swisslog

THE SUPPLY CHAIN OF THE FUTURE:
INTEGRATED AND AUTOMATED

CONTENTS

# › ON THE CUSP OF CHANGE

The world is changing quickly. Urban centers are becoming more populated and denser. Populations are aging in developed countries and the middle class is expanding in emerging economies. Consumers are showing a growing tendency to reward businesses for operating in ways they perceive as sustainable or eco-friendly.

Simultaneously, traditional business models are being disrupted by new technology-driven businesses that seek to revolutionize everything from transportation to healthcare.

These trends are already driving changes that directly impact the supply chain and more are on the way. Within the warehouse, organizations have responded by embracing new approaches to warehouse automation that enable greater speed and flexibility.

However, as consumer behaviors, demographics and technology continue to evolve, the changes occurring in the warehouse today will need to extend upstream to production processes and downstream through last mile delivery, with each process working in concert to enable greater customization, speed and efficiency.

This e-book, which integrates the supply chain expertise of Swisslog with the production expertise of KUKA, reviews the major trends and establishes a vision for integrating and automating production and logistics to deliver the productivity, agility, and speed required to remain competitive as society and technology continue to change.
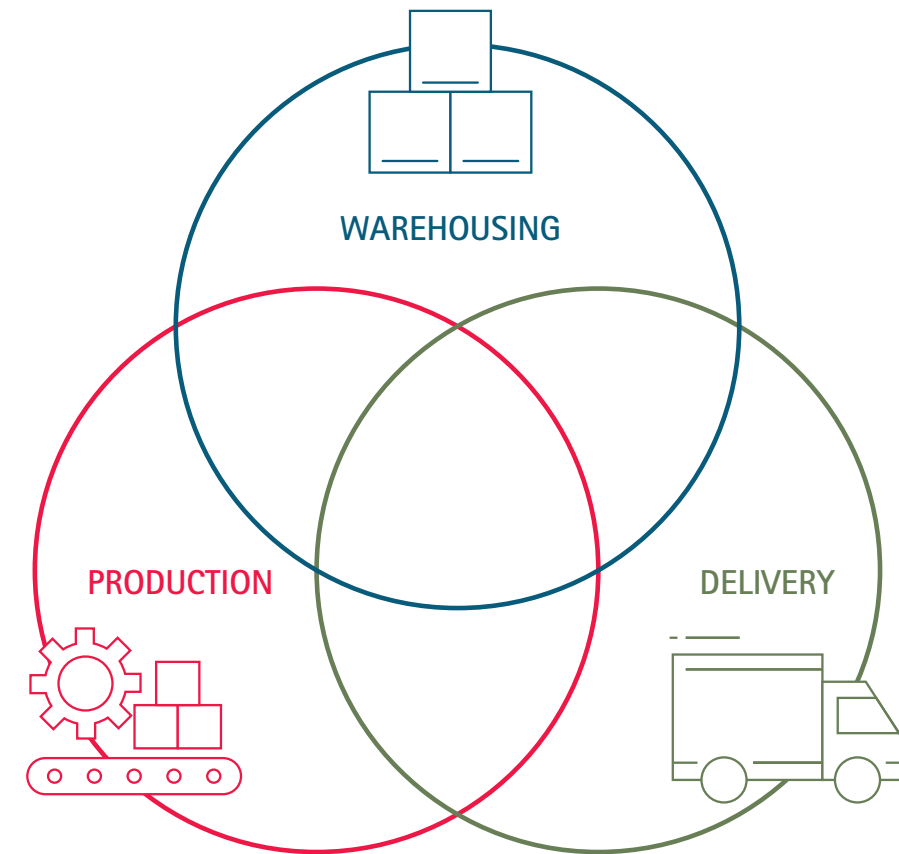
WAREHOUSING

PRODUCTION

DELIVERY

*The changes occurring in the warehouse today will need to extend upstream to production processes and downstream through last mile delivery.*

