Automation Strategies for Distribution Success

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Introduction

Distribution is a dynamic challenge.

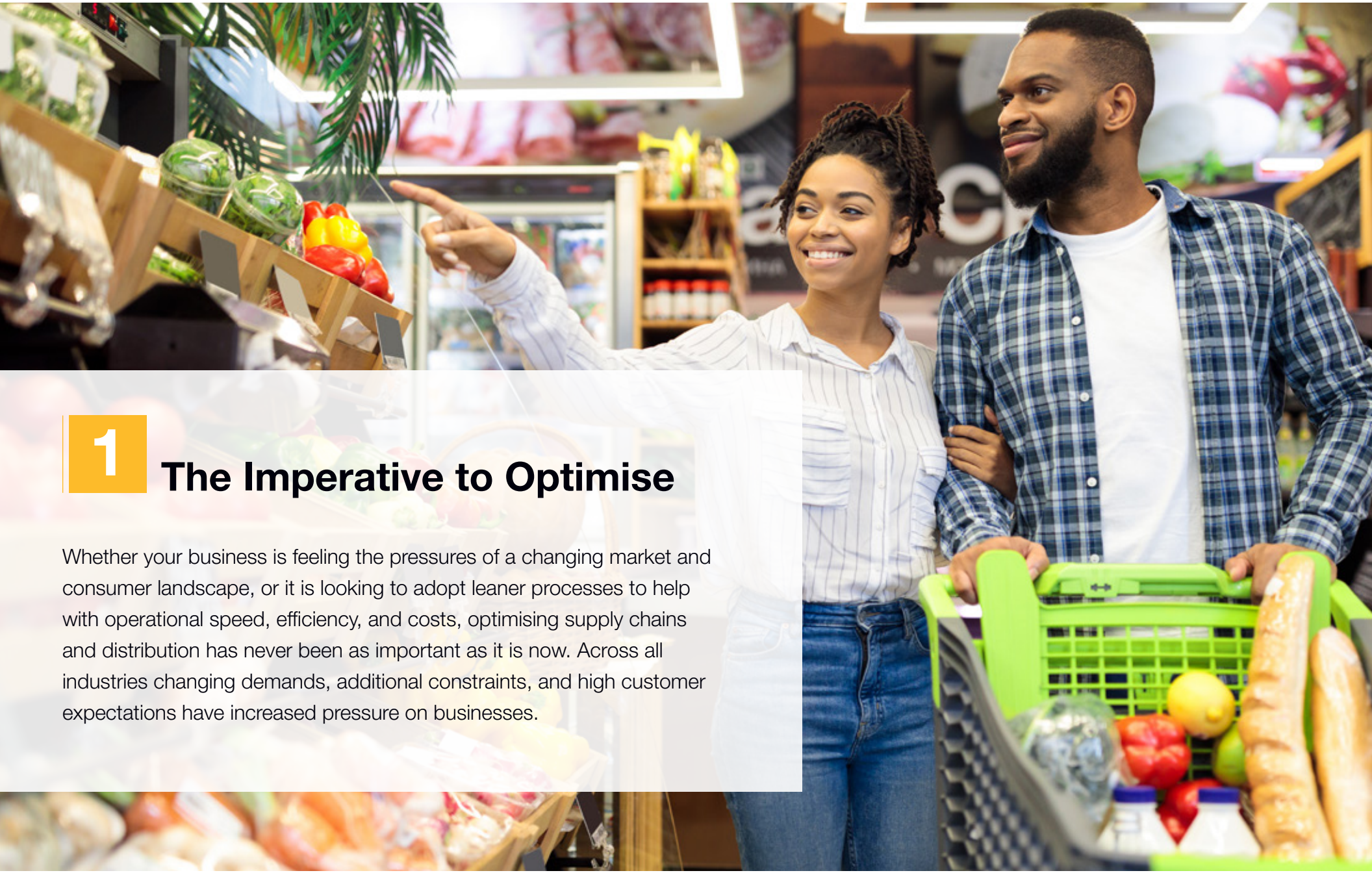
Today's businesses are under pressure from consumer and market demand for competitive pricing, shorter lead times, products delivered anywhere, in full, on time, and – in the case of retail consumers, more frequently – all in a store friendly format.

