial, inventory management, and warehousing solution. For example, the company can easily query current product costs and perform strategic long-term analyses.

Other reports help the company make accurate sales forecasts and more informed and strategic purchasing decisions by bringing together metrics including historical sales, vendor lead times, current stock on hand and on order, and seasonal sales trends. Having easy access to this information helps the distributor follow its margins over time, spot trends, and take a proactive approach to maintaining and growing its profitability.

More recently, the company implemented Sage Mobile Sales as a way to tie its sales reps into the solution and

keep them empowered and informed. “In the year since we implemented Sage Mobile Sales, our sales are up by 16 percent,” says Giczewski. St. Joseph Paper and Packaging also uses Sage Fixed Assets to track and manage its assets throughout their lifecycles.

To other distributors that may be struggling under the pressures of industry shifts and more demanding customers, Giczewski says the best approach is to test any technology system *before* committing to it. Consider whether the out-of-the-box version will require extensive customizations (an expensive proposition in some cases) or if it’s ready to use as-is.

“In many cases, the solution may look good on paper, but once you have it in place, the amount of backend work required could create complications,” says Giczewski. “Do your homework on the front end, look at the vendors carefully, and consider what has to go into the conversion and/or implementation process before you buy.”

—Bridget McCrea, Contributing Editor

Retail without Boundaries

Omni-channel retailing is upending the way consumers shop and interact with their favorite brands. In response, retailers must redesign their supply chains to meet growing customer expectations in a new retail world without boundaries.

Supply chain innovation comes in two iterations: reactive and proactive. Reactive innovation is a response to change, including change that an organization didn't see coming. Proactive innovation is a catalyst for change. When a leading organization gains a competitive advantage through proactive innovation, the rest of the market has to react just to keep pace.

Both types of innovation are on display in the retail supply chain as the industry evolves from single channel to multi-channel to omni-channel retailing.

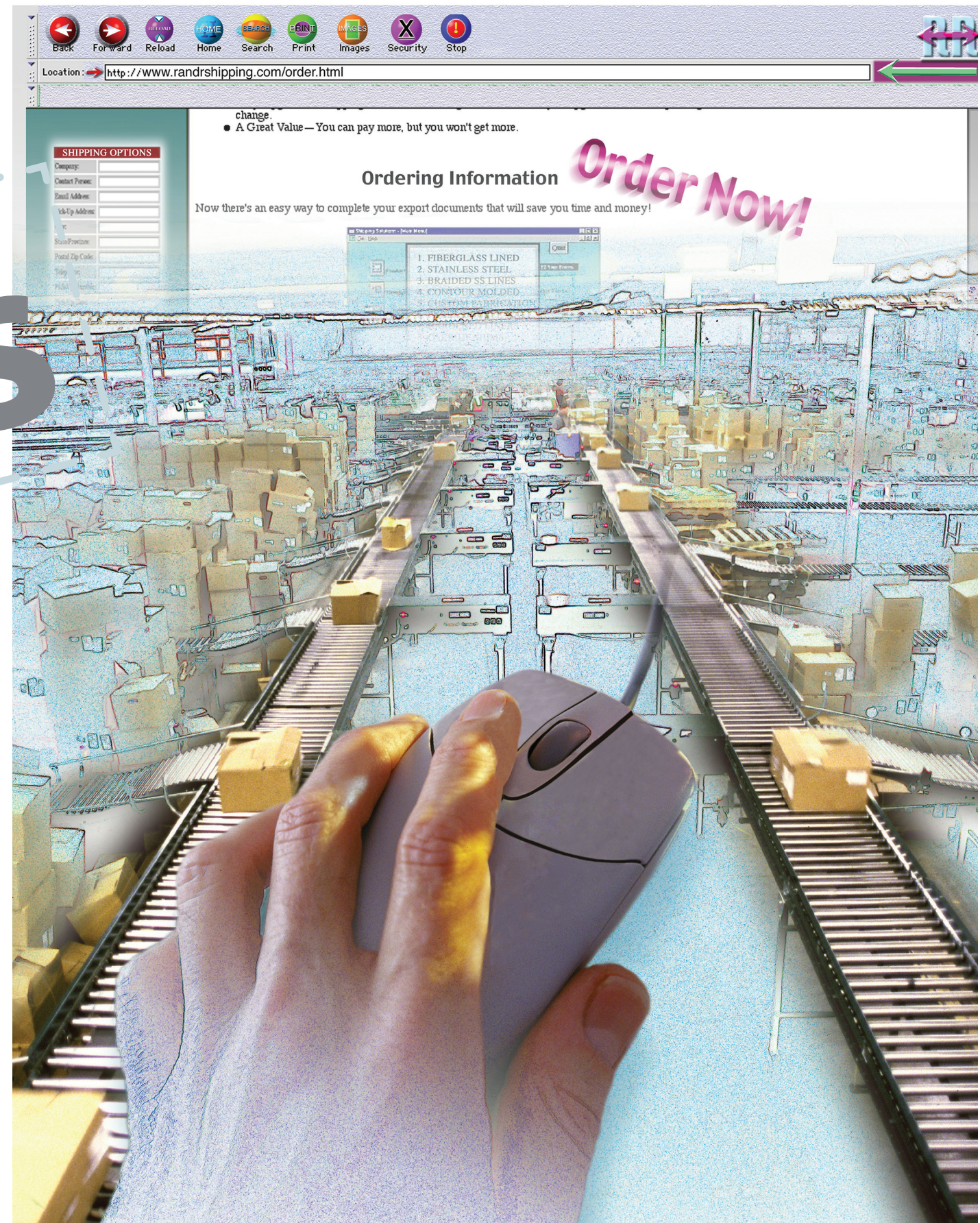
The catalyst for this evolution is Amazon Prime. Back in 2005, the online retailer announced free two-day shipping on qualified items. Designed to enhance loyalty and fuel top line sales growth, the Amazon Prime program has had a huge impact on Amazon's success in recent years.

The impact has rippled through the retail industry. Brick-and-mortar retailers, in particular, have scrambled to devise strategies to counter free shipping. In response, they are deploying reactive innovation solutions that leverage one of their best assets—their stores. This coupled with the growth of mobile commerce and social shopping has seen the emergence of what many are calling omni-channel retailing.

