

Intralogistics – optimizing the movement of goods and data through buildings and processes



Automation in the supply chain is not new – transport, logistics, manufacturing, warehousing, retail and healthcare have all been automated for years. So, what is changing?

Digitalcommerce360.com estimates that American consumers spent \$861.12bn online with US merchants in 2020 – up an incredible 44% year on year*.

Intralogistics refers to the Organization, control, implementation and optimization of the internal flow of materials, the flow of information and the handling of goods in industry, retail and public facilities.

- VDMA, the Materials Handling and Intralogistics Association*

Introduction

Businesses and organizations have been gradually moving towards greater automation for some time, digitizing their processes to achieve better competitiveness, cost control, and to reach new markets. They also want to use power and fuel more sustainably, and reduce the waste released into the environment.

These two trends were already driving change in the supply chain and materials handling functions. Then the Coronavirus Pandemic hit and forced organizations to transform the way they move goods around in a matter of weeks.

Businesses had to re-design many of their processes. Some needed to adapt to maintain business as usual, others – particularly retailers – needed to transform just to survive as shoppers wanted groceries and supplies brought directly to their homes. Accordingly, retailers and their supply chains shifted their focus to enable online ordering and delivery.

Manufacturers, already responding to Brexit, are also adjusting to new patterns of supply, transport and distribution.

Health authorities, with their complex supply chains, operate very much like large businesses, and need to do more with less – treat more patients, instigate widespread test and vaccination programs, and manage with fewer staff.

Everywhere, there is pressure for efficiency, to get work done whatever, to compensate for the changes and the economic fallout of 2020. Speed and productivity matter more than ever: moving and receiving goods, putting-away stock accurately, shortening sorting and loading times, enabling faster distribution. Mobile computers and scanners speed up these processes, and every small improvement makes a difference

Four critical business goals

Intralogistics has become a new science where processes are optimized for efficiency. Businesses, particularly manufacturers and retailers, and health authorities that buy and store high value supplies for patient care, are all looking to automation for greater efficiency, improved reliability and fewer errors.

The most pressing concern is to compensate for the unforeseen costs of Coronavirus and make up the financial shortfall.

The Pandemic has taught some tough lessons. Organizations realize they face new risks they had not previously foreseen – and that they must be more agile in case of another crisis, whether it is a health emergency, environmental or political, as with Brexit. At the time of writing, workplaces are following national guidelines on sanitizing and social distancing, to keep employees safe from Covid-19.

This translates to four critical business goals:

1. **PRODUCTIVITY** - to optimize the use of machinery, vehicles and human resources
2. **FINANCE** – to control costs, running costs and inventory
3. **MARKETING** – to win by being faster to market and providing better customer experience
4. **AGILITY** – to be ready to respond to future change

What does this mean? It means taking a new look at business processes from end to end, to be sure that they are robust, accurate, efficient and ready for the new, post-pandemic era.

It means re-examining every stage in the logistics journey, in manufacturing, warehousing, retail, fulfilment and distribution. Each step needs to be visible and efficient: goods in, data-capture, high-speed sorting, palletizing, assembly line, labelling, order picking, verification of parcels, shipping, loading to vehicles and handover to the final customer. These processes need to be flexible so that employees and their equipment can be relocated to different position if a process should change.

We see that Organizations in all market sectors are optimizing their logistic processes to achieve these goals.

Manufacturing

Apart from small craft industries, most manufacturing is automated in the western world. The next step for manufacturers is to move towards end-to-end automation and Industry 4.0.

Most use barcodes to manage inventory, to help them locate components and track assembly. The data they capture from barcodes helps them to achieve right-first-time quality, and handle recalls more efficiently if there should be a product issue.

They can enhance quality through better visibility and traceability. This also helps them to comply with legislation and standards. They can use machine vision, OCR and handheld scanners to check goods throughout production, and capture batch codes, manufacturing dates, and origins.

Manufacturers want to optimize for efficiency, increase capacity and throughput, and save energy. Integration is the key to efficiency, so manufacturers are linking their factory systems to their trading partners and suppliers. They can interface their ERP, QA and traceability systems together, to help speed up projects and processes

Storage and distribution

Supply chains are changing. Brexit is changing processes. Supply chains can be reconfigured. Some automated warehouses are now extremely large. New analytics and AI (Artificial Intelligence) are helping companies to make better informed decisions and serve their customers better.

With risks from pandemics, disasters, political change and supply threats, companies must ask whether their existing materials handling system is fit for purpose?

“The advancement of technologies such as artificial intelligence, computer learning, sensors and analytics has created a buzz about the potential of smart factories across the manufacturing world. More and more factories are moving beyond traditional automation to a fully connected and flexible plant, using a constant stream of data from connected operations to learn and adapt to new demands.” (Forbes*).