For online orders, customers want up-to-date information on stock availability, and access to the real-time status of their orders. On top of it all, businesses continue to contend with increasing labour costs (let alone finding and keeping workers), increasing land costs and pressures from increased regulation and safety requirements. The booming growth of e-commerce, the pandemic, and other recent developments have only amplified these challenges.

Increasingly companies are realising the imperative to automate to address these challenges.

In the past, it has been perceived that automation is a journey, with companies initially investing in low-level “islands” of automation addressing a single application – be it storage, order picking, or transport. As they grew and became more experienced with automation, they looked to invest in more integrated, more fully automated systems. However, advances in automation in recent years have completely turned this paradigm around.

Finding success with the right level of technology and automation for your business no longer depends on past experience, but it will depend on several other factors. In this interactive document, we explore the four biggest imperatives to optimise, the key areas of optimisation, and the technologies and innovations delivering optimised supply chain and logistics operations.



1 The Imperative to Optimise

Whether your business is feeling the pressures of a changing market and consumer landscape, or it is looking to adopt leaner processes to help with operational speed, efficiency, and costs, optimising supply chains and distribution has never been as important as it is now. Across all industries changing demands, additional constraints, and high customer expectations have increased pressure on businesses.

Consumer Demands

Today, more than ever, consumers have all the power. If you don't have what they want in the right size, the right colour, at the right price, and in the right place, that sale will almost certainly be lost. It's so easy for consumers to find what they want – your competitors are just a web search away.

While much of the world, including many parts of APAC, were initially slow to embrace online shopping, the pandemic gave consumers a mighty push in that direction. E-commerce spending grew significantly in the eight weeks after the pandemic was declared, with some major retailers announcing up to 80% growth in online orders in that period.

The trend is still going strong. In 2021, global sales made from online purchases reached 21%, which represented a 17.9% increase in e-commerce market share over two years[1]. And that growth is expected to continue, potentially reaching 24.5% by 2025, which translates to a 6.7 percentage point increase in just five years.

So, what can you do to prepare and beat your competition? **Meet and exceed consumer expectations**. Ensure product availability, minimise costs, provide the fastest delivery, eliminate errors and product damage, and offer seamless returns.

[1]Shopify, Stats and Trends to Watch in 2022, Feb 2022

Labour Costs and Availability

Finding and retaining labour in a distribution centre is becoming an increasing challenge for many industries, especially in much of Asia Pacific, as the cost of labour is constantly on the rise. Needing higher productivity from people, complying with regulations, and keeping staff safe, are real challenges. Good occupational health and safety is always crucial, but to keep up with demand many employers are asking their workforce to work faster. Clearly, this isn't the right strategy to get ahead of supply chain challenges. Instead of working harder, **logistics operations need to work smarter**.

Rising Cost of Space

With increasing urbanisation, land is becoming scarce and very expensive, particularly land close to consumers. In Australia for example, rent for warehouse space has increased by at least 25% in the last three years, and available commercial land in a city such as Sydney has reduced by 35% in the last five years. While in Asia, following a drop in 2019, industrial land prices have once again started increasing in cities such as Singapore and Shanghai.

Dealing with Volatility

Recent years have shown how significant changes to supply chain can be and that any change can have dramatic consequences.

The pandemic created volatility in several ways:

- Sudden increases in demand of certain items due to panic buying
- Sudden and sustained increase in online sale
- Sudden and unexpected drop in store sales

With both demand and supply disruptions becoming more frequent, companies need the right adaptive strategies to stay ahead, focusing on **maximising resilience to disruptions and building agility to prepare for volatility**.

2 Optimisation is Key

Optimisation falls into three broad categories: Processes, Human, and Inventory.