In many respects, this new approach represents a kind of boundaryless retail, where the silos between brick-and-mortar, catalog, and Internet retailers have disappeared—at least

By Randy Strang

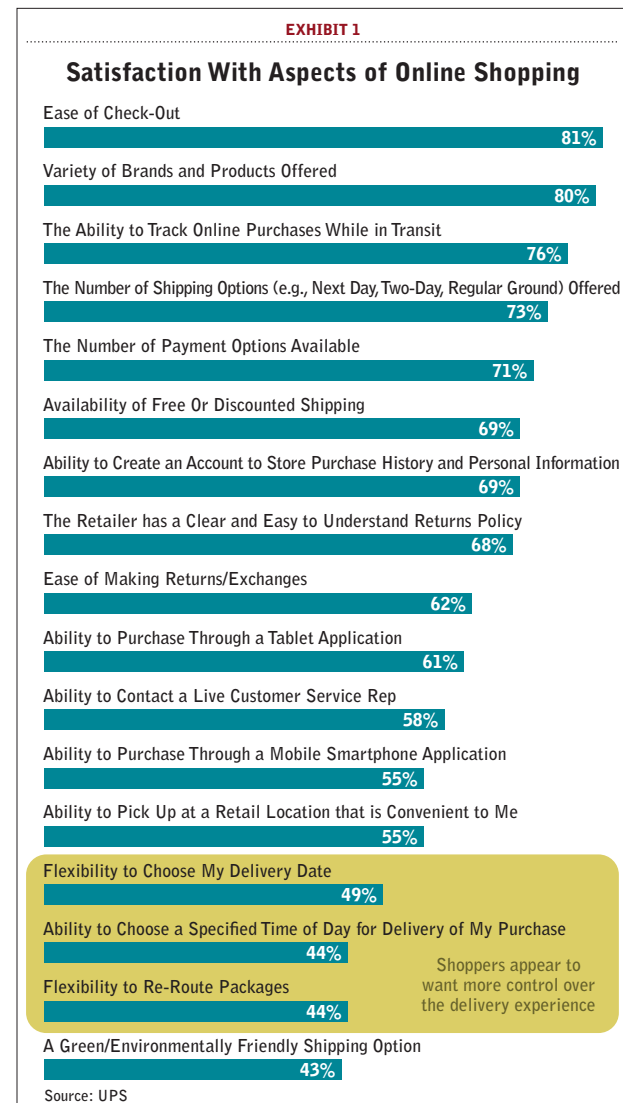
Randy Strang is vice president of Customer Solutions for the Retail Industry team at UPS. He leads a group of logistics professionals who design supply chain solutions for global retailers. He can be reached at rstrang@ups.com. For more information, visit www.ups.com.



as far as the consumer is concerned. Today's shoppers are empowered by their ability to instantly connect to a global marketplace where thousands of sellers are offering an abundance of items at competitive prices. Online shoppers have access to price comparisons and customer reviews and opinions on any product they want to purchase and any retailer from whom they want to purchase. What's more, they can research products on social media, videos, and consumer blogs.

The growth in this segment offers opportunities and pitfalls for retailers. To survive and thrive in an omni-channel world, they must adapt their supply chains, order management, and order fulfillment processes to this sea change.

This article will explore the catalysts behind the movement toward omni-channel retailing; the key consumer behaviors that will affect how the strategy is



deployed; and what retailers are experiencing as they redesign their supply chain operations.

Taking the pulse of the online shopper

Retail analysts predict there will be more than a billion online shoppers who will spend nearly \$1.3 trillion this year on e-commerce purchases—18 percent more than 2012. Given UPS's role in the last mile of the omni-channel supply chain, we wanted to understand the pulse of the online shopper—our retail customers' customer—and the purchasing decisions that affect order fulfillment expectations and processes. Last February, working with comScore, a leading digital analytics firm, we asked 3,000 online shoppers which factors led them to shop more on their computers, smartphones, or tablets; abandon their shopping carts; and to recommend particular retailers to their friends. The result is the *2013 UPS Pulse of the Online Shopper: A Customer Experience Study*.

The most important findings: Consumers want more choices when it comes to shopping online; more control over when their purchases will be delivered; and a convenient returns process. They're also using social media to shop for the best deals and expect more shipping options from e-tailers. Each of these has an impact on the retail supply chain.

One of the first questions asked consumers which factors compel them to shop with an online retailer. Many respondents said they expect a streamlined process across multiple channels:

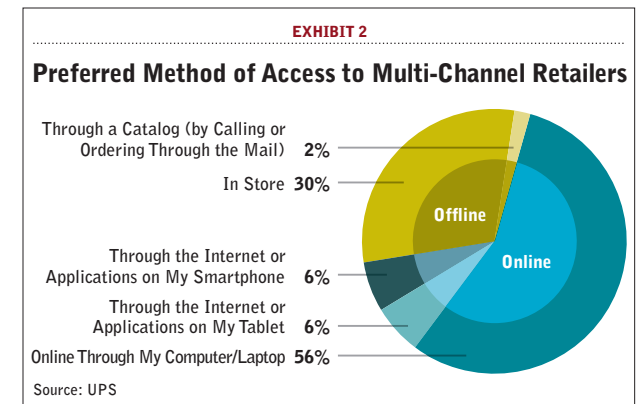
- 62 percent want the ability to purchase online and make returns in-store;
- 47 percent want a coupon or promotion sent to their smartphone when they are in-store or nearby; and
- 44 percent want the ability to buy online and pick up at the store.

Although 83 percent of the respondents said they were satisfied with their online shopping experience, there is room for improvement. Ease of checkout, more variety of brands/products offered, and the ability to track online purchases while in-transit were most often identified as areas for improvement. Online shoppers said they want the ability to choose their preferred delivery date, time of day for delivery, and they want options to reroute their inbound packages. They also value free shipping. (See Exhibit 1.)

The study confirmed a recent online omni-channel shopping trend: Consumers want to shop *anywhere at any time*. In fact, Exhibit 2 shows that 68 percent of online shoppers prefer to shop with multi-channel retailers online instead of shopping in a store, from a catalog, or by the mail. Retailers using enhanced websites and

advanced mobile apps will have a competitive advantage.

When it comes to the check-out process, retailers should pay attention to cart abandonment as it continues to rise. In 2013, 88 percent of online consumers abandoned a shopping cart compared to 81 percent in 2012. Based on our study, half of consumers said they want to see estimated shipping costs and delivery dates early



in the check-out process—the second most important option after free shipping. Looking at the impact of cart abandonment due to an estimated delivery date, 85 percent of the respondents said it was because no date was given or it was longer than six days.

Online shoppers also value a hassle-free returns policy, especially repeat customers: 82 percent of consumers said they would complete the purchase if they could return the item to a store or have free return shipping; 67 percent said they would shop more with that retailer; and 64 percent would recommend the retailer to a friend.

Social channels continue to change the way online consumers shop. Not surprisingly, 84 percent said they use at least one social media site. Among Facebook users—the most popular channel—60 percent “like” a brand to receive an incentive or promotion.