# › DIGITAL TRANSFORMATION AND DEMOGRAPHIC SHIFTS

## Responding to Demographic Changes

Supply chain and production managers can't afford to ignore the demographic and societal changes occurring globally. These include the aging of the population, the growing middle class in emerging economies and increased urbanization.
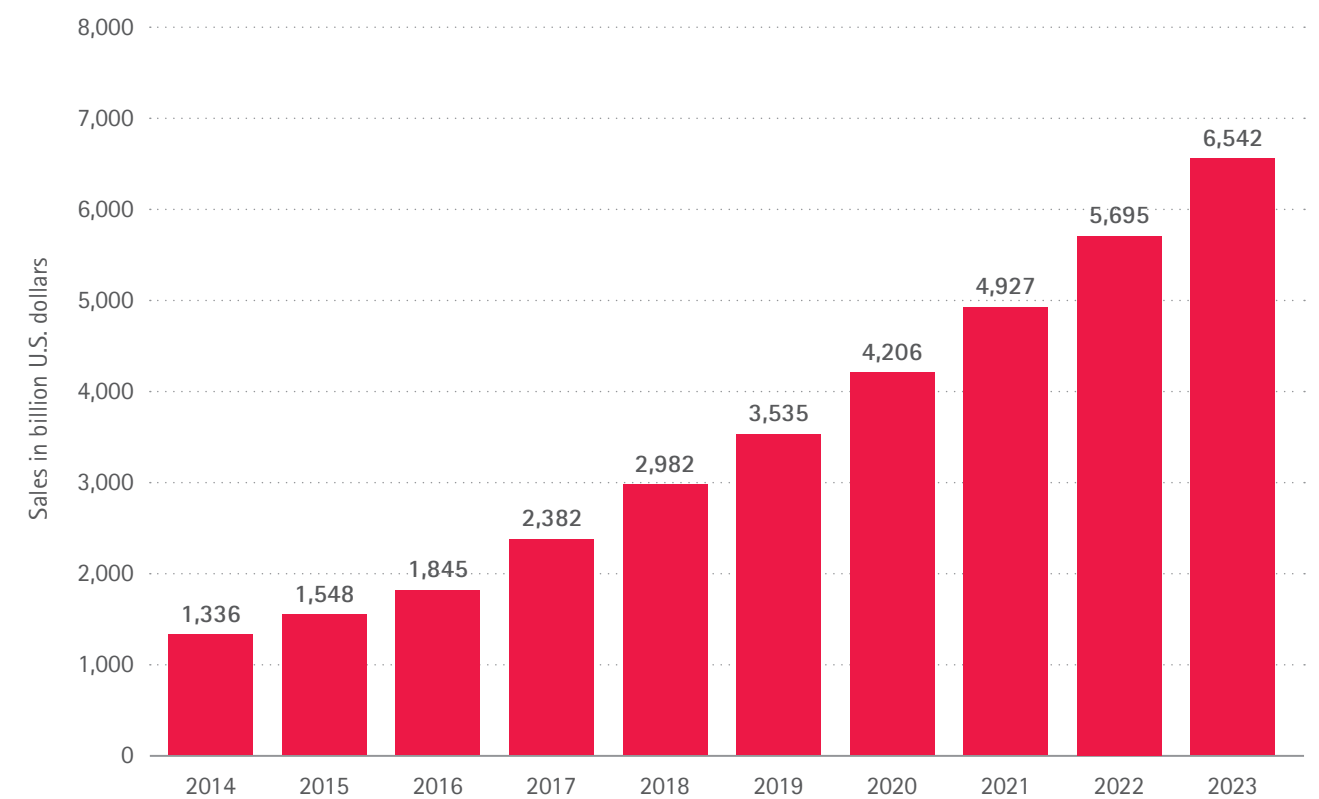
In the coming years, global demographics will change due to increasing life expectancy, declining fertility rates and rising levels of education. The number of people older than 65 is expected to double in the next 25 years, reaching 13 percent of the population around 2040. This will impact global productivity, personal savings and labor availability. It will also change consumption and spending behavior on a global scale, impacting production, logistics, warehousing and retailing.

At the same time, the middle class is expected to expand to nearly 5 billion people in 2030 at which time it will account for 60 percent of the world's population. Formerly poor populations, while still lagging behind developed countries, will have more purchasing power and greater access to information and communication technologies, which will create attractive markets for a variety of companies.

E-commerce and omni-channel retailing, which have already disrupted warehouse operations, could become even more important. Already accounting for 14.1% of global retail sales in 2019, e-commerce is projected to reach 20% of global retail sales by 2022.

### Projected Global E-commerce Growth



Source Statista

> *Supply chain and production managers can't afford to ignore the demographic and societal changes occurring globally.*

Finally, large cities will become more populated. In 2014, 54 percent of the world's population was living in cities; by 2050 it is expected to reach 66 percent. This will serve to consolidate markets and purchasing power but also create challenges in serving those markets as congestion and environmental concerns limit the ability of organizations to use last-mile delivery methods common today.

Those environmental challenges aren't limited to the last mile. According to a report by McKinsey, Starting at the Source: Sustainability in Supply Chains, "The typical consumer company's supply chain creates far greater social and environmental costs than its own operations, accounting for more than 80 percent of greenhouse-gas emissions and more than 90 percent of the impact on air, land, water, biodiversity, and geological resources."

As companies respond to the demand for smaller, more frequent shipments, this impact has the potential to grow and erode company value. New approaches are required to support direct-to-consumer business models that meet consumer expectations, reduce environmental impacts and adapt to major shifts in population and demographics.

## Digitalization Creates New Opportunities for Optimization

The other major trend to consider is technology-related: digital transformation. Digital transformation marks one of the most significant changes in business in recent years as organizations seek to harness digital technology and data to improve the customer experience and business performance. Encompassing people, technology and process, digital transformation can leverage a variety of technologies from cloud computing and big data to the IoT and automation.

One of the key objectives of digital transformation is to break down the digital siloes that exist in many organizations. This enables the creation of digital ecosystems that integrate internal and external connectivity.

Through digital transformation organizations are harnessing both historical and real-time (or near real-time) data to drive change in a host of business functions. It's no longer enough to have access to data; it's becoming imperative to be able to use that data to drive action.

Collecting, analyzing and using data across the business, as well as from partners and markets, fuels the insight that enables the shift from responding reactively to changes in demand and markets to proactively anticipating those changes. Likewise, equipment data can change the way production and supply chain environments are managed as the industrial IoT enables a shift from reactive to proactive maintenance and services practices, reducing downtime and costs.

*It's no longer enough to have access to data; it's becoming imperative to be able to use that data to drive action.*

## The Front Line of Change

The supply chain sits at the nexus of demographic and technological changes. It represents a key interface between a company and its partners and customers and is among the first areas of an organization to be impacted by changes in markets and business models. At the same time, its inherently distributed nature increases the challenges — and benefits — of connectivity and technology management.

This unique position means the supply chain must simultaneously adapt to digital transformation initiatives and shifts in consumer behavior and demographics. Key to its ability to accomplish this is **intelligent automation** and **process integration**.

# ❯ INTEGRATING PRODUCTION AND LOGISTICS

The changes occurring in technology and consumer behaviors create both opportunities and challenges for manufacturers, particularly in regard to the increased demand for customization.

