Fulfilling the future

09 June 2023

The exponential boom of e-commerce has placed increased pressure on warehouses to meet customer delivery expectation. Businesses are working to futureproof operations against the challenges facing the sector so that parcels can be delivered quickly and efficiently. But how can the present and future requirements of fulfilment centres be met effectively to ensure that productivity and profitability are maximised? The answer lies in flexible, easy to integrate and scalable automation systems.

Hans Jongebloed, Senior Postal and Parcel Expert at Prime Vision, a global leader in computer vision integration and robotics for logistics and e-commerce, explores modern trends affecting warehousing and how operators can unlock the doors to the fulfilment centre of the future.

The pressures of an e-commerce revolution

Expected to surpass $8.1 trillion globally by 2026*(1)* and achieving an annual revenue of over $120 billion in the UK in 2021*(2)*, e-commerce is quickly supplanting traditional retail, creating a 24/7 economy where consumer orders must be fulfilled as quickly as possible and without error. This boom has meant existing warehouse infrastructures and personnel are often struggling to achieve ever greater fulfilment targets. This is challenging enough in isolation, but other conditions play a factor.

First, reshoring of supply chains is bringing fulfilment centres closer to home. Businesses are looking to insulate operations from disruption, moving facilities nearer to customers to shorten delivery times. However, space on the planet is finite,

which often restricts the size of available warehousing or what can be built locally. Companies must be flexible to fit in the space that is available, which often means maximising the existing footprint.

Considering human and environmental factors

The approach to labour must also adapt. Existing warehouse personnel manually transporting goods over every day to meet ever-rising fulfilment targets is unsustainable physically and incompatible with next day delivery. Compounding this, the e-commerce boom has been so sudden that there are simply not enough workers available to support demand. Therefore, existing staff need assistance to improve work circumstances, forgoing manual labour in favour of more efficient tasks suited to their skillset.

Sustainability requirements exert an influence too. Efforts to minimise the environmental footprint of an organisation and building multiple large warehouses are often mutually exclusive – so smaller, more space efficient sites are needed. Achieving this means higher racking and more optimised inventories. A compact, local operation can also consume less energy and reduces emissions from delivery vehicles.

Fulfilment through automation

Against these extenuating factors, automation offers a proven way to futureproof warehouse operations. Applicable to every aspect of a fulfilment centre, it facilitates the operational efficiencies required to achieve higher delivery targets, all while optimising local sites and reducing the burden on personnel.

Application of automation begins when factory goods arrive at the warehouse. Semi-automated systems can unload stock onto conveyors, which is then scanned, sorted and transferred to storage. At this point, an automatic storage and retrieval system can track and pick items for an order in the correct sequence. Personnel then take items and pack them into a box provided by a robot. Once packaged, a robot can close and seal the box and apply a barcode, transferring it to the delivery point or even a vehicle.

Technologies such as artificial intelligence (AI) supplement this framework. Using AI-driven analytical software platforms, for example, can help to identify correlations across order data. This intelligence can be used to highlight times when order volumes for certain products are particularly high (pumpkins in October) or locations that typically sell a large quantity of a specific item (ski jackets near the mountains). Consequently, staff or an automatic ordering system can ensure stock replenishment when needed, reducing the likelihood of shortages. When paired with cameras, AI-enabled systems can also double-check storage racking and cross reference it with the stock list, spotting empty spaces and helping to top up inventory if required.

Overcoming today's warehouse challenges

The beauty of this automated warehouse system is its division of labour. Robots take on the strenuous manual work while also offering repeatability and speed. Conversely, personnel can focus on the system oversight and value-adding tasks that they are best-suited for. With this delegation comes greater efficiency. Automation optimises processes, allowing higher fulfilment targets to be achieved, overcoming potential labour shortages. Critically, it also ensures that these levels of service can be attained while reducing the burden on employees, protecting personal wellbeing.

A more efficient warehouse can translate into a smaller warehouse. Automatic storage and retrieval systems allow racking to be taller, improving on-site storage capacity. More stock can be held in less space, enabling smaller facilities to be more flexible and punch above their weight.

Businesses can adapt operations to fit within different sized facilities, safe in the knowledge they have the required efficiency and growth potential to meet future demand. In an economy where reshoring and localisation is gaining momentum, these goals can be achieved without negatively impacting service levels.

But where to begin?

Prime Vision typically encounters warehouse operators looking to improve specific processes. Deploying scalable solutions that can grow with the needs of a business is essential and an automatic storage and retrieval system is a good starting point. This greatly improves fulfilment efficiency, saves space, reduces the burden on personnel and can automate up to 80% of operations. Prime Vision's solutions can then fit seamlessly within this pre-existing framework.

For the next step, autonomous mobile robots (AMRs) should be considered. Conveyor systems are another option to transport parcels around the warehouse, but they are costly, static and can only be optimised once – so they can't grow with a business. Contrary to conveyors, robots can be programmed to travel new routes over and over again according to current needs, and the number of them can be scaled up and down at will too. Prime Vision's robotic systems offer a 35 kg carrying capacity and can detect packages from 100 g. At 1 metre high and featuring an 80 cm x 60 cm loading surface, they have the capacity, scalability and flexibility to meet multiple parcel demands.

Computer vision technology means that addresses, barcodes and other product information can be quickly scanned and utilised by warehouse systems. Prime Vision offers solutions that can even read damaged labels and confirm stock quantities, which allows inventory to be fully optimised and traced.