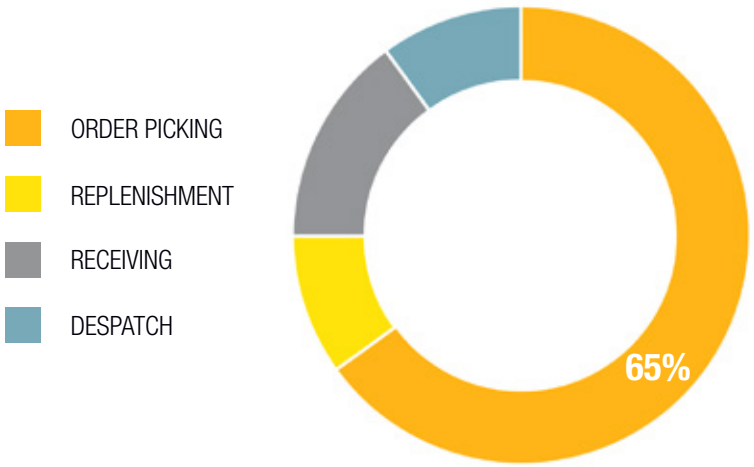
Processes

Processes provide the structure for supply chains to function. There is a need for companies to continuously review and optimise processes as a way of increasing productivity, removing non-value adding activities, reducing errors, and increasing the speed of operations. This includes:

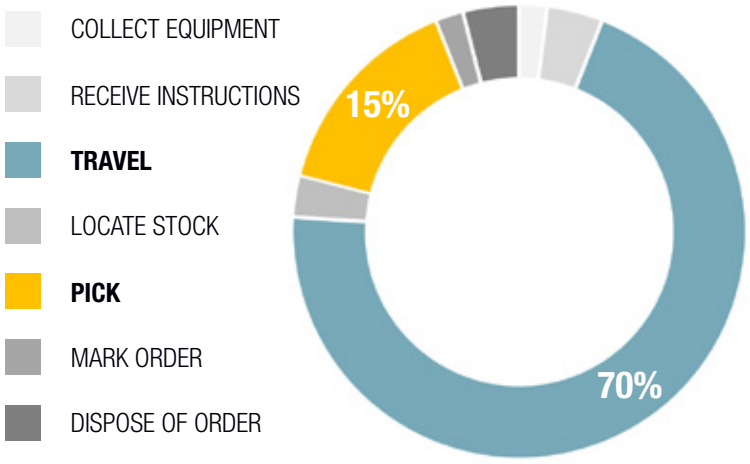
- Streamline processes to eliminate touches (the number of times workers need to handle a product)
- Reduce operator travel (a major non-value-adding task in manual picking operations)
- Combine processes (such as batch picking products for multiple orders or doing stock take checks while picking)
- Introduce checks and balances

When processes are optimised, new technologies and software can take productivity to the next level.

TYPICAL STAFFING BREAKDOWN IN A MANUAL OPERATION



THE ORDER PICKING TASK IN A MANUAL OPERATION



Human

While streamlining processes does improve the human factor – particularly by reducing non-value adding activities like travel – operations should also look to optimise worker activities to better use their time and increase their speed and accuracy. Opportunities of optimisation become available when you know how, when, and how often task are performed. From here you can streamline operations, reduce repetition, limit number of touches, improve operator ergonomics, reduce training time for new users, and improve the overall worker environment.

Optimising tasks for workers often include providing instructions in real time via a mobile computer or by audio headsets, which has the added benefit of increased speed, having workers confirm actions in real time to improve accuracy, operational visibility, and labour management, and optimising ergonomics for improved safety and speed.

Inventory

The storage of inventory is constantly changing, and efficiencies of space and movement need to be continuously reviewed. Storage has moved on from a simple static operation to dynamic storage which provides further optimisation benefits.

Storage does not just occur in warehouses but also in retail stores. Manual and Automated Storage Retrieval Systems (AS/RSs) aren't the only material handling technologies that store inventory, and Automated Guided Vehicles (AGVs) and mobile robotic and shuttle systems have become dynamic storage solutions. Retail stores have become dynamic warehouses in the e-commerce world and trucks have become warehouses on the road. Real-time operation-wide data provides further potential for optimising inventory.