In its most extreme, this trend is characterized as "batch size one"—customizing each product to the desires of an individual customer. Virtually every production environment will struggle to support this ideal at anything approaching series-production costs.

The objective, instead, is to shift to a model of customized mass production, which maintains overall plant effectiveness and product quality. Accomplishing that requires integrating intelligent automation solutions and adopting a more global outlook that encompasses people, technology and process.



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## Automation Enabling Flexibility

Automation enables extremely versatile production, which can be networked throughout the entire process chain. As production technologies continue to evolve they can significantly enhance the capabilities of production employees, minimizing the impact of labor shortages created by an aging population, and enabling shorter production runs without sacrificing efficiency.

Smart technologies support people by opening new ways of working and exploring new applications, thereby enabling more efficient manufacturing with higher quality and improved ergonomics. Ground-breaking, flexible production technologies, such as robotic manufacturing lines, matrix production and mobile platforms, are creating a wide range of new production applications that will enable organizations to adapt to changes as they occur.

In addition, technical assistance systems, such as collaborative robots (cobots), augmented reality and virtual reality will become increasingly valuable as everyday factory assistants.

Data-driven technical assistance is changing the way we work.

## The Human-Machine Integration

The positive effects of flexible and networked machinery and systems can only be tapped in their entirety if the interface between people and machines enables the understanding and use of complex technologies intuitively. Human-machine interfaces – whether for programming, commissioning, operation, analysis or servicing—must be simple and intuitive.

The evolution to more adaptive production also requires that operational technology (OT) be combined with information technology (IT) to push back the existing boundaries of production systems.

OT is hardware and software "that detects or causes a change through the direct monitoring and/or control of physical devices, processes and events in the enterprise." Working in conjunction with IT-driven developments, such as artificial intelligence, big data and cloud platforms, OT can transform the entire supply chain to form a new, interactive, global network.

Supporting this evolution will require increased automation in intralogistics processes as manufacturers face the reality that further investments in manufacturing automation will not pay dividends unless intralogistics processes are addressed.

Using a range of proven material handling solutions, production environments can adopt modular and robotic systems that deliver better process control and visibility upstream and downstream from production, optimized inventory levels and increased production capacity.
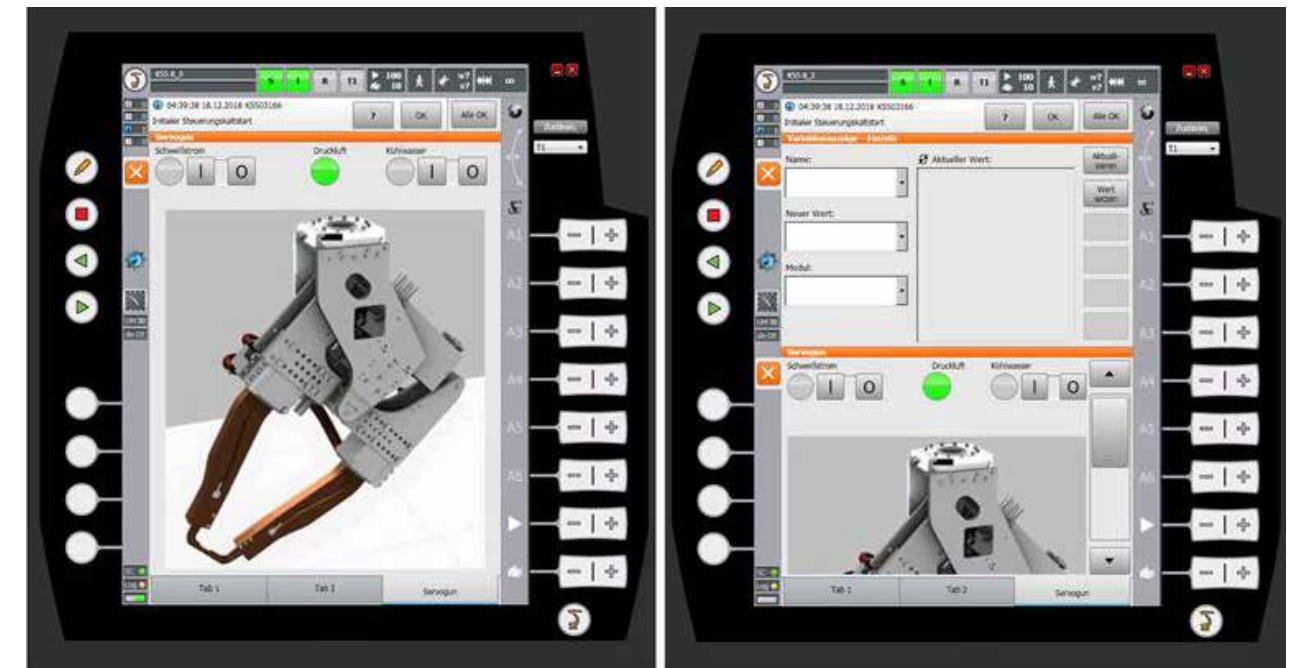


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## Software-Enabled Connectivity

These production intralogistics systems become even more valuable when the software platforms used in material handling environments can be extended to intralogistics systems in production environments while also enabling easy integration to production management and other business systems through standard APIs.

Consequently, intelligent software will be the key to success when it comes to creating smart networks and to effectively integrating all the systems involved. It will not only enable greater integration across business systems, but will provide the ability for production and logistics systems to become self-learning and continue to improve their performance autonomously. This capability will be enabled by a combination of technologies, including machine learning, predictive processes, augmented reality, and virtual reality.