EY wrote*: *“most companies lack end-to-end visibility in the supply chain to effectively reduce costs and risks.”*

In practice, this means checking goods in accurately, in real time, recording exactly where they are stored, and checking them out again for delivery. Companies use barcode labels and handheld scanners to capture data and manage the whole process: receiving goods, storing them, order processing and picking, checking out, loading vehicles and stock-taking.

Gartner*: *“Companies utilizing technology in supply chain risk management increase their effectiveness in supplier risk tactics by almost 2x.”*

Retail

Consumers’ expectations of retailers have changed. They now expect quicker fulfilment of orders, better service at in-store service desks and faster deliveries to their homes.

Retailers’ response has been amazing. Many adopted e-commerce intensively and adjusted to new patterns of shopping during 2020. They have added self-service machines and contactless payments.

Behind the scenes, they are sorting items faster on conveyor belts, and tracking pallets to where they are stored. This means that automated picking becomes possible. Order fulfilment can use robots to process orders faster, and quick barcode scans confirm when an order is handed over. Even the final drop-off is logged and recorded by the delivery driver.

Retailers are also processing more returns. Where the volume is high, these too can be automated using machine vision and high-speed sorting in automated warehouses.

Gartner on retail*: *“Covid forced digital transformation at an unprecedented rate, by some estimates fast-forwarding consumer and business digital adaption by 5 years in 8 weeks.”*

We do not expect operations to return to how they were. Retailers will continue to use technology to optimize their processes and improve customer experience. They will strive for better use of inventory, steady margins and to provide a better customer service.

Healthcare

The crisis of 2020 has stretched healthcare services to their limits. Health logistics are already automated for accuracy and productivity. For example, hospitals use barcoded wristbands to check patients’ ID and verify that they receive the correct treatments. Healthcare inventory is tracked – to monitor high value assets, hospital supplies and pharmaceuticals, and keep inventory up to date.

In pharmaceuticals, the implementation of the “Falsified Medical Directive” has accelerated the use of technology. Manufacturers use vision systems with 1D and 2D labelling for quality assurance. They track batch numbers, manufacturing dates and expiry dates. They can log supplies by pack, carton or pallet. The same codes are read again in the pharmacies dispensing the medication.



Scientific laboratories use machine readable codes to label test samples and process them efficiently and anonymously. With pressure on health services to do more with less, all improvements in efficiency will make a difference.

Even though each industry has its specific needs, they all share the same challenges:

Efficient and precise process flow in all intralogistics areas:

Today, when managing any type of goods or data the magic word that everybody knows is traceability. All items and data that are handled need to be seamlessly identified and traceable throughout the entire value chain. To identify parts, goods or packages there is several solutions and sometimes finding the right one is difficult:

Hands-free stationary scanner solutions for order fulfillment

Hands-free solutions are more suitable for Goods-to-People (GTP), because they are based on a fixed positioned bar code reader that allows the operator to fully focus on order creation and capturing the data content of the items in a seamless way. Hands-free solutions are 100% contactless, since the goods are read “on the fly” while fulfilling the order.

The fact that there is no need to handle the devices repeatedly makes operations much safer, especially at a time when it is strongly advisable to touch shared surfaces as little as possible: the issue of disinfecting the devices is avoided. The fixed position means there are no cables and no cradles to deal with.

Hands-free solutions have many other advantages in terms of improving business processes. For example, the mountings help the operators become more productive because there is no interruption in their movement and no time wasted picking up the device and aiming at the label to read it.

Moreover, depending on the dimensions and type of items to be identified, the hands-free solution can be adjusted to suit the operator and allow them to work more comfortably and more productively. With just a few models it is possible to provide solutions for many different situations, as most of the parameters are software controlled and can easily be adjusted. It is easy to implement hands-free solutions in most of areas of a logistic center.

Hands-free wearable solutions

Depending on the application, the key benefit of using a wearable hands-free solution is its ease of use. Users can easily pick up heavy or bulky items with both hands, wearing the hands-free scanner like a glove. This ensures fast data capture, hence increasing productivity while reducing unnecessary, repetitive tasks and associated errors.

Mounted comfortably and ergonomically on the back of the hand, the solution is thinner and less intrusive than traditional ring mounted scanners. It frees the user’s hands for all manner of operations and is far more resistant to damage than traditional bulky, finger mounted scanners.



Additionally, combining such a solution with a mobile computer, further enhances worker productivity with full data collection capability suitable for any kind of application. With their light weight, fast scanning, long battery life, quick charge capability and unique notification features, these types of products help users to maximize the efficiency of their operations with a quick return on investment.