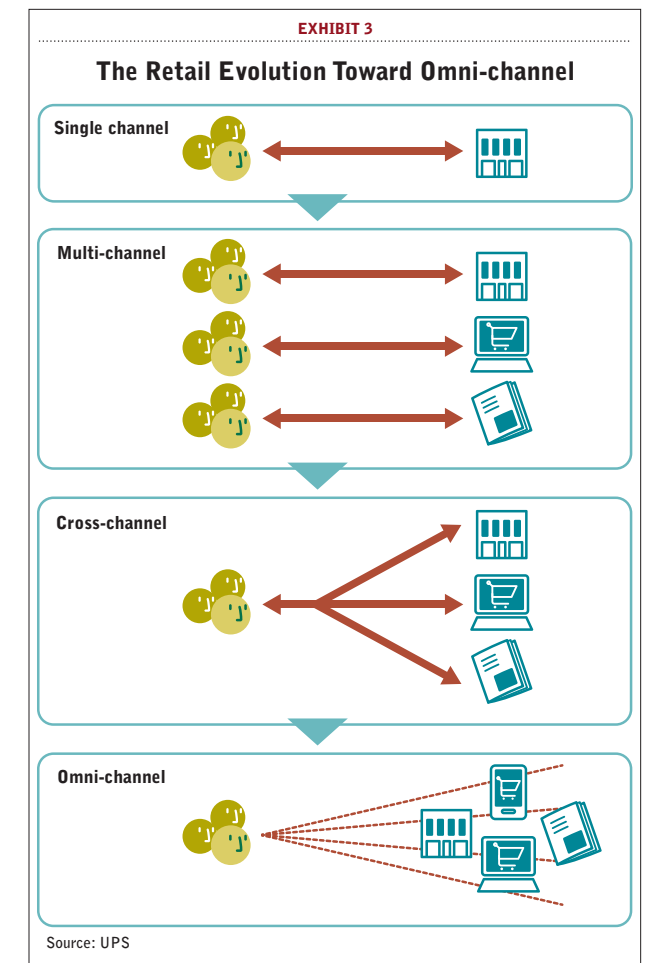
Another trend retailers are considering is same-day delivery. Like free shipping, this is a proactive supply chain innovation being driven by Amazon, eBay, and even Google. Other retailers, such as Walmart, have announced they are investigating same-day delivery options. Through our Strategic Enterprise Fund, UPS became an investor in Shu!t!, a British start-up that connects retailers to local same-day courier companies. Online shoppers can receive packages within 90 minutes or choose a one hour window for delivery. GPS tracking allows consumers to track the progress of their orders on a mobile device. We are presently conducting research to see how much consumers are willing to pay for this new level of customer service.

The omni-channel evolution

The omni-channel strategy that many retailers are pursuing today is being driven by e-commerce growth and consumer habits and expectations like those identified in our study. These changes are driving the need for supply chain transformation.

This concept did not suddenly emerge. Rather, it is a continuum of trends that were initiated in the early 1990s as brick-and-mortar retailers that sold through a single channel began to expand their business by creating an online presence. Exhibit 3 shows the first phase that was called multi-channel retailing, which means a retailer was selling through more than one channel, which could include its own stores as well as sales to wholesalers, through catalogs, or online.

In the multi-channel model, there was often little in common between what was available in the store, in a catalog, or online. Each channel offered multiple independent touch points to the consumer—many times selling different items under separate brands. Just as often, orders were satisfied through separate supply



chains. Inventory for store replenishment and wholesale orders was managed from one distribution center while inventory for online and catalog orders was managed from another facility or a third-party logistics provider.

Multi-channel evolved into the cross-channel model, as retailers started offering common branding and messaging. However, they continued to operate in separate functional silos with various touch points to consumers.

Multi-channel and cross-channel retailing innovations were driven by retailers that were trying to expand their sales. The transition from cross-channel to

In an omni-channel world, retailers want to be able to satisfy demand from anywhere—a retail store, a distribution center, a third-party distributor, or drop-shipped from a manufacturer.



omni-channel retailing, on the other hand, is being driven by consumers. The increasing use of smartphones, tablets, and mobile applications in the United States, Asia, and Mexico has created online shoppers with an insatiable appetite for information. This omni-channel consumer is driving the desire for a seamless customer experience across all customer touch points. They want to buy from anywhere—in a store, on a laptop or PC, or from their phones and tablets; they want to pick it up from anywhere—in a store, at their place of work, at their home, or sent to a friend; and they want to return

it anywhere—to a store or back to a distribution point.

Moreover, in an omni-channel world, retailers want to be able to satisfy demand from anywhere—a retail store, a distribution center, a third-party distributor, or drop-shipped from a manufacturer; and they want the ability to have an order returned to where it can generate the most value on the next sale.

Crawl, walk, run, sprint

Providing such an omni-channel experience for consumers is a retailer's "nirvana." It is also difficult to attain. From our experience with scores of retailers, we have observed the best organizations don't move from single channel to omni-channel retailing overnight. Instead, they use a method that is common in the deployment of technology, which is crawl to walk, walk to run, and run to sprint.

Crawl. In the early stages of implementing an omni-channel strategy, many retailers continue to function in separate channels. In the crawl phase, online can't see what's in the store and the stores don't directly participate in what is being sold online or from the catalog. Marketing messages begin to align online with the stores and there are efforts to make sure the same or similar items are sold on both channels.

The process of synchronizing items can be difficult with various merchandising organizations, vendor relationships, and pack/display configurations. Some early forms of integration may be to sell online and deliver the item to the store for customer pick-up, or to allow customers to return items in-store that were purchased online. Some of the impacts to the supply chain include:

- Adjustments to the website and order management system are necessary to allow the consumer to select the desired store. The order management system must also have the correct "ship-to" address.
- Changes in outbound shipping processes to leverage the existing store replenishment network may be required. Retailers must pick the stores closest to the consumer to meet delivery expectations. Often, the online fulfillment and distribution centers are in different locations.
- Onsite pick-up in stores is challenging for sales associates. Work processes must be created to help associates separate merchandise for customer pickup from items sold in-store. The point of sales systems must also be configured.
- The point of sales system must also be altered to handle the return of items not currently in the

store inventory. Another process must be configured for items that cannot be resold. Often, online fulfillment centers can be leveraged to handle this inventory; however, transportation methods will need to be established.

Walk. The next phase of development involves shared inventory as items in distribution centers and stores are now visible and available to be sold anywhere. Stores also have visibility into the availability of items in other stores and can ship directly to a customer's home. Shared inventory visibility is the most critical—and perhaps the most difficult and expensive—step toward omni-channel retailing. Some of the capabilities include:

- **Buy online—ship from store:** The behind-the-scenes logic to make this happen is not simple.
- **Buy at store—ship from distribution center:** This option allows the store to "save the sale" instead of having the customer purchase from a competitor.
- **Buy at store—ship from (different) store:** This can also "save the sale" by allowing the store to locate an item at a different store and have it shipped to the customer from there.

As retailers enable these capabilities, they discover shipping from stores is not as efficient on a cost-per-item basis as shipping from the distribution center. We have provided several large retailers with the technology to improve and manage the productivity of in-store picking, packing, and shipping.

As retailers consider the added volume that will move to their stores from distribution centers or suppliers, and from stores to consumers, they often discover a need to re-evaluate their distribution network.

Another challenge is establishing the logic for routing orders to the stores for shipment. There are two primary strategies deployed:

- Reduce delivery time and/or costs for online orders by shipping from the nearest store to the consumer enabling next-day or second-day delivery.
- Optimize revenue by shipping merchandise sitting in stores and out-of-season to fulfill online demand. This will help reduce markdowns.