## An Agile, Intelligent Future

With globally networked production locations and supply chains that leverage these technologies and strategies, organizations can adapt to the increased distribution of economic power over more countries and regions and changing customer behaviors. Customization then becomes about catering to specific regional customer requirements in an economical and timely manner.
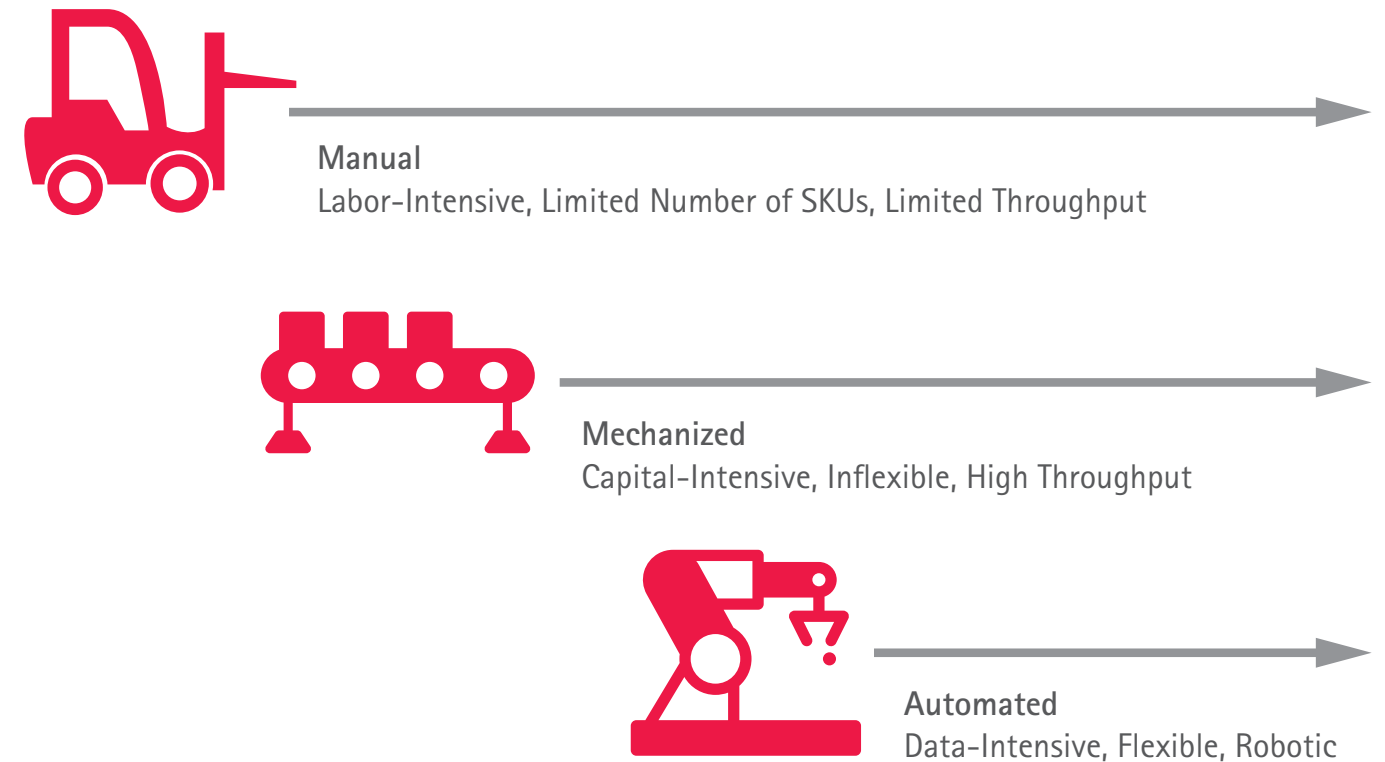
# THE NEXT PHASE IN THE EVOLUTION OF THE WAREHOUSE

For years warehouses were largely manual operations, relying on little more than forklifts and people to receive, store and ship products. These labor-intensive operations typically had to manage a much fewer number of products and lower customer expectations than current warehouses.

Then, as the number of SKUs increased and the need for speed and efficiency grew, warehouses entered the age of mechanization. Mechanized sortation and conveyor 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.

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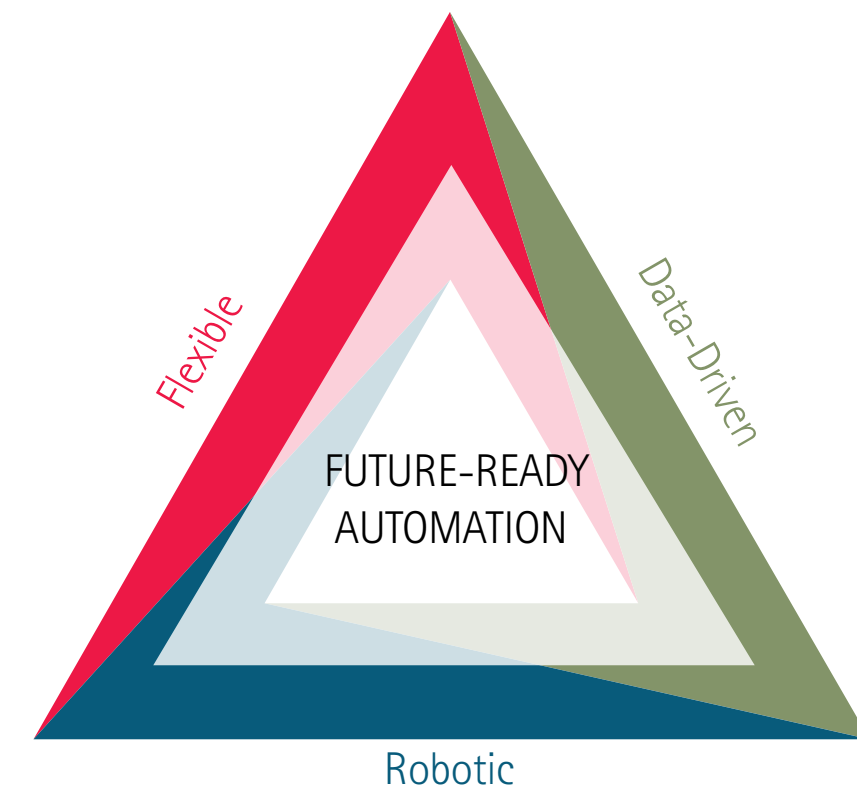
EVOLUTION OF THE WAREHOUSE