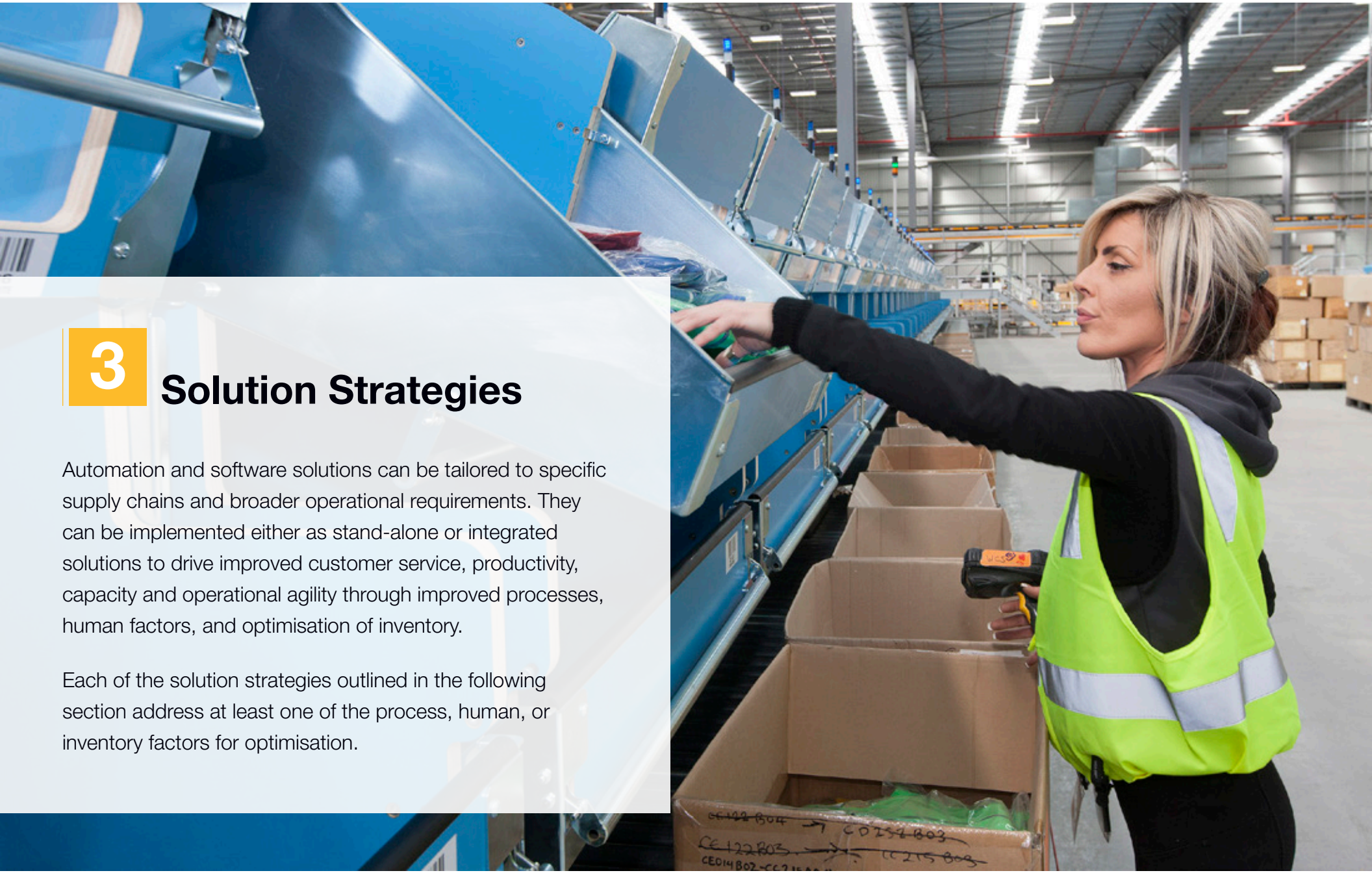
Optimising inventory and its management can:

- Maximise storage capacity (e.g. by increasing storage density and more effectively using headroom)
- Optimise stock accessibility and the speed with which product is transported between applications
- Centralise inventory to get efficiencies in scale and reduce the required level of safety stock
- Locate inventory close to consumers to improve delivery speeds.

Optimisation with Information

Optimisation occurs when we analyse information relating to process, human factors, and inventory. Analysis and analytic tools provide a continuous improvement environment to reduce waste such as non-value adding tasks, unnecessary space, and costly mistakes.

Industry 4.0 capabilities provide a seamless interface between humans, products, automation, robotics, big data and operational visibility, maximising performance and responsiveness to operational and customer demands. Robust and real-time integration between software platforms across the supply chain and within the operation – ERP, Warehouse Management, Execution and Control Systems is key.



3 Solution Strategies

Automation and software solutions can be tailored to specific supply chains and broader operational requirements. They can be implemented either as stand-alone or integrated solutions to drive improved customer service, productivity, capacity and operational agility through improved processes, human factors, and optimisation of inventory.