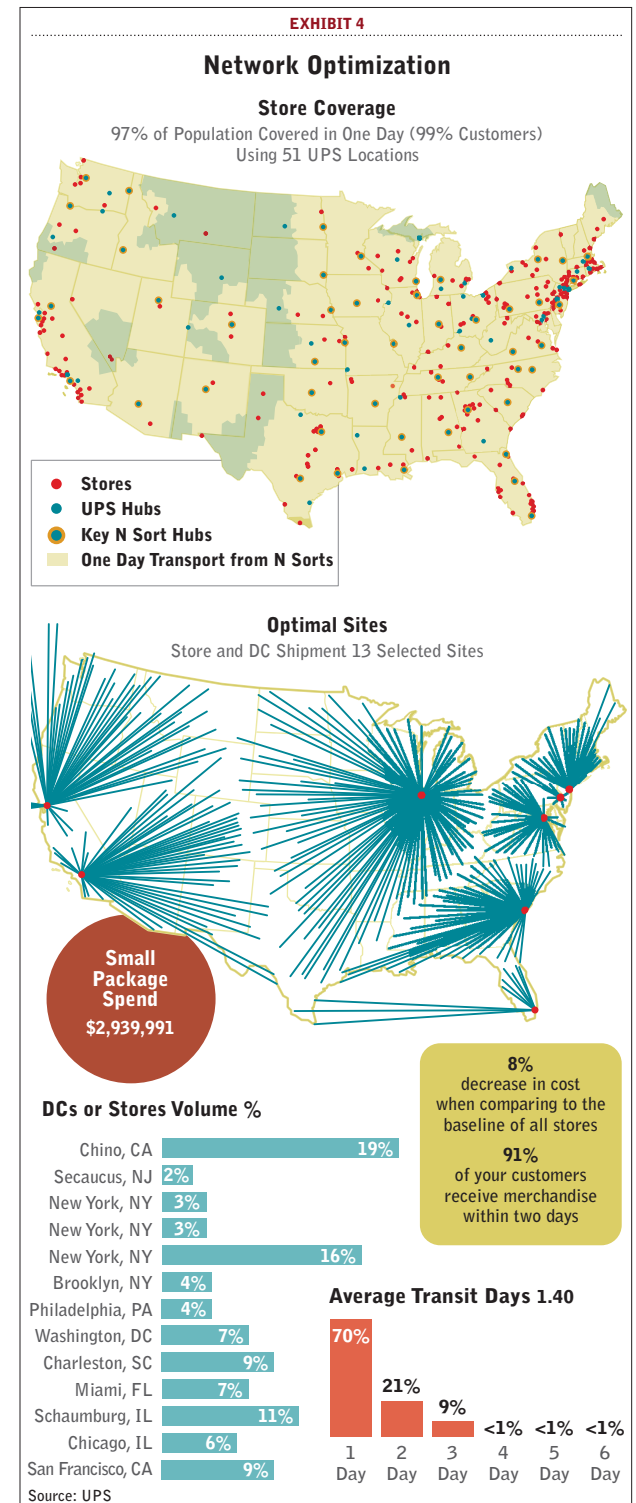
The deployment of either, or both, of these strategies can be tricky as the business models need to be coordinated between store operations, merchandising, and supply chain operations to make sure all group's priorities are considered.

Run. A retailer that reaches the run stage of omni-channel development has implemented universal inventory visibility. This strategy involves new ways to optimize this engine of growth:

- Create an integrated and seamless customer experience from the merchandise selection, store set-up, and catalog layout, to the web design.

experience from the merchandise selection, store set-up, and catalog layout, to the web design.

- Leverage information gathered both in-store and online to create an integrated view of each consumer.



In the most advanced deployments, retailers focus on improving the customer experience, increasing revenue, and optimizing supply chain operations.

The retailer will know which items the consumer purchased online, and consumers can view a history of items previously purchased. Online marketing will target ads to the consumers' preferences.

With a single view of a consumer's buying history, a

single integrated experience becomes possible to allow consumers to buy and return anywhere.

With broad visibility into inventory and consumer profiles, retailers can begin to offer more advanced options to compete with retailers.

• **Buy online—get delivered next day:** This service caters to consumers who shop online between 6 p.m. and 9 p.m. or “sit-back shoppers.”

• **Same day delivery:** For this service to be practical the merchandise needs to be near the customer.

Filling the increased volume of individual orders in omni-channel retailing is labor intensive and less efficient than conventional distribution models. This is especially true as retailers fulfill demand from retail stores. Retailers transitioning from the walk to run stages of omni-channel retailing are employing several best practices to optimize their processes.

Network optimization, for instance, determines the right number of hubs and stores for the network, where those should be located, and how inventory should be positioned to meet both cost and customer service expectations. We have worked with retailers that have realized 8 percent or better decreases in fulfillment costs while servicing more than 90 percent of their customers within two days as a result of network optimization. (See Exhibit 4.)

Process mapping and time studies are important tools for retailers including ship-from-store in their strategy. That's because store fulfillment is the least efficient and most labor intensive method of order fulfillment. Process mapping and time studies create a detailed chart of the steps required, or distance traveled, to fill orders in the store; how long the picking process takes; and how much time is spent walking. That can identify areas for process improvement. Retailers that have undertaken this process in their ship-from-store operations have identified as many as 180,000 hours of labor savings and \$2.5 million in annual cost savings (Exhibit 5). They are also able to re-deploy some labor used to pick orders back to the sales floor.

Finally, it's important to create a Balanced Score Card to measure activities more commonly associated with distribution centers, such as fill rates, on time shipping and units per hour in picking and packing operations. (Exhibit 6.) The point: Measurements are important to maintain the improvements designed into the process.

Sprint. In the most advanced deployments, retailers focus on improving the customer experience, increasing

EXHIBIT 5

Current-State Estimated Demand and Cost Annualized

	Units	Pick Hours	Pack Hours	Total Hours	Cost
Unplanned	793,603	37,611	32,659	70,270	\$983,781
Back Orders	706,097	33,464	29,058	62,522	\$875,305
ISP	976,610	46,285	40,190	86,474	\$1,210,644
Single-SKU	782,914	37,105	32,219	69,323	\$970,530
Air-to-Ground	166,733	7,902	6,862	14,763	\$206,688
Total	3,425,956	162,368	140,987	303,353	\$4,246,947

- Orders/Store: 349
- Hours/Store: 28.3 (3.5 FTE/Store)
- Cost per Unit: \$1.26

- Assumptions**
- Stores: 45
 - Pick Units/Hour: 21.1
 - Pack Units/Hour: 24.3
 - Labor Cost/Hours: \$14.00