**Manual**
Labor-Intensive, Limited Number of SKUs, Limited Throughput

**Mechanized**
Capital-Intensive, Inflexible, High Throughput

**Automated**
Data-Intensive, Flexible, Robotic

The next phase of warehouse evolution, which has already begun, addresses these challenges directly. As with the technological changes occurring in production environments, the new generation of warehouse technology is marked by automation that focuses on intelligent systems that enhance an organization's ability to adapt to change by being **data-driven**, **flexible** and **robotic**.

## Data-driven

Data is a powerful tool in supply chain management, but one that is only beginning to be harnessed. From bar codes on products to sensors on equipment and vehicles, 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. Not only is data siloed between production and the supply chain that supports it, but within the supply chain itself.

Flexible

Data-Driven

FUTURE-READY
AUTOMATION

Robotic

*The key to harnessing the power of warehouse data lies in warehouse management and execution software.*
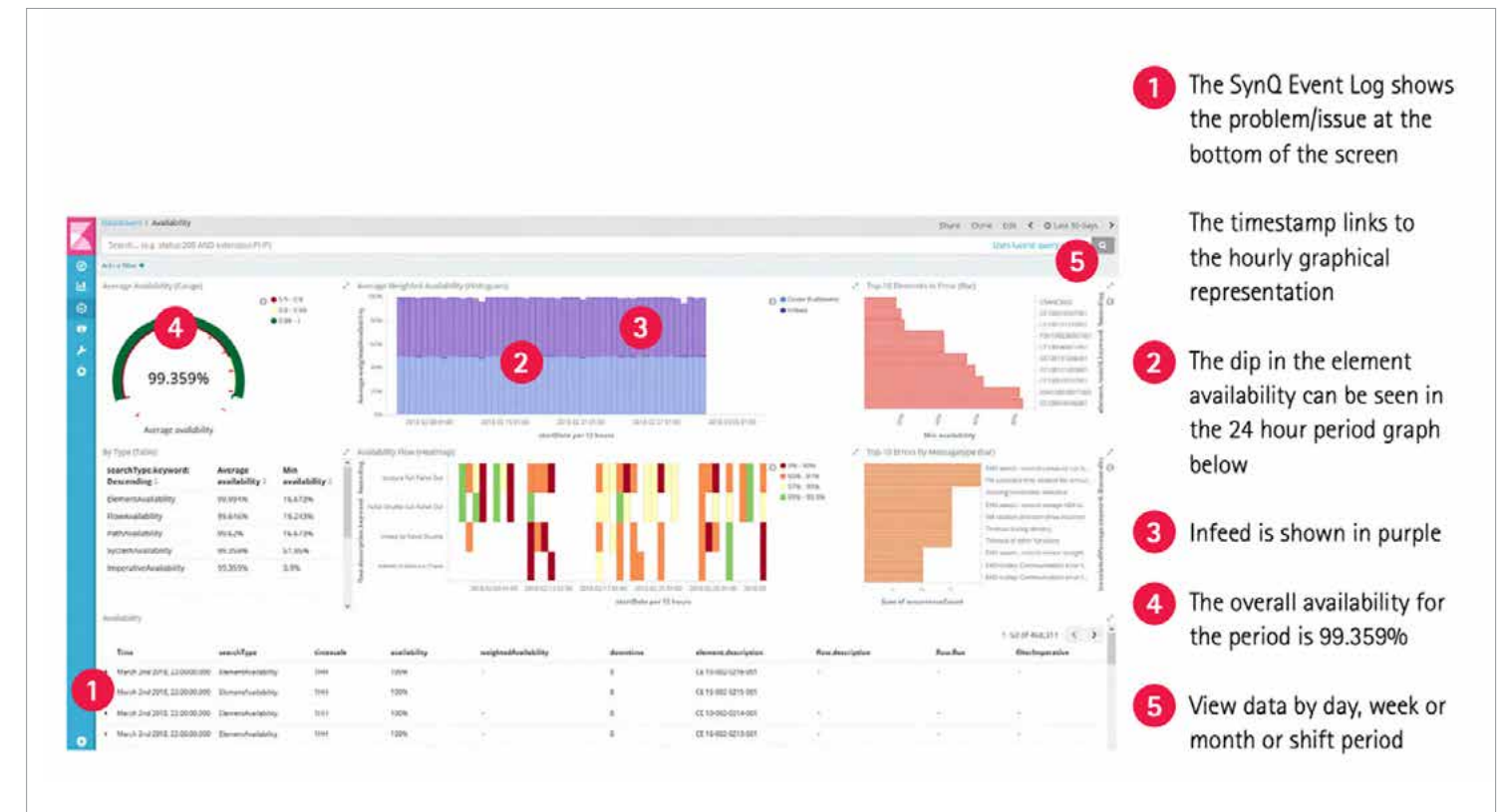
The new generation of warehouse management software, as exemplified by Swisslog's SynQ system, integrates these various warehouse functions into a single platform to unleash the power of your data.

