Warehouse Insights

Trends Shaping Intralogistics in 2023





Introduction

What happened to the security and synchronization that once defined intralogistics? With millions of SKUs flowing out the doors, rising consumer demands, the growth of omnichannel order fulfillment and a decreasing labor market, warehouse efficiencies are tumbling down a steep and bumpy road. As a result of this turmoil, intralogistics trends and modern tools are emerging to keep organizations a step ahead.

Higher working speeds, individual customer requirements and a multitude of new technical possibilities will change the industry's in-house logistics massively by 2040.¹ As the world embraces Logistics 4.0, organizations will continue to transition more and more to semi and fully automated processes thus diminishing the stress caused by common warehouse inefficiencies. It is expected that global warehouse automation sales will reach approximately 39 billion euros by 2027, at a compounded annual growth rate of approximately 15% between 2022 and 2027.²

Are you interested in what a modern warehouse will look like and which tools are necessary to keep your intralogistics fit for the future? Kardex presents this Warehouse Insights report to introduce companies to key 2023 intralogistics trends and shares which warehouse tools will enhance end-user experiences.

The 3 Key Intralogistics Trends in 2023



Impact of technologies on supply chain³



Where trends come from?

To understand which tools the future requires involves taking an in-depth look at what trends are on the horizon and where they stem from. The Material Handling Industry (MHI) Annual Industry Report clearly shows companies are feeling challenged by hiring and retaining qualified workers, customer demands for faster response times, forecasting and the synchronization of supply chains.³

Kardex has first-hand experience with the unique challenges specific industries are undergoing. The retail industry is facing unprecedent delivery demands, pharmaceuticals crave more accurate processes and Third-Party Logistics (3PLs) are taking on more diverse client portfolios despite rising real estate costs. As each industry reacts to its own disruptions, across the board challenges are also apparent. Warehouses everywhere are stumbling over the lack of productivity and efficiency due to instabilities caused by labor shortages, unpredictable business growth and outdated operations.

To overcome these common setbacks, new trends begin to emerge. Always at the forefront of innovation, Kardex has a comprehensive understanding of why new trends begin to arise and which will become indispensable to warehouse processes.

¹ Logistics 4.0 Intelligent, Integrated, Autonomous. Roth, Florian and Dr. Julian Popp. June 2020. ² \$41 Billion Global Warehouse Automation Market (2022–2027). Businesswire. 27 May 2022. The above outlined data was taken from a US-centric publication, meaning all figures were changed from USD to EUR for the European audience. Exchange rates are subject to fluctuation. The exchange rate was applied on 8 December 2022. ³ Evolution to Revolution. Building the Supply Chains of Tomorrow. 2022 MHI Annual Industry Report.

Little to no impact

Intralogistics Trend: Flexible Production

In a fast-moving world with continuously changing demands and increasing real estate costs, companies crave innovative intralogistics solutions. Flexible and dynamic systems manage inventory fluctuations with speed and precision, enable high product availability and optimize order fulfillment. Modular and scalable systems seamlessly adapt in scale allowing expansion without forcing relocation.

Fast, flexible and accurate

The rise in desire for flexibility stems from a strong-rooted need. A flexible production system can immediately and efficiently respond to a crisis or unexpected peak. In the situation of COVID-19, companies needed to react to supply chain stoppages, regulatory uncertainties, labor constraints and urgent consumer needs.

Although COVID-19 is exceptional, the urgency of flexible production relates to everyday situations especially in areas such as retail. Managing staffing during unpredictable spikes and seasonal peaks are standard practices in e-commerce. However, if the labor market continues to prove problematic, companies can't depend on or predict staffing needs. This doubt in the labor market has pushed automation to the forefront and practically eliminates the stress many warehouses are facing today.

Additionally, without flexible and scalable intralogistics solutions, facilities often have large empty spaces for a significant portion of the year. A factor that is becoming increasingly more important to recognize as real estate practicalities evolve. Warehouse and distribution rents in the United States rose 22% year over year to \$18.70 per square foot in Q3 2022.⁴ In Europe logistics vacancy rates went from 5.1% to 3.5% and in parts of Europe vacancy rates were one of the lowest worldwide.⁵ As costs increase and property options decrease, the benefits of automation push forward once again.

Flexible production is the foundation for solutions such as Automated Storage and Retrieval Systems (ASRS). They can reduce the required footprint space by 85%, cut down on labor costs and ensure an ergonomic working environment. Their ability to add or reduce capacity without impacting a facility's overall footprint is extremely cost effective in terms of real estate space and productivity rates.

⁴ Cushman & Wakefield, U.S. Industrial MarketBeat Report, Q3 2022.

⁵ Mofid, Kevin. Savills. Spotlight: European Logistics Outlook. 23 February 2022.

Let's look at how Kardex understands the value of space and has designed tools to maximize an existing warehouse footprint. If you take the inventory held in 120 bays of static shelving, it can be condensed into two <u>Horizontal Carousel</u> <u>Modules</u> (66% space savings), two <u>Vertical Carousel Modules</u> (75% space savings), a single <u>Vertical Buffer Module</u> (75% space savings) or a single <u>Vertical Lift Module</u> (85% space savings).

