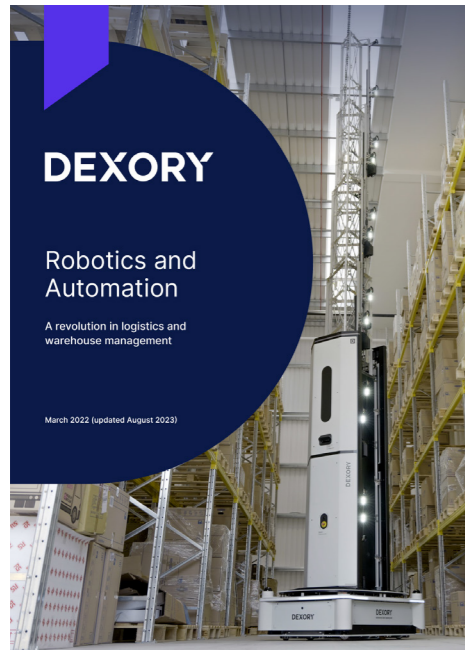


18-page digital and printed guide Dexory



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1 Executive summary

In the 2021 World Robotics Service Robots Report published by the International Federation of Robotics (IFR), the logistics and warehousing sectors are reported to be seeing a boom in autonomous mobile robots (AMR). Robots are changing the way the industry operates - improving efficiencies and sustainability, and making work safer and more rewarding in a wide range of roles across the industry sectors.

In warehouses, robots are used across all stages, from receiving to putaway, stock taking, replenishment, picking and packing and even outbound. Developments in hardware and software now enable them to identify and correctly handle non-standard shapes, with the ability to increase productivity. Robotics and automation can take over the dull repetitive tasks, freeing the workforce to focus on more rewarding, higher-level work. They can also assist in order fulfilment, stocktaking and customer services, and packing for safer fulfilment. There are even a number of robotics solutions operating in 'last mile' delivery to the recipient's door.

Robotics and automation generate data that can be used to gain a real-time overview of performance across the entire process. The benefits are numerous, less waste and increased efficiency in processes, and better quality and safety for the workforce. They are part of new business models that can help companies remain competitive while optimising their processes, space utilisation and overall offer.

With a business case that sees lowered upfront costs as well as an ongoing basis - including new leasing models affording companies greater flexibility - the ROI of automation and robotics has increased significantly, encouraging an exponential growth of adoption. Limited visibility of goods' journey effects every step and stakeholder within the supply chain.

A 2020¹ survey showed that warehouse automation is expected to become an increasingly desirable option to the manual alternative over the next 2-3 years. The warehouse automation market is expected to grow from \$10bn in 2020 to over \$70bn in 2025 (Interact Analysis, 2021).

This broad interest in warehouse automation is very encouraging and the survey findings also indicate that changes in the operating environment - such as labour costs, labour shortages, and increased throughput requirements - are primary influential factors.

They are also the factors that make it feasible for the industry. The current advancements in automation, which have brought about lower costs and scalability improvements, are conveniently supporting the change towards innovative approaches in warehouses and the logistics industry in general.

Much of the hesitancy in the industry stems from a lack of knowledge about the new technology, and a fear of the potential risks it raises in terms of return on investment, costs, impact on workforce and general market competitiveness.

In this white paper, we take a closer look at the arguments and the technology, and explore proven solutions that are available now.

¹ <https://www.dexory.com/articles/66278-a-look-into-the-future-of-warehouse-automation>

2 Introduction: Robotics and automation continued

IMPROVEMENT IN EFFICIENCIES AND THE INTERNET OF THINGS

There is strong evidence that improvements in processes, efficiencies and real-time data can have an immense and immediate impact. The benefits are long-lasting and can ease the pressures to keep the supply chain going. All these factors are increasing the adoption of warehouse robotics and automation.