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. These capabilities are especially critical in peak periods where unexpected downtime can prevent an organization from meeting customer expectations and irreparably harm customer relationships.

Another example is SynQ's Visualization Manager, which uses real-time data from system equipment and product elements, along with the geometrical 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.

Swisslog will further enhance user experience by enabling operational teams 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.



1. The SynQ Event Log shows the problem/issue at the bottom of the screen

   The timestamp links to the hourly graphical representation

2. The dip in the element availability can be seen in the 24 hour period graph below

3. Infeed is shown in purple

4. The overall availability for the period is 99.359%

5. View data by day, week or month or shift period

*Managers can get a comprehensive, real-time view of processes to monitor products as they move through the warehouse and optimize performance and efficiency.*

Data is also the fuel for the artificial intelligence systems that will enable logistics systems to learn and evolve on their own. Through the power of data and artificial intelligence, supply chain systems can learn to recognize patterns, regularities, and interdependencies from structured and unstructured data to anticipate demand and adapt, dynamically and independently, to new situations. Working with similarly intelligent productions systems, these self-learning supply chain systems will enable organizations to meet global customer requirements with greater speed, customization and efficiency.

## Flexible

The mechanized warehouse delivered the throughputs many warehouse operators required but lacked flexibility and, as a result, was often outdated before a return on investment could be realized. The current and future generations of warehouse automation, such as AutoStore and CarryPick, eliminate this limitation through solutions that are easier to deploy, modular and repurposable.

AutoStore uses robots and bins to quickly process small parts orders through goods-to-person or goods-to-robot picking. It optimizes space utilization through a unique grid 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 naturally moves faster moving products to the top of the grid to decrease picking times. Modular and scalable, AutoStore  can adapt to change by adding storage modules, robots or pick stations, providing a high degree of flexibility.

Swisslog is the world's leading AutoStore integrator with over 160 deployments across 19 countries.

[
*Modular and scalable, AutoStore can adapt to change by adding storage modules, robots or pick stations, providing a high degree of flexibility.*
]

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. As the prices of these mobile robots continue to decrease, it will become feasible for organizations with large upticks in throughput, such as those experienced during the holiday shopping season, to maintain a reserve supply of robots that can be quickly deployed when demand peaks.

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.

Warehouse software that integrates multiple automation control systems into a single platform also increases flexibility by reducing deployment times and costs and eliminating data silos within the warehouse.

Swisslog's CarryPick mobile storage and picking system delivers racks of products.

*The intelligent robots require no physical changes to the warehouse so additional robots can be added at any time to meet increased throughput requirements.*

## Robotic

Automating storage and retrieval through systems such as AutoStore and CarryPick represents just one of the opportunities for robots 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.

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 ItemPiQ and ACPaQ.

ItemPiQ is a robot-based piece-picking solution capable of delivering accurate and flexible picking performance while providing the basis for future-proof intralogistics. With higher speeds and improved gripping systems, ItemPiQ is now proving its value in standalone applications and when integrated with other automation systems such as AutoStore. Since ItemPiQ and AutoStore are both controlled by the SynQ platform, they work together seamlessly. As machine learning continues to evolve and is integrated into platforms such as SynQ, the performance of these systems will continue to improve.

ItemPiQ picks single items efficiently from a source bin into target bin or carton.

*ItemPiQ is now proving its value in standalone applications and when integrated with other automation systems such as AutoStore.*

ACPaQ provides a similar function for mixed case palletizing. This system automates the task of building store-friendly pallets by combining light-goods shuttle systems, conveyors and high-performance de-palletizing and palletizing robotic technology.

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.

## Smarter, Faster and More Efficient

As in the production environment, future-ready automation systems support a highly productive, steady pace of work, while also removing some of the most physically demanding and repetitive tasks from human workers, and, most importantly, are flexible and intelligent.

ACPaQ offers fast and efficient palletizing in automated distribution centers.

# THE URBAN DISTRIBUTION CENTER

The modular and adaptive technologies described in the previous sections have emerged to enable organizations to better manage increased supply chain volatility and customer expectations that have accompanied the growth in e-commerce and other related developments.

## Getting Closer to Customers

Yet, ultimately optimizing operations within the warehouse will only prove to be part of the solution. Because of increased urbanization and the growing expectation for same-day delivery of almost everything, it is becoming necessary to rethink not only how warehouses operate but where they are located. Moving storage and fulfillment closer to customers while maintaining the agility to quickly relocate those functions as market demand shifts or supply chain needs change will be an essential characteristic of the supply chain of the future.

This will mean regional warehouses will need to be supported by a network of smaller warehouses located close to the customer being served, particularly in large, densely populated urban environments.