Data such as that gathered by vision systems can then be harnessed by Prime Vision's analytics products. Consequently, order trends can be identified and stocking levels can be automatically adjusted to suit the requirements of certain time periods or warehouse locations.

Delivering the future with automation

Following the e-commerce revolution, customer expectations of same or next day delivery has become the norm with 22% abandoning their carts when shipping is too slow*(3)*. This is an irreversible trend and one that fulfilment must adapt to. Adding to this commercial pressure is the safeguarding of labour and creating highly efficient, compact operations.

Simply put, it will be impossible to attain the fulfilment targets needed to sustain this customer expectation without an agile and scalable automation setup. This will help alleviate the pressure that companies are facing by enabling them to optimise their operations, improve productivity and make the e-commerce service level manageable.

Readily available solutions mean that the fulfilment centre of the future can be created today. By partnering with an expert such as Prime Vision, with its proven robot, vision and analytic solutions that integrate with systems from other vendors – warehouses can achieve new efficiencies, futureproofing them in an e-commerce driven economy.

Sources:

(1) 38 eCommerce Statistics of 2023 – Forbes Advisor

(2) Assessment of Current Buyer Behaviour in Market – International Trade Administration

(3) Statista - Main reasons why consumers abandon their orders during the checkout process in the United States in 2022

Image captions:

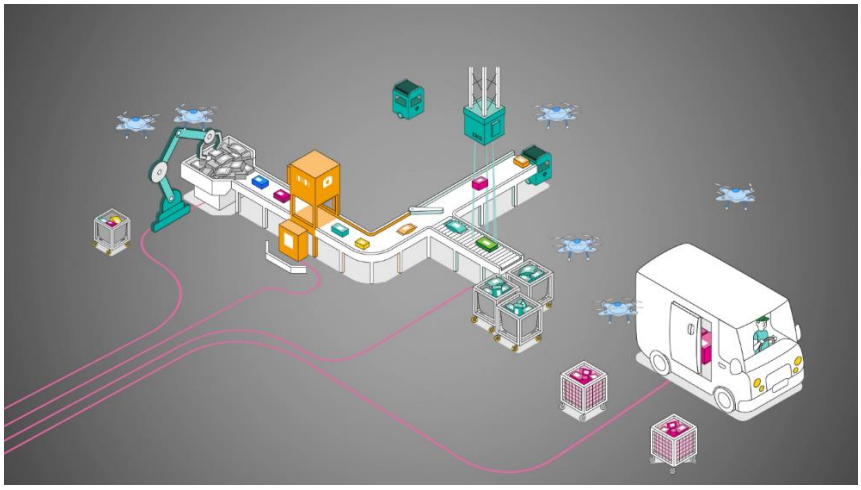

Image 1: Image 1: A fully automated warehouse

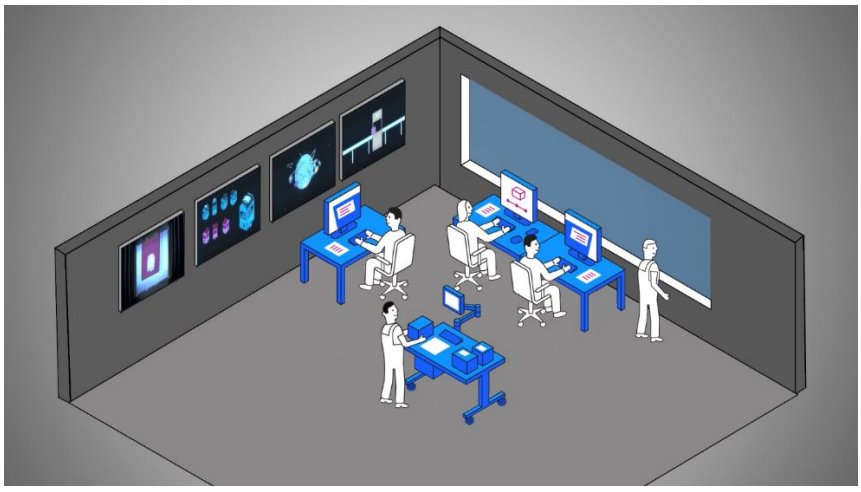

Image 2: AI-driven analytical software platforms can help to identify correlations across order data

Image 3: Robots can be programmed to travel new routes over and over again, and the number of them can be scaled up and down

Image 4: Prime Vision's robotic systems can carry parcels from 100 g to 35 kg

About Prime Vision

Prime Vision is a global leader in computer vision integration and robotics for logistics and e-commerce. As an award-winning company, Prime Vision designs and integrates solutions using the latest recognition, identification, and robotics techniques to optimize the automation of sorting processes.

Headquartered in Delft, The Netherlands, more than 170 experts provide comprehensive market and domain knowledge to digital companies around the world.

For more information, visit https://primevision.com/

Editorial Contact:
DMA Europa: Aija Senberga
Tel: +44 (0)1905 917477
Web: news.dmaeuropa.com
Email: press-team@dmaeuropa.com
Address: Progress House, Midland Road, Worcester, Worcestershire, WR5 1AQ, United Kingdom

Reader Contact:
Prime Vision: Ellen Brender à Brandis
Web: https://primevision.com/
Tel.: +31 15 219 2090
Email: info@primevision.com
Address: Olof Palmestraat 10, P.O. Box 6034, 2600 JA Delft, KVK 08068458