Note: Process rates based on average of all three stores studied

Future-State Estimated Demand and Cost Annualized

	Units	Pick Hours	Pack Hours	Total Hours	Cost
Unplanned	793,603	12,400	16,397	28,796	\$366,505
Back Orders	706,097	11,033	14,589	25,622	\$326,092
ISP	976,610	15,259	20,177	35,437	\$451,022
Single-SKU	782,914	12,231	16,177	28,409	\$361,568
Air-to-Ground	166,733	2,605	3,445	6,050	\$77,001
Total	3,425,956	53,528	70,786	124,314	\$1,740,406

- Orders/Store: 349
- Hours/Store: 11.6 (1.5 FTE/Store)
- Cost per Unit: \$0.51

- Assumptions**
- Stores: 45
 - Pick Units/Hour: 64.0
 - Pack Units/Hour: 48.4
 - Labor Cost/Hours: \$14.00

Note: Process rates based on best demonstrated time studies less expected improvements

- Nearly **180,000 hours of labor savings** were identified
- Resulting in a **\$2.5M annual cost savings**
- Significant **revenue improvement** by redeploying labor to sales

Source: UPS

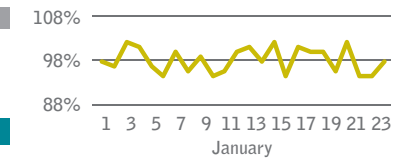
EXHIBIT 6

Metrics Recommendations: Sample Balanced Score Card Elements

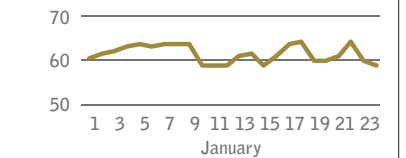
Customer Perspective

Element	Goal	Result	Weight	Score
Fill Rate	95%	99.5%	15%	15
Unplanned Inv. Acc.	90%	85.8%	15%	14
On Time Shipping	99%	93.5%	15%	14
Perspective Weight			45%	43

Fill Rate



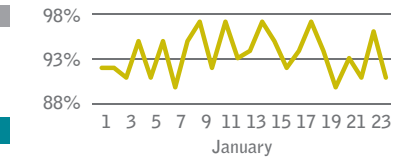
Pick UPH



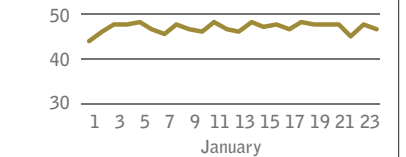
Financial Perspective

Element	Goal	Result	Weight	Score
Pick UPH	64.0	62.2	10%	9
Pack UPH	48.4	44.1	10%	9
Weekly Sales	\$55,000	51527.4	15%	14
Perspective Weight			35%	32

On Time Shipping



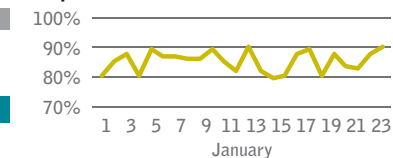
Pack UPH



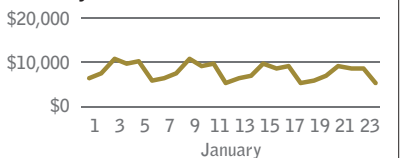
People and Learning Perspective

Element	Goal	Result	Weight	Score
On-the-Job Training	4.0	4	10%	10
Cycle Counts	12.0	11	10%	9
Perspective Weight			20%	19

Unplanned Inv. Acc.

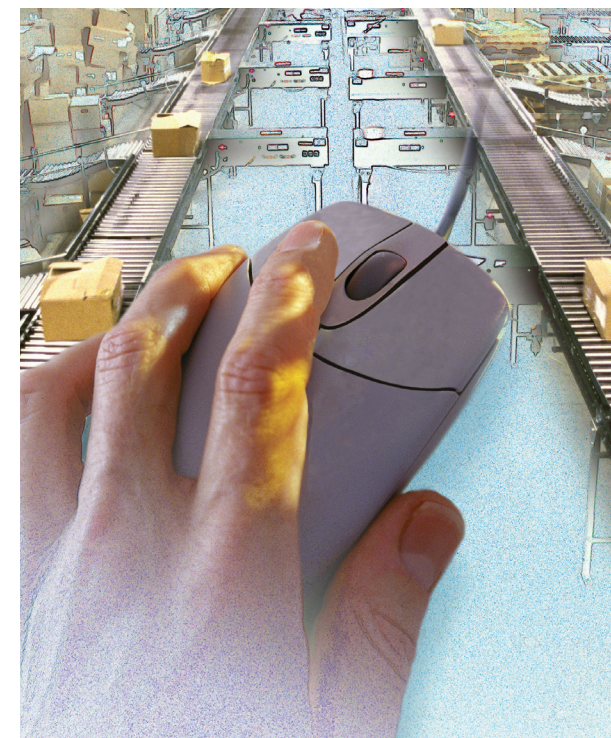


Weekly Sales



Balance Score Card Results: 94

Source: UPS



revenue, and optimizing supply chain operations. There are several strategies focused on inventory planning and store replenishment.

• Enhanced inventory and inbound supply planning processes incorporate the shipment from stores to

online consumers. This involves anticipating store traffic and online demand to accurately plan store and distribution center inventory levels. Careful consideration of the business rules for how online orders are allocated to stores is important in this process.

• Rapid store replenishment responds to fluctuations in-store or online demand. This ensures high-velocity and high-profit items are available.

Another emerging technology is geo-fencing. This technology creates a virtual perimeter around the store and knows when smartphones enter or leave the area. Once a consumer arrives, a promotional message can be sent to them based on their previous buying history.

Conclusion

In some ways omni-channel was the natural evolution from multi-channel retailing tearing down barriers between channels, synchronizing brand messages, and creating a seamless customer experience to better serve customers. However, the rapid growth of larger e-tailers, the success of mobile commerce, and changing consumer behaviors accelerated the evolution into a reactive innovation. Retailers are discovering they need to make significant changes to their supply chain to align merchandise and make inventory visible and available across all channels.

It's widely known online consumers want more options and have higher expectations—it's up to retailers to meet that demand. Omni-channel is an evolving first step.



Cisco's warehouse of the future

Cisco says the warehouse of the future will focus on automation and integration across the supply chain. That doesn't necessarily mean automated materials handling.

By **Bob Trebilcock**, Executive Editor

At ProMat this year, I spoke to a major retailer who made a provocative statement: Forget all the cool automation on the show floor. He viewed that as a commodity. What he wanted was intelligent software that could give him more real-time information about more aspects of his operations than he was getting now. "I think suppliers need to stop thinking of themselves as hardware shops and start thinking of themselves as software shops," he said.

That sentiment strikes a chord with Jack Allen, senior director of logistics and manufacturing solutions for Cisco. "I walk through a lot of warehouses where people are enamored with the mechanical technology," Allen says. "But, in our view, it's not about mechanical automation: It's about software."

As one of the companies that provide the hardware, software and systems that connect to the Internet, it should come as no surprise that Cisco is focused on the Internet of Everything, or IoE. This is the idea that all of the machines, equipment, gadgets, appliances and things we use in business and our daily lives will be connected to the Internet. IoE is more than just connecting things, it's about connecting things, people, processes and data in a way that's usable and useful.