Each of the solution strategies outlined in the following section address at least one of the process, human, or inventory factors for optimisation.

Software

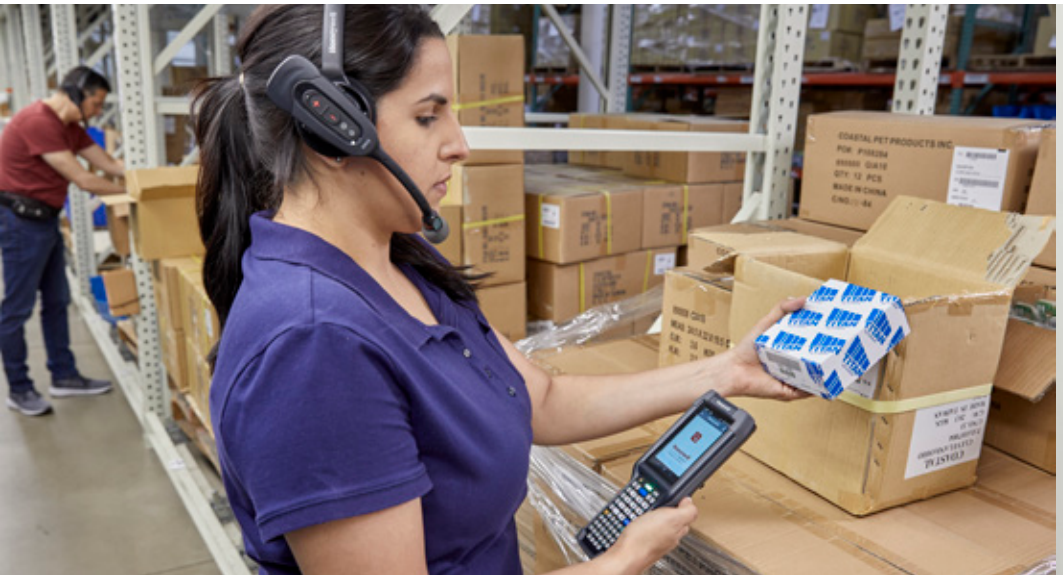
PROCESS HUMAN INVENTORY

All businesses use some level of software for inventory management, order management, material flow, machine control and operational visibility. Warehouse software systems provide a single interface for all applications within a facility with a host system, typically an ERP (enterprise resource planning) system.

Supply chain software can elevate and optimise these features with Industry 4.0, Internet of Things (IoT) and Artificial Intelligence (AI) capabilities, to support a seamless interface between operators and data. This ensures optimal flow of goods and data and provides key analytical insights.

User-friendly interfaces with customised graphical analysis, dashboards and reports, deliver complete system management capabilities and data-driven intelligence for decision support. This provides businesses with the agility needed to maximise system performance for better responsiveness in meeting consumer demands.

DISCOVER DEMATIC SOFTWARE ▷



RF & Voice

PROCESS HUMAN INVENTORY

Many manual operations have be improved by adding a smart overlay of data-enabling devices that bring instructions from the software to the shop floor in real time, boosting accuracy and inventory management. Wireless Radio Frequency (RF) Terminals and Mobile Data Terminals create a paperless environment to transfer information across the supply chain. These devices can enhance efficiency, increase accuracy, and provide greater supply chain visibility and traceability.

