THE GROWING IMPACT OF E-COMMERCE

E-commerce has already had a significant impact on warehouse operations and that impact will only increase as e-commerce continues to be the fastest growing segment of the economy. Global retail e-commerce sales are expected to reach $3.9 trillion dollars by 2020, up from $2.3 trillion in 2017.\(^1\)

At the same time, customer expectations for delivery are changing, with two-day delivery now the norm on e-commerce orders. This is forcing fulfillment operations to compress cycle times and provide more options in terms of delivery and cost. A survey of e-commerce retailers by Temando found that 43 percent of retailers drove increased revenue by offering better choices in e-commerce delivery. Among enterprise retailers, 33 percent reported a reduction in cart abandonment when offering more shipping choices, while 50 percent of mid-market retailers experienced increased sales.\(^2\)

The choices consumers now expect are not limited to shipping. Retailers, both traditional and e-commerce, are realizing that consumers want choice across their entire shopping experience. They want to be able to research products online, evaluate products in brick-and-mortar stores and purchase, take delivery and perform returns through either channel as part of a seamless experience now widely referred to as omni-channel.

This has caused traditional retailers to move aggressively into e-commerce and once “pure” e-commerce companies to establish a foothold in the physical world. The result is more complexity in product storage, picking and delivery as these companies seek to support e-commerce and omni-channel sales more efficiently without establishing parallel distribution networks.
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For example, a retail customer that is a global leader in transportation and third-party logistics, made the decision to strengthen its competitive position in e-commerce by investing in future-proof automation technology. The company implemented Swisslog’s CarryPick, a robot-based, goods-to-person picking solution, in its Stockholm, Sweden 3PL intralogistics facility for Lekmer.com, the Nordic region’s largest retailer of children’s products. According to the strategic business development manager, the use of modular, intelligent automation allowed the company “to deliver levels of productivity that exceed all manual solutions in the industry.”

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The impact of e-commerce is not limited to the retail warehouse. The size of the B2C e-commerce market is already dwarfed by the B2B market, which reached $7.7 trillion in sales in 2017. This is opening new opportunities for B2B companies, but also creating new stresses on the supply chain as they wrestle with many of the same challenges as their retail counterparts.

Other industries face similar challenges. Consumer products companies now routinely have to support smaller, on-demand shipments, while pharmaceutical companies are facing new serialization regulations. Even manufacturers, whose intralogistics operations must support greater product customization and shorter manufacturing runs, are evaluating changes in how products are stored and moved in the warehouse.

Across a variety of industries, new competitors, advances in technology and shifting market expectations are creating unprecedented change in the warehouse.

Consider the case of Radwell International, which sells a wide range of new and surplus electronic equipment. With the business growing by double-digits annually and the number of products expanding above one million, the company’s warehouse had become size-constrained and manual picking processes could no longer deliver the required speed and efficiency. By implementing AutoStore, an automated, modular goods-to-person picking system, Radwell was able to more than triple its pick rate and better utilize its space to enable future growth.

The company was able to phase in Swisslog’s system over several months to minimize disruption and can easily scale the system as needs change. The modular design of the storage system selected by Radwell allows additional robots to be added to the existing system to increase throughput. Additional storage modules can be added to expand storage capacity.

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While forward-thinking organizations like Radwell are implementing automation to address their challenges, others are being forced to adapt to change by hiring additional workers.

This has become a significant challenge in the current labor market for many regions across the globe. Competition for reliable warehouse workers has never been fiercer in some areas as labor-hungry warehouse operators now routinely offer signing bonuses and other perks to attract new workers, creating higher turnover and driving up costs in an industry already operating with tight margins.

There are no signs the labor market for warehouse workers will improve in the future; demographics and other factors indicate this is a situation that will only get worse in the coming years and labor laws in many areas are getting more restrictive, further increasing the challenge.

The need for warehouses to become less labor-dependent, while implementing solutions that improve workplace ergonomics and thus worker satisfaction, is no longer a matter of managing costs or increasing speed. It is a matter of survival. The workers required to perform manual operations will, in many cases, simply not be available.
While it’s impossible to predict what any particular warehouse will look like in the future as technology continues to advance at an unprecedented pace, it is possible to anticipate the requirements those warehouses will need to meet.

These include increased productivity to minimize the impact of the labor shortage, enhanced flexibility and space utilization to accommodate the growth in SKUs, greater anticipation of demand, higher throughputs and faster deliveries.

For years warehouses operated as largely manual operations, relying on little more than forklifts and people to receive, store and ship products. These labor-intensive operations typically had a much lower number of products than current warehouses and didn’t face the demands of higher customer expectations and smaller order sizes that today’s warehouses face.

Then came the age of mechanization when mechanized sortation and conveyor systems brought a degree of automation to the warehouse. Mechanized systems helped warehouse operators meet rising throughput requirements while increasing productivity and safety.

The downside of these systems included their high cost, relatively long payback period and lack of flexibility. They were prone to long deployment times and, because of their fixed nature, were unable to adapt to changes in product mix or characteristics and market demand. As a result, many failed to achieve their projected return on investment.