The idea has supply chain implications—if trucks, conveyors, lift trucks, packages, pallets, people, suppliers and customers can all communicate, there's an opportunity to rethink the way we do things. For that reason, Cisco is in the process of remaking its own supply



“Ninety percent of that is information and not the mechanical movement. That’s why we believe the future will be as much about the movement of data as it is about the physical movement of goods.”

chain processes for the Internet of Everything, and they call it Cisco’s connected supply chain and logistics of the future.

Included are plans for the warehouse of the future. But when Allen and his colleagues talk about a much more automated warehouse, they’re not necessarily talking about materials handling automation. Rather, Cisco is thinking about ways to automate decision-making and mundane processes that are currently done by people.

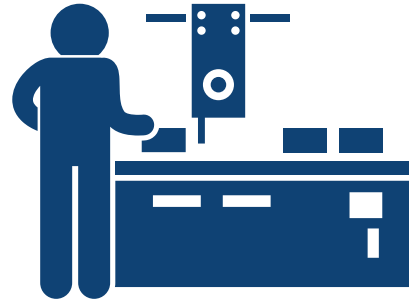
And, it’s more than just software. The warehouse of the future will also use sensors, data collection technologies, analytics as well as smart, connected machines that can communicate more information from more nodes in the supply chain. Put them all together, and you end up with a supply chain that can automatically take actions up and down the supply chain—including inside the four walls of the warehouse—to respond when events occur.



“The value is in the integration of the pieces of the supply chain, what we call the value at the seams,” Allen says. “It’s having access to the information between areas like manufacturing and distribution, shipping and the customer or this silo and that silo.”

Allen uses the example of the Japanese tsunami to illustrate how that might work. “When the tsunami hit, you had a lot of people going through spreadsheets to find out that the material to build the components to build the subassemblies to build the thing that they needed were actually coming from only two suppliers—and they were both in Japan inside the affected zone,” Allen says. “They had to get on the phone and scramble to find supply.”

In a connected supply chain, the system might analyze unstructured data from external information, such as Twitter, and conclude that the tsunami was going to disrupt supply. It would then automatically migrate orders to



factories outside the impacted area or send orders to warehouses that have inventory. “You’re going to speed up trucks already in route to avoid a problem; you’re going to stop trucks that haven’t moved yet; you’re going to issue POs to your secondary source of supply; and you’re going to expedite those orders by putting them on planes,” he says.

The most important aspect of that scenario: It will all happen automatically. People will only get involved to handle the exceptions that cannot be addressed by the system.

To do that, Allen adds, you have to have sensing technologies to know where your trucks, inventory and orders are located; and you have to have the methodology to speed up or slow down your order fulfillment processes. “Ninety percent of that is information and not the mechanical movement,” Allen says. “That’s why we believe the future will be as much about the movement of data as it is about the physical movement of goods.”

He adds, “In the big picture, that’s where we want to go.”

It’s not new

In many respects, the industry has been talking about global visibility, collaboration and event management for years. Moreover, the tools of Cisco’s trade, such as sensors, RFID, RF, data collection technologies and supply chain software are already on the shelf. What’s new, according to Allen, is the integration of these tools to create new and innovative processes. “If you think about it,” he says, “the

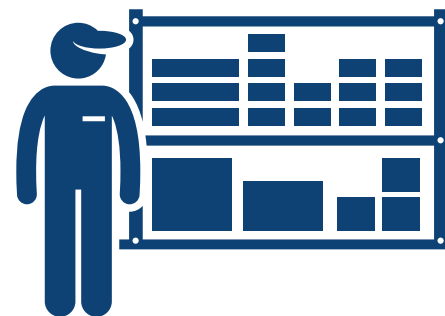
touchscreens and the user interface in the first iPhone weren’t new either. The secret sauce was in how Apple put it all together,” he says. “That’s what we want to do in the supply chain.”

It takes a layered technology model to make all of this happen. The first layer consists of edge-sensing devices that gather structured and unstructured information from across the supply chain. Structured data would include information generated by a system such as a purchase order, confirmation of the receipt of a shipment or a wave of orders created in a warehouse management system (WMS). Unstructured data might include weather or news reports, social media and trend analytics about events that could disrupt operations. That could be everything from the Japanese tsunami to the bankruptcy filing of a critical vendor.

The second layer analyzes that information and makes decisions about what needs to happen next based on rules and protocols. That way, only the exceptions that fall outside the rules have to be handled by people.

The third layer includes the execution systems, like warehouse and transportation management, that put plans in motion and route orders to where they need to go. This is facilitated by workflow, decision support and intelligent agents in a machine-to-machine, management-by-exception environment.

One of the critical components in this model could be the lowly pallet. It’s already a platform for the physical movement of goods. Cisco is also viewing the pallet as a platform to collect, carry and communicate information about the



Jack Allen, senior director of logistics and manufacturing solutions for Cisco

movement of goods. In this scenario, every pallet would be equipped with some kind of a sensing device that can be populated with information about the shipment and automatically updated and read as the pallet moves through a manufacturing plant, distribution center or transportation hub. Something similar could be applied to assets like forklifts in a facility or trucks on the road that would allow them to be tracked. Allen says Cisco is still trying to determine whether that technology should be some kind of a bar code, RFID tag or other sensing device.

Warehouse of the future in action

The point, however, isn’t just to track the location of a pallet, a container or a lift truck. Instead, it is to use these technologies to connect warehouse and logistics processes in innovative ways.

Some of this is already happening at organizations other than Cisco. In Frankfurt, Germany, for instance, Lufthansa Technik Logistik Services, or LTLS, has built a highly automated distribution center to expedite the delivery

of spare parts and components to repair an aircraft that has been grounded for repair. The facility includes a mini-load automated storage and retrieval system (AS/RS) that stores 30,000 parts and components and automatically delivers them to a packing station. When LTLS has a required part in stock, it can have an online order ready to ship within 15 minutes of commitment to the customer.

The backbone of the facility, however, is a unique set of software solutions that includes enterprise resource planning (ERP), transportation planning and a collaboration portal for customers and logistics providers. The system automates the time-consuming process of validating whether LTLS can meet a customer’s service level requirements. In the past, when a customer called with an expedited order, specialists had to get on the phone to confirm that the part was in stock, determine when was the next available flight to the airport where the repair would take place and check on the availability of couriers to pick up and deliver the part. In all, it could take 48 hours from

the first phone call to get a part in the hands of a repair technician.

Today, those steps are automated. Customer orders are received electronically. The system then checks to see if the part is in stock and evaluates all of the available transportation options to meet a service level requirement. If the order is a go, it then automatically creates a transportation plan based on the cheapest option to meet a customer service requirement, schedules the delivery and sends an electronic order to the warehouse, which initiates the order fulfillment process in the mini-load AS/RS. Along the way, the system communicates with the airline ordering the part and monitors the logistics process for any exceptions that would delay delivery.