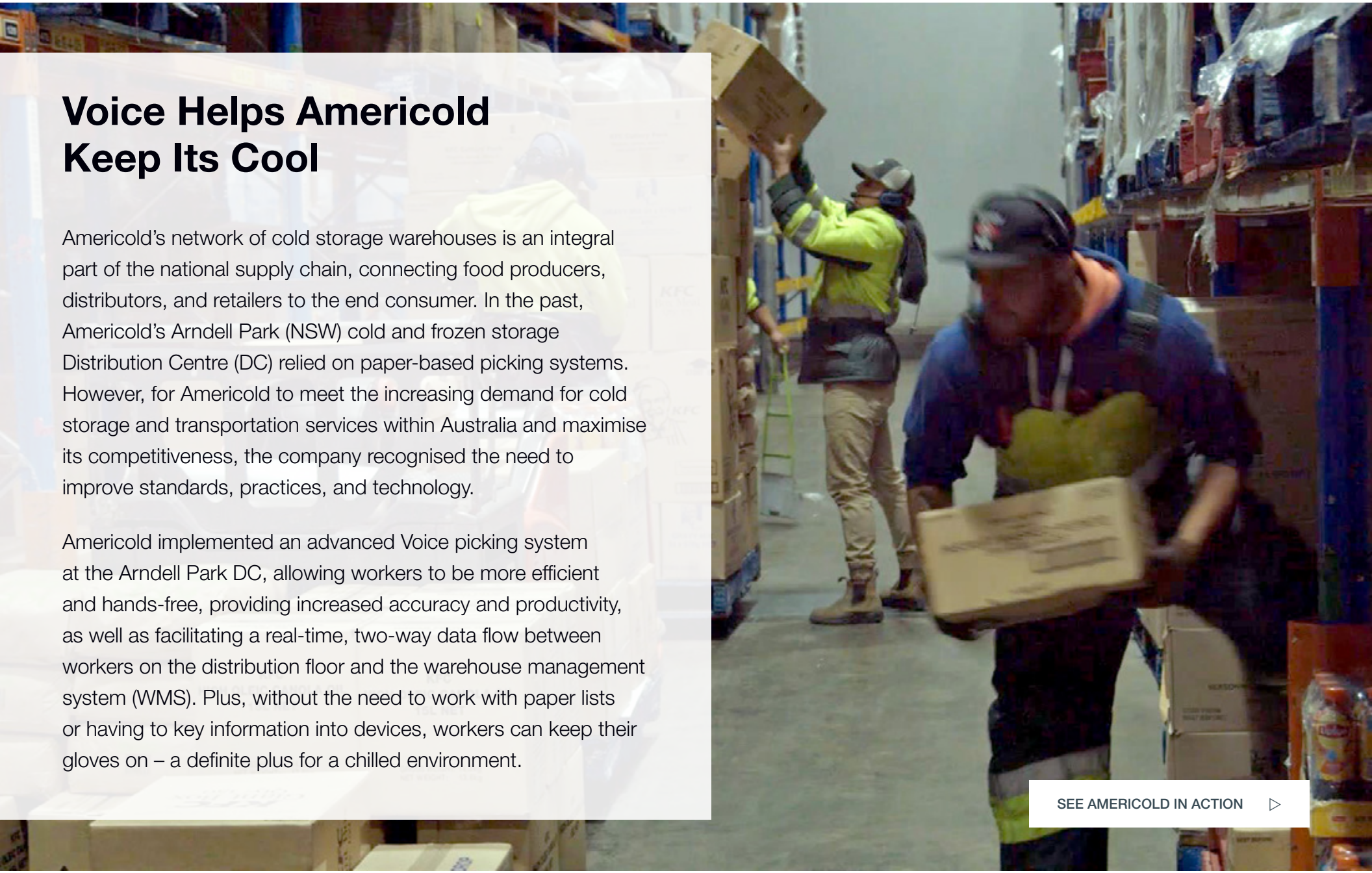
Voice Technology can provide further productivity gains, particularly for order picking, where workers are directed and confirm tasks using voice commands via a headset. Eliminating the need to interact with a screen and keypad frees hands and can increase productivity 20-30% as well as improve workers' situational awareness for increased safety. Voice technology can be enabled on existing Android devices, making use of a single device for both Voice and RF tasks.

DISCOVER RF AND VOICE SOLUTIONS ▷

Voice Helps Americold Keep Its Cool

Americold's network of cold storage warehouses is an integral part of the national supply chain, connecting food producers, distributors, and retailers to the end consumer. In the past, Americold's Arndell Park (NSW) cold and frozen storage Distribution Centre (DC) relied on paper-based picking systems. However, for Americold to meet the increasing demand for cold storage and transportation services within Australia and maximise its competitiveness, the company recognised the need to improve standards, practices, and technology.

Americold implemented an advanced Voice picking system at the Arndell Park DC, allowing workers to be more efficient and hands-free, providing increased accuracy and productivity, as well as facilitating a real-time, two-way data flow between workers on the distribution floor and the warehouse management system (WMS). Plus, without the need to work with paper lists or having to key information into devices, workers can keep their gloves on – a definite plus for a chilled environment.