The current phase of warehouse evolution is marked by intelligent automation that focuses on flexible and scalable technologies that deliver the performance benefits of mechanized systems but with the ability to implement in a phased approach and adapt to change. These systems are epitomized by the CarryPick and AutoStore systems used by our retail customer and Radwell respectively. They share three common characteristics that are outlined in the following section.
At Swisslog, we've identified three characteristics of warehouse systems capable of adapting to whatever the future brings:

1. **Data-driven**
   Data is a powerful tool in warehouse management, but one that is only beginning to be harnessed. From bar codes on products to sensors on equipment, there is a wealth of data available today that can help improve equipment availability and efficiency, personnel productivity and safety, and process throughputs.

   The key to harnessing the power of warehouse data lies in warehouse management and execution software. As warehouse software has evolved, siloes have been created, with warehouse management, warehouse execution and automation control systems all operating in a way that leaves data isolated, limiting its potential to improve operations.

   The new generation of warehouse management software, as exemplified by Swisslog’s SynQ system, integrates these various functions into a single platform to unleash the power of data.

   For example, the SynQ Availability Manager allows users to identify the exact availability of every element in the warehouse along with every associated workflow, taking into account the required throughput and business processes. This provides a seamless overview of the entire system, and the parts that comprise it, to avoid potential bottlenecks and plan service and maintenance with a much higher degree of accuracy.

   Another example is SynQ's Cockpit Manager, which uses real-time data from equipment and products, along with knowledge of the system layout, to provide a real-time, three-dimensional view of warehouse operations through the platform’s 3D interface.

   Managers can get a comprehensive, real-time view of processes to monitor products as they move through the warehouse and optimize performance and efficiency. In the near future, this capability will enable users to simulate changes in throughput or process configurations to understand exactly how they will impact overall operations and identify over or under utilization of equipment and personnel.

   Swisslog’s SynQ software provides a real-time, three-dimensional view of warehouse operations

2. **Flexible**
   The mechanized warehouse delivered the throughputs many warehouse operators required but lacked flexibility and, as a result, was often outdated within months of implementation.

   The current and future generation of warehouse automation eliminates this limitation through solutions that are faster and easier to deploy and are modular and repurposeable.

   The best examples are the AutoStore and CarryPick systems mentioned previously.

   AutoStore uses robots and bins to quickly process small parts orders. It optimizes space utilization through a unique design that enables direct stacking of bins on top of each other and storage of multiple SKUs in a single bin. Over time, the system automatically learns which products have a higher rotation, storing them on the top layer to ensure faster picking times.
The mobile CarryPick robots power a goods-to-person picking solution in which racks of products are delivered to picking stations by the robots. The intelligent robots require no physical changes to the warehouse so additional robots can be added at any time to meet increased throughput requirements. They can even be picked up and transported to a new location to meet changing demand or accommodate warehouse moves.

Having the right partner engaged early in the process can help ensure maximum flexibility is designed into a particular system, regardless of the specific technologies used. The selected automation partner should have a range of technologies from which to choose to prevent instances of force-fitting technologies into applications in ways that limit future flexibility. The right partner can not only help align a system to existing process requirements but also help anticipate future changes and plan proactively for dealing with them.

3. Robotics
AutoStore and CarryPick represent just the first wave of robotics driving increased speed and productivity in the warehouse. Picking and palletizing make up as much as 60 percent of warehouse operational costs. They are not only time-consuming but also the unit of operation that is most affected by the current labor shortage. It is getting harder to find reliable workers willing to perform these repetitive tasks.

Until recently, these processes have resisted automation because of the complexity involved in selecting and picking individual items or cases. What is easy for humans has proven more difficult for robots. However, the last several years have seen dramatic improvements in the vision and gripping capabilities of robots, spawning a new generation of automated picking solutions, such as Swisslog AutoPiQ and ACPaQ.

AutoPiQ is a robot-based piece picking solution capable of delivering accurate and flexible picking performance while providing the basis for future-proof intralogistics. ACPaQ provides a similar function for mixed case palletizing. As these solutions evolve, they will increasingly allow warehouse operators to focus their human resources on more strategic tasks while robots perform the repetitive work of picking and palletizing products.
The experience with mechanized warehouse systems, which delivered high throughput but offered little to no flexibility, has left some warehouse operators skeptical of automation. However, the current generation of warehouse automation systems has overcome the challenge of mechanized systems through a focus on intelligence, modularity and robotics that together provide the flexibility to adapt to changing conditions. These systems not only don’t impede the ability to respond to change, they enable it by allowing operators to better predict future demand and to respond to change efficiently and cost-effectively.

As warehouse operators plan for a future that is difficult to predict, building around the pillars of data-driven, flexible and robotic systems help ensure their investments not only pay dividends in the short term but can carry them well into the future.

To learn more about flexible, data-driven and robotic warehouse automation systems, talk to your Swisslog representative or visit swisslog.com.

REFERENCES

2. Source: Multichannel Merchant Study Finds Expectations Not Being Met in Ecommerce Delivery, June 30, 2017