As a result, LTLs can now reach any airport in Europe within 12 hours of receipt of an order and reduce transportation costs.

Cisco's warehouse of the future

Cisco is similarly using automatic data collection technologies and the cloud to change the way it manufactures and distributes set top boxes to cable cus-

tomers. Each box is uniquely tied to a key that allows a customer to unlock the box when it's installed in a consumer's home. "If you don't have the key, the box is a brick that can't be unlocked," says Allen.

In the past, information about the set top box was collected and managed manually in a time-consuming method. Now, the process is done automatically. The original manufacturer sends identifying information about each box to Cisco's manufacturing execution system (MES) and automated test system. That data is then fed to secure sites in the cloud where key information is stored. When the boxes arrive at a Cisco location, the serial numbers don't need to be scanned—they were scanned once at the manufacturer. All that needs to be scanned are the pallet IDs (license plates), which are scanned into the system and sent to the cloud where they are married with the keys for all of the serial numbers on that pallet. Later, when Cisco builds an order for a customer, the license plate bar code on a pallet provides a link to the infor-



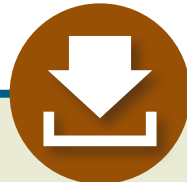
mation in the cloud for all the set top boxes in that order.

"When we send it to a customer, and they scan the license plate bar code, all of the key information they need for the boxes on that order is pulled down from the cloud and goes into their billing system," says Allen. In the past at Cisco, he says, every box had to be manually scanned, multiple times, by Cisco and its customers. "The physical process isn't new," he says. "People have been scanning license plate bar codes for years. What's a model for the future is the process to use the data."

In the warehouse of the future, Allen envisions using data coming from pallets in other innovative ways. For instance, a warehouse could receive information from a carrier about the delivery of a pallet needed for a hot order. The warehouse could then pull together and stage the other items needed for the order in locations equipped with lights with an IP address.

When the hot pallet is scanned at the receiving dock, a lift truck driver would get a signal to go to the dock to get the pallet. The driver could then go to the lit storage locations to assemble the rest of the order. Meanwhile, the system could automatically schedule the outbound transportation for that order and notify the customer that it's on its way. "Bar code scanning isn't new," Allen says. "But the process is new."

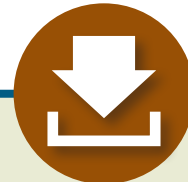
"I believe we're at a major cusp of another wave of disruption, another wave of productivity in the warehouse," he adds. "In a connected world, we're going to be much more intelligent about how we do things and use things." □



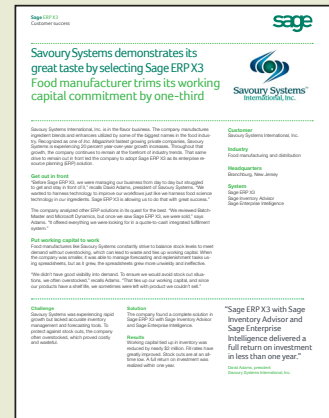
DOWNLOAD WHITE PAPER



St. Joseph Paper and Packaging implemented a new enterprise resource planning software package and sales are up by 16 percent in the first year with 50 percent of orders initiated through Sage Mobile Sales.



DOWNLOAD WHITE PAPER



Manufacturer Savoury Systems International is experiencing 20 percent year-over-year growth increases after the adoption of Sage X3 as its complete business management.





Distributors Seek Edge

TECHNOLOGY INVESTMENTS DELIVER RETURNS FOR SMALL AND MIDSIZE COMPANIES.

Although small and midsize distribution companies may be growing rapidly, they face distinct challenges in running efficient business processes. As they seek to compete on an equal footing with their larger rivals, these companies are well aware of the issues they face. Topping the list are technology integration, mobile technology, and warehouse logistics, according to a recent IDG Research survey.

Integration

As small and midsize organizations attain success, the business systems adopted during their initial growth, which are often spreadsheet-based and/or homegrown system databases, many times don't scale easily to meet their needs. Whether due to organic growth or growth by acquisition, these companies face the task of integrating new technology with legacy systems, sometimes through stopgap solutions. Integrating new technology with legacy systems to have a single view of the business was cited as the top challenge by 70% of respondents.

Mobile operations

Second in priority is the use of mobile technology to make sales and customer service more efficient, with 65% identifying it as a challenge. Mobile technology can help distributors better serve customers by giving sales and customer service representatives information at their fingertips when they visit customer sites or make deliveries.



TOP 3 CHALLENGES FOR RETAIL, WHOLESALE, DISTRIBUTION

- Integrating new technology with legacy systems to have a single view of the business → 70%
- Using mobile technology to make sales and customer service more efficient → 65%
- Improving the efficiency of warehouse logistics & the accuracy of order fulfillment → 60%



Warehouse logistics and order fulfillment

Third on the list of challenges at 60% is improving the efficiency of warehouse logistics and the accuracy of order fulfillment. Software that can enable a warehouse to operate at a higher level of efficiency has great value to a distributor.

“We have more than 40,000 part numbers, thousands of customers, and dozens of locations. It is vital to our success that we have the products our customers want, available when and where they want them. Sage ERP X3 helps us do that.”

— RICH UNTERBRINK, IT MANAGER, RUSSELL SIGLER

Meeting the challenges

Not only are distributors aware of these challenges, they want to address them. According to the survey, the top priorities closely mirror the top challenges. These are:



TOP 3 CHALLENGES MOST WANT TO FIX FOR WHOLESALE AND DISTRIBUTION

- Integrating new technology with legacy systems to have a single view of the business → 23%
- Using mobile technology to make sales and customer service more efficient → 20%
- Optimizing inventory management and demand forecasting → 14%

Business insights

The survey has an interesting story to tell when it comes to the investments companies make and the returns they receive on those investments. The most popular investment, and the one earning the highest return, is collecting business insights—such as profitability, freight costs, and customer data—to drive decision making. Seventy-eight percent of respondents made an investment in technology to improve in this area, and 100% saw improvement as a result of that investment.

“The software automatically generates and distributes past due reports each day to our sales and customer services reps. As a result of our being able to stay on top of overdue invoices, we've decreased our days sales outstanding by 18 full days. Our cash flow is much improved as a result.”

— JOHN BABCOCK, CFO, SATELLITE INDUSTRIES

Investments in technology deliver results



INVESTMENTS AND IMPROVEMENTS FOR WHOLESALE AND DISTRIBUTION

	Made an investment last 1-2 years	Saw improvement as a result of investment
Collecting business insights (e.g., profitability, freight costs, customer data) to drive decision making	78%	100%
Leveraging customer relationship management to manage new sales opportunities	73%	90%
Using mobile technology to make sales and customer service more efficient	68%	89%
Rapidly analyzing/connecting business insights to drive decision making	65%	93%
Integrating new technology with legacy systems to have a single view of the business	65%	63%
Improving the efficiency of warehouse logistics & the accuracy of order fulfillment	65%	77%
Optimizing inventory management & demand forecasting	55%	77%
Automating business processes to shorten payment cycles and better manage cash flow	55%	82%
Ensuring compliance with Sarbanes Oxley and other government reporting	53%	71%
Integrating e-commerce and mobile channels with ERP and other business management software	48%	90%
Improving supply chain visibility and collaboration	45%	89%

CRM

In second place is leveraging customer relationship management to manage new sales opportunities. Seventy-three percent of respondents made an investment in technology to improve in this area, and 90% saw improvement as a result of investment.