RETAILING AND ECOMMERCE DYNAMICS

The use of Industrial Internet of Things (IIoT) technologies allows warehouses to become better at managing and performing a multitude of tasks, improving operational efficiency by huge margins. They have real-time data transfer, flexible communication, and Big Data analytics. These, along with the cloud-based solution, enable automated, sophisticated, and agent-based control.

The eCommerce growth has shone the spotlight firmly on key fundamental requisites: speed and accessibility to a broad and wide range of products. eCommerce also creates spikes in systems, reaching crescendo levels at peak seasonal dates for retail that include Black Friday, Valentine's, Easter and Christmas periods, etc.

The industry has moved swiftly to build capacity and find ways to optimise space to service those peaks. In such cases, the benefits for increased automation in picking, packing and sorting are more than obvious.

2 Introduction: Robotics and automation continued

RACE TO TECHNOLOGY

Technology has not stopped innovating and there will be more news along the supply chain that can be further automated in years to come. While the technology may be cheaper in a few years time, first mover advantage brings substantial rewards. There are also innovative business models such as a Service (BaaS) that would allow them to dip their toes in without major investment.

COPING WITH OMNI CHANNELS

Most retailers have reacted to the eCommerce growth by offering consumers the ability to purchase and receive delivery through any channel. This is apart from consumers visiting their bricks and mortar stores and purchasing in person and taking it away with them. This new norm is creating complexities in the supply chain as retailers adapt to provide faster deliveries and build new fulfilment centres to cope with the flows.

ORGANISING THE WORKFORCE

A recent Harvard Business Review study looked at the effects of automation on warehouse workers². There are millions working in warehouses globally. While there has been some prior studies which have explored the impact of automation on these workers, there is still limited understanding of how automated technologies are changing these employees' daily lives. Concerns range from fear of job loss to inadequate training resources, which would reduce their ability to succeed in this new digital and high-tech environment. Then, there is also the fear of unreliable technology where if it breaks down, workers would not be able to fix it and get their work done effectively.

² <https://hbr.org/2022/02/research-how-do-warehouse-workers-feel-about-automation>

3 The technology continued

UNRAVELLING ROBOTICS AND AUTOMATION

Research by Forrester has found that automation - including robotics, artificial intelligence (AI) and Machine Learning (ML) - is already a defining industry trend that will continue to expand in the next two decades¹. It is also one of the most popular choices for improving operational efficiency with tactical automation.

EASING THE PRESSURE

At first glance it would appear that the only way for companies to ease the pressure will be to introduce big changes to the way they operate along the supply chains.

At the same time, automation in logistics and warehousing present immediate solutions and immense opportunities for early adopters. Companies can differentiate their propositions through improved services, efficiencies throughout the workflow, space optimisation and high-speed fulfilment.

From the automation of inventory into, within, and out of the warehouse and then onwards to customers with minimal human assistance, to the labour-intensive tasks that involve repetitive physical work, manual data entry and analysis.

Companies can also improve operations by minimising human errors with real-time data.

¹ <https://www.urwteach.ai/2m-european-jobs-will-be-lost-to-automation-by-2040>

4 Applying automation: Robotics benefits and applications continued

SAVING COSTS

Automation and robotics solutions reduce costs, time and inaccuracies. Apart from the space optimisation, companies can also see that once tasks that are manual, paper-based and labour intensive are automated - such as measuring pallets for dimensional accuracy - they free the workforce to focus on more complex value-adding tasks. There is also a higher level of enhanced accuracy and transparency, both of which deliver increased revenues that would otherwise not be realised.

A cargo warehouse today loses hundreds of thousands of pounds from assets with under-reported dimensions. Robots and automation can solve many problems:

- Lead to better inventory control, where goods with underreported volumes can now be easily identified.
- Track and detect goods across the warehouse, providing full, remote visibility in real time.
- Cut down on errors in logistics such as early detection of non-compliant goods.
- Ensure that relevant stock is always available to pickers.