SEE AMERICOLD IN ACTION ▷

Put Walls

PROCESS HUMAN INVENTORY

An efficient way to process orders that require individual items to be picked, packed and shipped is to batch them together and handle multiple orders for the same item simultaneously. Workers pick the total number of items required for the batch in one pass, and then sort the individual items to their relevant orders.

Put Walls functioning as order consolidation and packing hubs provide high productivity, order accuracy, and speed and efficiency in split case picking applications. First, items required for a batch of orders are picked and delivered to the Put Wall, a double-sided wall of shelving with individual compartments for each customer order.

The front of the Put Wall is for “putting” items to orders, while the rear is set-up for packing. Put Wall throughput rates can range from 200 to 500 items per worker per hour, depending on the application, with the packing side typically processing 100 to 250 items per worker per hour.

DISCOVER DEMATIC PUT WALL SOLUTIONS ▷

Conveyor Systems

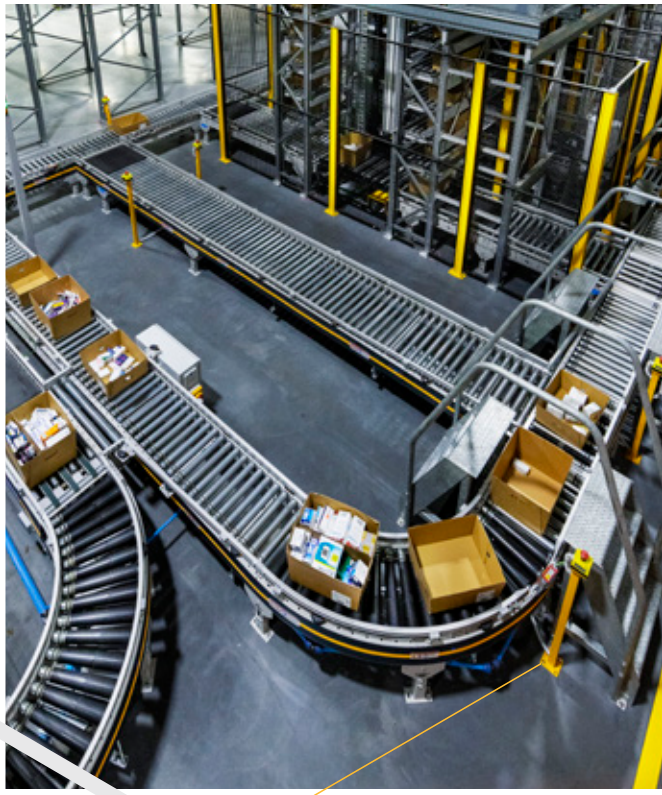
PROCESS HUMAN INVENTORY

One of the biggest time wasters in order fulfilment is travel, with workers often travelling large distances from location to location to find and retrieve stock. For many operations, smart conveyor systems are a simple way to address the travel issue and dramatically enhance productivity and efficiency by letting the orders travel to workers instead of the other way around.

With smart material flow controls and zone routing, orders do the traveling from zone to zone, and workers stay within their picking zone. Zone routing solutions using carton convyoers are ideal for split case orders to improve in picking processes and make labour applications more effective.

This concept can be applied to entire ranges using different levels of automation to optimise picking efficiency across the product movement curve. For example, combinations of carton live storage zones and conventional binning zones can be arranged with various combinations of pick-to-light and voice-directed picking to enhance productivity and accuracy for fast movers and slow movers alike. Intelligent software takes orders only to the zones where they are needed, eliminating bottlenecks in material flow.

Pallet and carton conveyor systems can also automatically connect various stages of an order fulfilment process from inbound, to storage, to picking, to packing, and finally to sortation and despatch. The result is a more streamlined flow of product throughout the facility and a more efficient use of labour.