Taking this a step further and realizing the urgency to achieve higher production and greater efficiency, Kardex recently introduced an extended version of its Kardex Compact Buffer. It can now extend up to 20-meters long, optimizing the entire space of a facility from top to bottom and from side to side.

By working hand-in-hand with customers, Kardex can customize intralogistics solutions to fit each specific customers' needs. By using an integrated and flexible approach, Kardex can seamlessly modernize customers' facilities to meet growing business needs.

Learn about how Kardex delivered a state-of-the-art picking system at the kitchen manufacturer, nobilia, where every single kitchen is individually planned. With the complete replacement of the picking devices and an extensive refurbishment of the conveying technology, the throughput of the overall system increased by 10%.





Driven by rapid technological advancements and greater affordability, robotics solutions are rapidly entering the workforce. "With the shifting economic and social paradigms amid the COVID-19 pandemic, the global robotics market growth rate is expected to rise 32% by 2025, when it will be worth an estimated 169 billion euros."⁶

The age of the robots

Robots are adding speed and precision to struggling processes across the supply chain. They support zero-defect processes, boost productivity/throughput and cut costs while meeting increasing consumer demands. Globally, countries are experiencing one of many waves the industry will see in terms of integrating automation by means of robotics.

A variety of robotics are now available including Autonomous Mobile Robots (AMR), Automated Guided Vehicles (AGV), pick and place robotics and robotic cube storage technologies such as <u>AutoStore</u>. Although different in specific capabilities, as a whole, robotics are transitioning warehouses to faster, more precise facilities and integrate easily across a variety of industries. It is expected that by 2025, 45% of all manufacturing will be performed by robotic technology"⁷ and the utilization rate of autonomously driven trucks will rise from currently 29% to 78% by 2030."⁸

Modern Materials Handling looked at factors motivating organizations to pursue robotics in warehousing and distribution centers with the top three being: increase flow/throughput; help address labor availability constraints and improve labor productivity.⁹ When considering the flexibility and scalability of robotics, it is evident to see the extreme advantage they provide. The interest in flexibility is tied to the growing interest in minimizing infrastructure and allowing warehouses to move, restructure and reconfigure at a moment's notice – driving a rise in robotic AMRs over built-in conveyors.

⁶ Doo-Won, Cha. Robots Jump into the Mobility Industry. 21 January 2021. The above outlined data was taken from a US-centric publication, meaning all figures were changed from USD to EUR for the European audience. Exchange rates are subject to fluctuation. The exchange rate was applied on 8 December 2022.

- ⁷ Piece Picking Robots Market Growth, Trends, COVID-19 Impact and Forecasts (2022–2027).
- ⁸ Strategy & Truck Study 2018: Digitalisierung und autonomes Fahren halbieren Logistikkosten bis 2030
- ⁹ <u>Trebilcock, Bob. Modern Materials Handling. The State of Robotics.</u> 10 May 2022.

Building on the case to minimize infrastructure, scalability, as a core feature of robotics, reigns as high as flexibility. Scalability lets businesses add robots and therefore increase throughput without requiring additional space. As demands increase so can the number of robots. In some cases, facilities are renting robots on a monthly basis to assist in high-demand situations.

Another main reason we see the rise in robotics relates to how robots are working alongside humans. Businesses can add robots to further support manual labor and enhance existing processes. For example, it is possible to batch pick to a group of AMRs rather than a typical batch station. Robots can also shorten warehouse order pickups, one of the most time-consuming areas of the supply chain and reduce the time workers spend walking and searching.¹⁰

Annual installations of industrial robots - worldwide



Source: World Robotics 2022

Automated Picking

Diving deeper into the robotics sector, we take a closer look at how Kardex is integrating automated picking into its portfolio and highlight specific tools that will become vital to warehouse logistics including automated picking via conveyor systems or pick and place robotics.

#1 Automated picking with conveyor systems

Did you know it is possible to transfer goods, regardless of size, automatically in and out of an ASRS without a human or robot? An automated picking solution with conveyor system does exactly that. In one example, a Kardex Compact Buffer receives a signal when the last position of an order is stored. It then immediately conveys all bins belonging to the order to one of six packing stations, allowing the company to efficiently ship 1,000–1,500 parcels daily. The benefits include increased picking accuracy, faster order fulfillment and additional storage space.

Learn more about automated picking with conveyor systems by watching the video from Kardex customer Delaval





#2 Automated picking with pick and place robotics

As a key ingredient to a warehouse or distributor's recipe for success, McKinsey & Company named the picking robot as one of 10 prominent technologies that could remake warehouse operations.¹¹ Using advanced eye-hand coordination, pick and place robots can pick, process and place single items and full cases to and from any picking station and storage system. The robots seamlessly integrate into existing warehouse management systems and automate picking and replenishment 24/7.