> *Because of increased urbanization and the growing expectation for same-day delivery of almost everything, it is becoming necessary to rethink not only how warehouses operate but where they are located.*
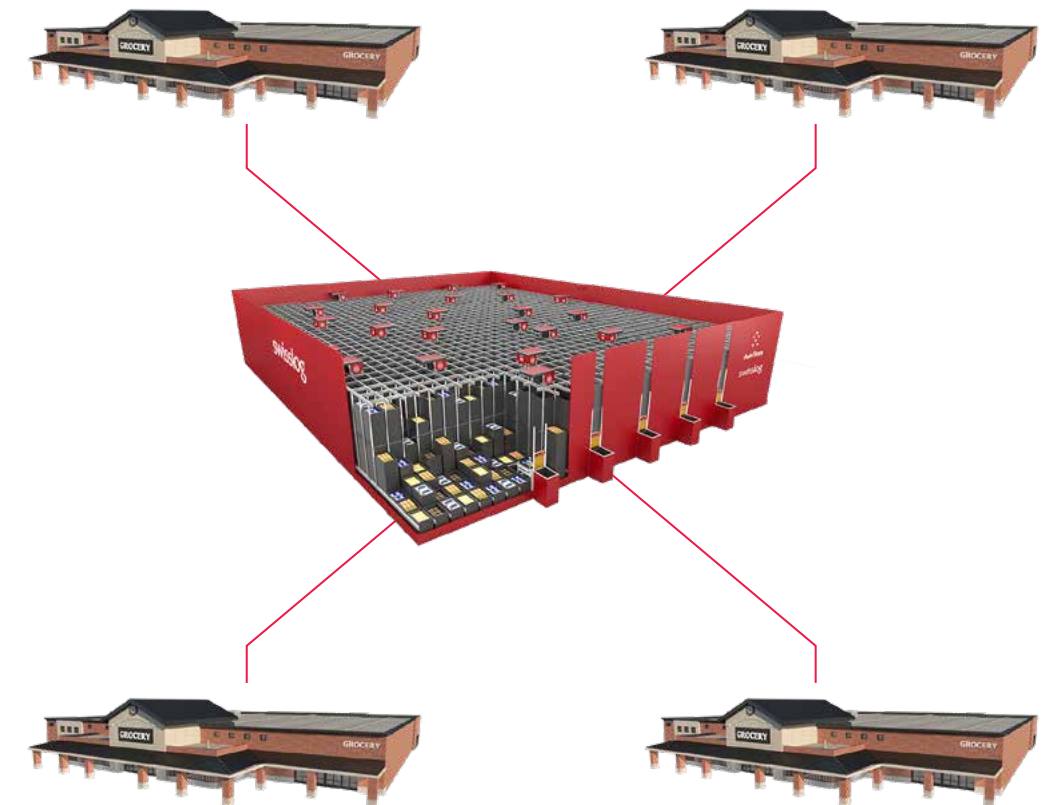
## Maximizing Real Estate

Because of the scarcity of real estate and high land prices in these urban areas, it won't be possible to simply shrink a regional warehouse design to fit the available footprint of the area. The design, management and operation of these urban distribution centers must be customized to their location and their role in the supply chain.

The urban DC will need to hold some inventory; however, this inventory will likely be limited. In principle, smaller items, and products that are sold regularly would be held in stock. Inventory size would be minimized through 3D printing and use of big-data to predict behavior and distribute articles to the urban DC just before they are ordered.

It's also likely some organizations will move to multi-story warehouse designs in densely populated urban areas to maximize inventory within the available footprint. This trend, which is already common in Asia because the smaller trucks used there can more easily navigate to upper levels of the warehouse, is now migrating to the U.S. and other areas of the world.



Image courtesy of 640Columbia.com

> *Because of the scarcity of real estate and high land prices in these urban areas, it won't be possible to simply shrink a regional warehouse design to fit the available footprint of the area.*

Multiple planned developments in New York City are adapting the Asian model to accommodate the 53-foot trailers common in the U.S. If these developments prove successful, the multi-story warehouse could become common in urban areas. In fact, in a paper published in 2019, JLL notes that investors, including DHPH, Goldman Sachs and Bridge Development Partners see multi-story developments as "the next steps in urban logistics."

As with single-story urban distribution centers, these multi-story facilities will be automation-dependent to deliver the speed and efficiency required to serve urban markets.

## New Business Models and Emerging Technologies

It may also be necessary for multiple organizations to share space in a single facility, forcing partnerships between potential competitors based on the limited resources available and the shared objective of enhancing customer service.

An order picking process, using the automated picking systems described previously will also be required. Because the urban DC could support multiple sellers in a shared service model, this creates the opportunity to consolidate articles from different sellers into one shipping carton for a common customer to reduce shipping costs and streamline last-mile delivery.



Image courtesy of 640Columbia.com

The urban DC is well-positioned to consolidate pre-picked parcels coming from multiple sellers or parcel companies into one last-mile transport to the consumer. Functionally, this is no different from the many parcel sortation hubs that exist today In today's networks, companies like DHL, UPS and FedEx do their own sortation and last mile transport for their customers. Depending on the willingness of various e-commerce companies to partner, the future urban DC could consolidate flows from multiple companies.

Online marketplaces will need to be employed to manage supply and demand among sellers vying for space in the urban DC, allowing sellers to balance their costs against the need for delivering very quickly. This will reduce the number of distribution centers within a particular city, maximize space utilization and limit the environmental impact of last mile delivery.

Big data and smart, self-learning analytics, enabled by integrated supply chain platforms will be able to predict what consumers will be ordering to minimize inventory; however, the predictions will not always be correct, and that will create additional product movements. Technology advances, such as self-driving trucks and robotic loading and unloading systems, will minimize the costs of those movements.

Finally, new approaches to building infrastructure will need to be developed to provide urban distribution centers with greater mobility and flexibility than traditional structures can deliver. These are discussed in the next chapter.