Same with damaged goods for insurance claims, robotics and automation allow for the recovery of revenues that would otherwise be lost or identified too late in the process.

The pandemic, resultant shortages and restrictions have brought home the immense value and benefits of real-time data, automation and robotics to manage processes, as well as track and identify gaps and areas of concern within the supply chain.

Their application has also highlighted the fact that robots can carry on operating even in a pandemic, freeing the workforce to focus on the value-added work and management of the processes.

At Dexory, we see this as a crucial time for the warehouse and logistics sectors to keep pace and invest in automation and robotics to remain part of the supply chain reimagined that will make them smarter and more resilient.

By controlling the movement of goods in any warehouse space using autonomous data collection and digital twins, companies can maximise the space utilisation and reduce the need for extra space creation.

5 DexoryView - Dexory's solution: How it all works continued

OUR SOLUTIONS AS PART OF THE REDESIGN

Dexory is a full stack solution provider with a cutting edge data collection system to boost warehouse productivity. Our solution is unique, fast and easy to implement and scale.

We use cutting-edge engineering, state-of-the-art robotics and AI products to make robots more useful, accessible, and intuitive for humans to work alongside in warehouses.

With no complex infrastructure changes required, our fully-autonomous solutions are cost-effective under a full-service subscription offer (BaaS) and unlike any alternative solutions, are easy to install and scale.

HOW IT ALL WORKS

A seamless solution, fully integrated into the warehouse processes to cause no disruption. Automating inventory management.

- Robots navigate autonomously, avoiding obstacles and scans warehouse locations
- Perception system identifies assets/gaps and places them on 3D maps
- Data is integrated into WMS to close data loop
- Easy to implement and scale

A fully autonomous robot can detect its environment, make decisions based on what it perceives and/or has been programmed to recognise, and then act without human intervention.

5 DexoryView - Dexory's solution: How it all works continued

CONTROLLING INVENTORY

69% of companies are looking to improve their inventory control, as a more specific action to lower costs (Logistics Management, 2021). We know that asset retrieval inside warehouses - whether lost or misplaced - is an area of concern. Our aim is for loss prevention and productivity boost.

With our robots, there are significant cost-savings to be made as they navigate warehouse floors to capture real-time location for assets. Right from the beginning, there is immediate gain in terms of revenue recovery from lost, misplaced or non-compliant assets.

The bespoke design robotic platform and stack system integrates seamlessly into warehouse operations. The data flows continuously from the robot, which can quickly measure, track and find goods without any infrastructure changes. No human effort is required to get this continuous stream of data.

Automating inventory processes immediately leads to increased productivity and efficiency. There are several examples where the adoption of automation has eased the pressure on resourcing and efficiency.

It is also easy to see how once tasks that are manual, paper-based and labour intensive are automated - such as measuring pallets for dimensional accuracy - it frees the workforce to focus on more complex value-adding tasks.

SCALABILITY

DexoryView is part of a solution that can easily be customised and scaled up to meet the warehouse's specific requirements.

Designed as a cloud-based platform, DexoryView provides central administrative control of 1000+ devices to ensure seamless scaling of operations and access to data for all relevant teams.

Our platform provides a distributed system consisting of communication agents running on our fleet of autonomous robots. Using secure, encrypted and real-time communication channels on our platforms, the robots seamlessly exchange information and tasks. The high-performance platform allows the robot fleet to make decisions faster than other systems available on the market. Real-time information from each robot is available instantly on every other robot in the fleet, allowing each robot to build a full picture of what is happening across an entire warehouse.

Contacts:

Chief Commercial Officer, Dexory
Diana Singh
diana@dexory.co.uk
Director of Marketing, Dexory
Jackie Bibby
jackie@dexory.co.uk

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DEXORY

Westbourne Studios, Room WE1267,
242 Acklam Road, Portobello,
London, W10 5JL, UK
www.dexory.com

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