The 24/7 functionality helps counter labor shortages many warehouses are challenged with today. The robots can fully automate order picking, (de-)palletizing, and putaway/replenishment by picking, handling and placing individual items as well as cartons and entire totes. These tasks are completed accurately, relieving the negative financial and service-quality impact mispicks cause.

Especially in the wholesale, retail, e-commerce and manufacturing industries, pick and place robotics prove to be very efficient. They manage fluctuating demands, tight deliveries, inventory transparency, a high number of SKUs and can process orders quickly and accurately. While manual order picking is extremely time-consuming, picking robots can execute up to 1,200 picks/hour.

Learn more about automated picking with pick and place robots

¹¹ McKinsey & Company. Automation in logistics: Big opportunity, bigger uncertainty. Dekhne Ashutosh, Greg Hastings, John Murnane and Florian Neuhaus. April 2019.

Intralogistics Trend: Predictive Analytics

Predictive analytics is a "branch of advanced analytics that makes predictions about future events, behaviors, and outcomes. It uses statistical techniques – including machine learning algorithms and sophisticated predictive modeling to analyze past and current data to prepare for unplanned occurrences."¹²

A step ahead

Instead of rigid production processes, future decisions will be made independently by systems during operations using algorithms. This algorithm-based production will enable flexible, faster and more cost-effective production.¹³

Kardex is a step ahead of ways to incorporate this new technology. From capturing data at a machine level with the help of sensors and pushing it into the cloud to pre-processing and cleaning data to finally using it for predictive analysis, Kardex uses advanced data tools to optimize processes.







Demand forecasting & inventory management – Avoid stock shortages and prepare for spikes in demand



Product quality – Eliminate the cost burden of expired/poor-quality goods

¹² What is predictive analytics. SAP.

¹³ Logistics 4.0. Roth, Florian and Dr. Julian Popp. June 2020.

Data leads the way

As previously referenced, MHI and Deloitte Consulting LLP surveyed more than 1,000 supply chain and manufacturing leaders to learn how they are responding to the global pandemic and how they are transforming supply chains to become more resilient by adopting several technologies. The MHI Annual Industry Report showed that the adoption rate of predictive and prescriptive analytics for supply chain innovations and technologies will jump from 28% to 79% in the next five years.¹⁴

Kardex already has many of these forward-thinking applications in place. For example, the Kardex Connect proactive monitoring system uses sensors to receive machine symptoms or warnings and proactively contact the customer. If this occurs, errors are detected and fixed remotely (if possible), reducing the wait time and costs associated with on-site technicians. With Kardex Connect, Kardex is developing a digital service that enables customers to receive an extensive analysis (e.g., callouts, utilized capacity per machine, completed cycles, etc.) to ensure the customer has live machine information at all times and from anywhere. It identifies fluctuations in the machine's capacity and informs when utilization is lower than expected.

At this very moment Kardex has over 2,700 machines connected through Kardex Connect with a focus on remote support. 100 of these machines are actively pushing data (~3.6%). Kardex is actively working to continually improve Kardex Connect offering additional benefits, customized reports, machine insights, tailor-made KPI's and more.

¹⁴ Evolution to Revolution. Building the Supply Chains of Tomorrow. <u>2022 MHI Annual Industry Report.</u>



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Predictive maintenance

Kardex is aware of the importance of predictive maintenance. Surprise breakdowns set facilities back countless hours. Using predicitive maintenance, machine sensors follow abnormal behavoirs, trends and patterns to forecast if a breakdown might occur in the next 24 hours.

Last year, Kardex detected 1,800 events associated with potential problems through Kardex Connect and solved 75% remotely. By further developing its digital services, Kardex will create an entirely new luxury for customers.

Demand forecasting & inventory management

Unexpected product spikes can turn efficient operations upside down. By forecasting the raw materials, semi-processed and finished products a warehouse will require one week, one month and even in one year from now, internal planning becomes not only smoother, but also more cost-efficient. It allows a facility to ensure stock is ready proactively instead of reactively.

Product quality

Expired and poor-quality goods should not be part of the production line. However, it is difficult to manage this manually. Predictive analytics uses cameras, scales and sensors to keep track of finished goods. It identifies trends to show if product quality is deteriorating over time and signals if products reach a critical value that is no longer accepted.

Kardex Connect



Remote Support Remote Maintenance and





Assistance & Conferencing

Uses the Assist & Conferencing app to bring a technician's eyes



Analytics Visualize KPIs across



Smart Monitoring

by using alerts and warnings as a form of smart processing.



Conclusion

Technologies that were once unimaginable are now affordable and breakthroughs are being made for challenges warehouses have been experiencing for years. For warehouse operations to remain successful, it is essential to be open to change and adapt new technology and processes.

As an industry leader, Kardex is on the cutting edge of these advancements. We offer stateof-the-art, customized intralogistics solutions for individual requirements across various sectors. Our automated storage, retrieval and material handling systems are based on decades of working with small to large-scale businesses in every corner of the globe. We have seen first-hand how every industry has its own unique challenges and demands and regularly enhance our portfolio based on continuously changing industry trends and consumer needs.

i Contact a specialist

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