*The urban DC is well-positioned to consolidate pre-picked parcels coming from multiple sellers or parcel companies into one last-mile transport to the consumer.*

# ❯ THE EMERGENCE OF NEW STORAGE CONCEPTS AND MULTI-LEVEL WAREHOUSES

A new more flexible and mobile way to support localized distribution is now in the early phases of development and shows promise for meeting the demands of the future.

The building block for this solution is the standard shipping container. These durable and versatile structures, developed as standardized transport units for overseas shipping, have been used as foundational infrastructure for everything from temporary school buildings to permanent homes and offices.

Now, it's time to put them to work as the infrastructure for supply chain applications that require modular, easy-to-deploy and automated material handling.

When integrated with powerful material handling technology, and controlled by the Swisslog SynQ WMS, these standardized container-based solutions bring greater flexibility to network design, provide the ability to dynamically manage inventory and allow fulfillment services to be positioned in close proximity to customers.

# ❯ MANAGING THE LAST MILE

The challenge of the "last mile" remains one of the most difficult for the supply chain of the future. We are almost certainly moving to a standard expectation of same-day delivery and with increasing urbanization and the congestion and environmental challenges it will bring, last-mile delivery must continue to evolve in the same way as other supply chain processes.

The urban DC described previously will be an important component in meeting this challenge as it not only moves products closer to consumers but through its shared-service model could enable consolidated packages that reduce the number of deliveries.

## New Delivery Methods

New delivery methods will also need to be explored, such as autonomous vehicles and drones. Electric, and potentially driverless vehicles could replace the familiar delivery van. Loading such a vehicle efficiently requires that a high number of parcels be loaded simultaneously in as short as time as possible. Very likely some kind of drop-sequence will be required for that as well. This could create the need for standardized loading modules where parcels can be staged before the vehicle arrives and loaded into the vehicle "in one go." Inside the vehicle, there may be a form of automated handling, presenting individual parcels to the driver.

Parcel-drones or small autonomous vehicles could accomplish this. These methods will require different loading processes, since each vehicle will only be loaded for one stop. The warehouse will need a series of small "docks" for these vehicles, and a way of automatically loading into the drone or vehicle.

Finally, automation solutions that support customer pick-ups and drop-offs at highly localized hubs will be necessary to support increased dependence on these methods.

## Convenient Consumer Pickup

To support customer pickup, which is emerging as a viable alternative to delivery, the urban DC will require a "parcel station" similar to those used by overnight shippers today. But, being located within an automated warehouse, it will allow for automatic loading of individual lockers, from which consumers would receive their purchase from the back.

Mobile pickup points would be filled quickly with multiple parcels at the urban distribution center and then driven to a spot even closer to the consumer (e.g., shopping mall parking lot) where consumers would pick up their parcels.

## Micro-fulfillment Centers

The shifts in the retail landscape created by e-commerce have created opportunities to convert retail outlets into micro-fulfillment centers that serve the same area as a traditional grocery store with automated fulfillment for curbside pickup or home delivery.

This strategy sacrifices in-store shopping so is particularly attractive to pure-play e-grocers but creates the opportunity to optimize the environment by efficiently integrating automated and manual picking. It allows grocers who don't have an existing brick-and-mortar footprint within a particular area to move fulfillment closer to customers to reduce transportation costs and enable shorter delivery times.

# MOVING TOWARD AN INTEGRATED, CONNECTED FUTURE

The challenge of the "last mile" remains one of the most difficult for the supply chain. The evolution that will create dramatic change in the supply chain has already begun but more change is on the way. The challenge for supply chain managers is making decisions today that will maximize their ability to leverage future developments.

Organizations that can adapt efficiently and cost-effectively to this evolution will be able to reduce costs and improve service through a more intelligent and integrated supply chain.

**Swisslog and KUKA are committed to delivering future-ready automation solutions that enable this evolution.**

| HAPPENING TODAY | THE NEXT PHASE | ON THE HORIZON |
| --- | --- | --- |
| Warehouses and production environments implement **flexible, robotic and data-driven automation** that increases productivity and process efficiency. | **Container-based solutions** accelerate the expansion of the distribution network into urban areas and underserved rural areas to meet customer expectations for faster delivery. | New last-mile delivery methods, such as **drones and autonomous vehicles**, become available to better manage growth in direct-to-consumer deliveries. |
| Warehouse management software has become more intelligent and integrated to enable **condition-based monitoring** and break down data silos within the supply chain and between production and logistics. | Artificial intelligence and machine learning are integrated into warehouse management software to enable automation systems to **learn on the fly and self-optimize**. | **3D printing** is integrated into urban warehouses to supplement inventory with products manufactured on demand. |
| Advances in robotics are enabling increased use of **item-picking robots** in the warehouse. | **Predictive analytics** is employed to better forecast market demand and improve inventory management. | Robotic technologies are implemented across the supply chain, including the last mile, to **automate vehicle loading and unloading**. |
| **Urban warehouses** are being planned or developed in select markets | Manufacturers ramp up their ability to **efficiently customize products** to regional and local preferences. | Inventories from multiple sellers are consolidated into **shared use facilities**. |

# ❯ ABOUT SWISSLOG LOGISTICS AUTOMATION

We shape the future of intralogistics with robotic, data-driven and flexible automated solutions that achieve exceptional value for our customers. Swisslog helps forward-thinking companies optimize the performance of their warehouses and distribution centers with future-ready automation systems and software. We are the world's leading integrator of AutoStore with more than 160 deployments worldwide. Our integrated offering includes consulting, system design and implementation, and lifetime customer support in more than 50 countries.

Swisslog is a member of the KUKA Group, a leading global supplier of intelligent automation solutions with more than 14,000 employees worldwide.

For more information, contact logistics@swisslog.com.