“We can see precisely what is on hand and what is on order. Our customers appreciate the speed and accuracy of our order processing cycle.”

— LUZ CARVAJAL, CONTROLLER, MARATHON BRAKE SYSTEMS

Mobile

Using mobile technology to make sales and customer service more efficient is in third place: 68% made an investment in technology to improve this area, and 89% saw improvement as a result of that investment.

“We always have updated information about our business operations. We don’t have to wait for the end of the day to know exactly where we stand.”

— FRAN TAGLIA, CHIEF OPERATING OFFICER, POWER DISTRIBUTING

Even in areas that saw less investment comparatively, improvements as a result of those investments are much in evidence. For example,

SMALL AND MIDSIZE CONTRASTS

The difference in the way that smaller organizations (10–99 employees) and midsize businesses (100–499 employees) grapple with business challenges can be significant, according to the IDG Research survey. For example:

- Integrating legacy systems to have a single view of the business is less challenging for small businesses compared to midsize organizations.
- When it comes to investments and improvements seen, integration is also a greater challenge for midsize organizations.
- Midsize organizations are more likely to invest in integrating new technology with legacy systems to have a single view of the business (80% vs. 53% of smaller organizations) in the next two years.
- Smaller organizations are less likely to invest (53% vs. 76%) in rapidly analyzing/connecting business insights to drive decision making, as well as optimizing inventory management and demand forecasting (49% vs. 71%).
- Lack of clear ROI is a much greater challenge for midsize organizations (35% vs. 14%)

while only 45% of respondents say they invested in improving supply chain visibility and collaboration in the past one to two years, 89% saw improvements as a result of those investments. Similarly, only 48% invested in integrating e-commerce and mobile channels with ERP and other business management software, yet 90% saw improvements as a result.

Areas of greatest change



INVESTMENTS FOR RETAIL, WHOLESALE, DISTRIBUTION

	Made an investment last 1-2 years	Likely to invest in the next 1-2 years
Collecting business insights (e.g., profitability, freight costs, customer data) to drive decision making	78%	73%
Leveraging customer relationship management to manage new sales opportunities	73%	68%
Using mobile technology to make sales and customer service more efficient	68%	75%
Rapidly analyzing/connecting business insights to drive decision making	65%	65%
Integrating new technology with legacy systems to have a single view of the business	65%	68%
Improving the efficiency of warehouse logistics & the accuracy of order fulfillment	65%	85%
Optimizing inventory management & demand forecasting	55%	65%
Automating business processes to shorten payment cycles and better manage cash flow	55%	70%
Ensuring compliance with Sarbanes Oxley and other government reporting	53%	60%
Integrating e-commerce and mobile channels with ERP and other business management software	48%	63%
Improving supply chain visibility and collaboration	45%	70%

Sage

According to the survey, the biggest barrier to technology investments is not knowing which technology solution will help achieve business goals and determining which vendor is right for the business. Many small and midsize distributors are turning to Sage, which has helped more than 58,000 such companies in North America solve major business challenges and cultivate growth with comprehensive ERP and business management solutions. They are finding that Sage resolves integration issues as companies grow, successfully incorporates mobile technology, and improves efficiency through business intelligence technology.

Sage business solutions for distributors include:

- Finance and accounting
- Supply chain
- Warehouse and inventory
- Customer service
- Sales and marketing
- HR and payroll

The desire for greater visibility is a recurring theme throughout the survey. The investment that is seeing the biggest percentage jump is “improving supply chain visibility and collaboration.” Forty-five percent of respondents say they invested in that area in the last one to two years, but 70% will make an investment in that area in the next one to two years. Other areas showing significant change in investment are:

- Improving the efficiency of warehouse logistics and the accuracy of order fulfillment will jump from 65% over the past one to two years to 85% in the next one to two years.
- Integrating e-commerce and mobile channels with ERP and other business management software will increase from 48% in the past one to two years to 70% in the next one to two years.
- Automating business processes to shorten payment cycles and better manage cash flow will rise from 55% in the past one to two years to 70% in the next one to two years.

Compliance spending subsides

Initiatives that ensure compliance with Sarbanes-Oxley and other government reporting regulations are receiving a low level of investment, which will tend to diminish further in the future. Such spending ranked ninth over the past one to two years and will fall to eleventh (last place in the survey) over the coming one to two years. This trend indicates that the high-level of compliance spending that resulted from the enactment of regulations following the bursting of the dot-com bubble of the year 2000 and the financial meltdown of 2008 has subsided, and companies are ready, as indeed our survey indicates, to invest in measures that enhance productivity and their competitive posture generally.

High achievers

Finally, in perhaps the most telling result, the survey reveals that small and midsize businesses with the highest revenue growth year-over-year (over 10% growth) are significantly more likely than their peers to recognize that they are facing challenges in the daily operation of the business. These include rapidly analyzing and connecting business insights to decision making, improving supply chain visibility, integrating e-commerce and mobile channels with ERP, and using mobile technology to make sales and customer service more efficient.

Further, while all companies are investing in technology to address key business challenges, high-performing SMBs are significantly more likely to report seeing an improvement from those investments in their ability to integrate new technology with legacy systems and improve supply chain visibility.

In the next two years, high-performing small and midsize businesses are significantly more likely to invest in technology to address three areas: rapidly analyzing and connecting business insights to drive decision making, integrating new technology with legacy systems to provide a single view of the business, and using mobile technology to make sales and customer service more efficient.

What’s next?

Overall, the survey finds the top priority for wholesale and distribution companies in the next one to two years is improving the efficiency of warehouse logistics and the accuracy of order fulfillment; 85% of respondents rank these investments first. Second is using mobile technology to make sales and customer service more efficient (75%). Following closely behind at 73% is collecting business insights, such as profitability, freight costs, and customer data, to drive business decisions. In a significant shift, investments to improve supply chain visibility and collaboration were at the bottom of the list for the last two years (45%), but 70% now have plans to invest in these technologies.

Summary

For small and midsize businesses, the need to continually improve business processes is an ongoing priority. There’s good news, however. The IDG Research survey reveals these companies are aware of the areas that are most in need of addressing. The survey also finds they have achieved tangible returns from previous investments in these areas, even as they look forward to returns from further investments in the future.

To learn more about Sage business solutions for distribution, please call **866-530-SAGE (7243)** or visit us online at [Sage Wholesale Distribution](#).