Dimensional Weighing Systems for efficient shipping

Many companies are using data such as sizes and weights of packages to manage and optimize their shipping costs. The actual process of measuring and weighing can either be done manually or by fully integrated automatic solutions.

The advantage of such automation is clearly increased speed and precision. These systems combine camera technology with dimensioning and weighing systems and the three parameters are calculated in fast and seamless way. When an item's weight and dimension are used to charge the customer, these systems are LFT (Legal For Trade) DWS (Dimensioning Weighting Scanning) systems. Datalogic is a certified vendor for LFT DWS systems.

Camera solutions for packaging control

Camera technology is widely used in many logistic fields, such as following the packaging process from start to finish, through production up to delivery in the store. The advantages of an image-based technology, beside the capability to read 1D and 2D barcodes, are related to the image capture. These images can be stored as POD (Proof of Delivery) or can be used as further decoding processes like OCR (Optical Character Recognition).

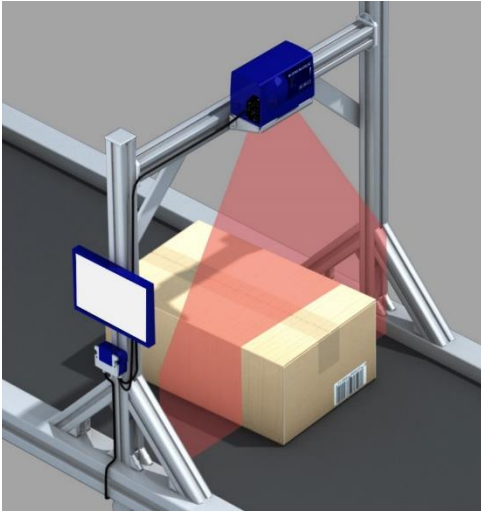
User friendly and safe working environments:

When moving items from one place to another the environment changes and so do the working conditions. Depending on the applications, the changes might be dusty or dirty environments, cold storage, high-rack-warehouses or movement of pallets. Solutions need to be flexible to ensure that users can rely on easy-to-use technology in all these environments.

Mobile Computers

Mobile computer solutions offer the greatest flexibility for warehouse applications where mobility is required combined with robustness and ergonomics. Operators can choose from different form factors ranging from devices with or without a pistol grip up to different keypad layouts and display sizes. In addition, devices with Auto-Range functions enable operators to read codes from a long distance. This is especially useful in high-rack warehouses.

To offer users the benefit of a familiar and hence easy to use environment, today's operating systems are based on Android. Thanks to the unique wireless charging technology that is only available in Datalogic's mobile computers, enterprises can easily lower their Total Cost of Ownership (TCO) because repair, maintenance and changing of battery contacts are no longer needed.





Smart Forklift Solutions

Tailored for warehouse management solutions, vehicle mounted computers are considered to be the most robust and user-friendly solutions for applications on forklifts. They offer the benefits of the big 10" or 12" screen, and a sealed design with IP65/IP67 protection. For applications in cold-storage environment there are special models with integrated heater systems. To make them easy to use, operators can also use them when wearing gloves. If they are used in combination with an auto-range hand-held-scanner the driver does not have to leave his vehicle to manage materials. They come with a choice of operating systems such as Windows Embedded Compact 7 (WEC7), Windows Embedded Standard 7, Windows 10 IoT Enterprise and the new Android™ 7.1.

Margins of efficiency

The challenges of intralogistics are the same everywhere - how to capture data faster, track goods more easily, and then use that data to achieve measurable efficiency?

Datalogic's latest data capture devices are designed to enhance efficiency in any work environment - manufacturing, warehousing, retail or healthcare. The latest scanners and barcode readers bring new features:

- Long range scanning for high warehouse pallets
- Readability of 1D and 2D barcodes on various surfaces
- Higher read rates for barcodes, even if badly printed
- Multi-sided reading, for codes on the top, side or bottom of an item
- IP65 and IP67 rated scanners for harsh environments
- Wireless devices for mobile working

Datalogic also brings the benefit of many years' experience in automation and data capture.

Scanners and machine vision tools are not enough on their own, they require integration with corporate databases, documentation and the wider IT ecosystem. Datalogic offers these services through a community of partners who bring deep expertise in their market sectors: manufacturing, retail, transport and logistics, and healthcare.

* Sources

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About Datalogic

Datalogic is a global technology leader in the automatic data capture and process automation markets since 1972, specialized in the designing and production of bar code readers, mobile computers, sensors for detection, measurement and safety, machine vision and laser marking systems.

Datalogic S.p.A. is listed in the STAR segment of the Italian Stock Exchange since 2001 as DAL.MI.

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