DISCOVER CONVEYOR SOLUTIONS ▷

Automated Guided Vehicles

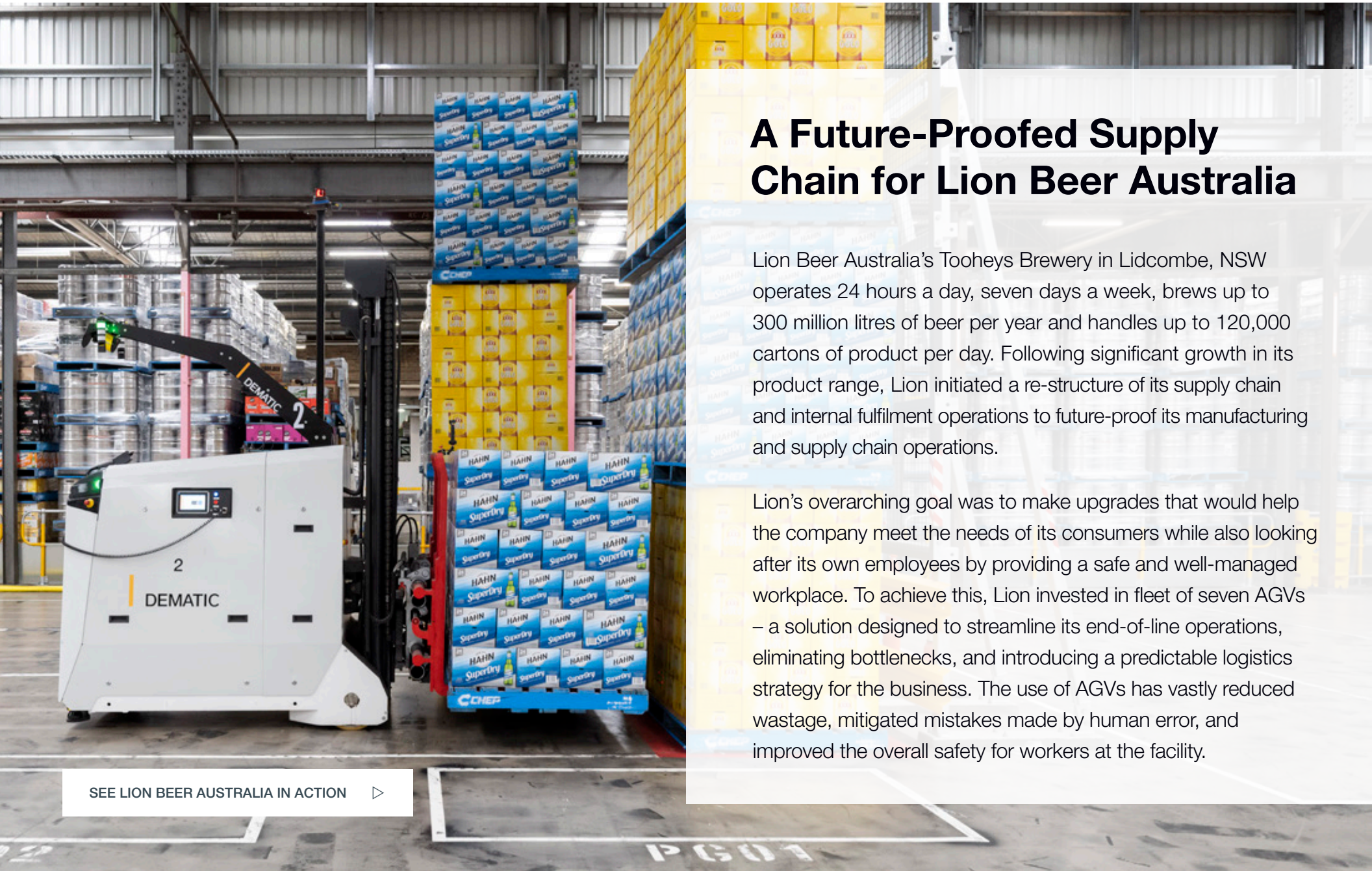
PROCESS ● HUMAN ●●● INVENTORY ●●

Automated Guided Vehicles (AGVs) are used in a variety of industries to transport and store materials. Equally at home in factories, warehouses, and distribution centres, AGVs are a safe and secure way to increase process efficiency and improve business profitability – all without human intervention.

AGVs can automatically lift, rotate, and shift goods, fetch, and carry loads to and from racking, store and retrieve in block-stack or deep-stack lanes at heights above 10 metres, transport loads over long distances, and transfer loads to and from a wide range of conveyors and workstations.

As opposed to other automated transport technologies such as conveyors, AGV system layouts can be easily adjusted, allowing for better use of the available space. In addition, entire AGV systems can be extended or even relocated.

DISCOVER DEMATIC AGV SYSTEMS ▷



A Future-Proofed Supply Chain for Lion Beer Australia

Lion Beer Australia's Tooheys Brewery in Lidcombe, NSW operates 24 hours a day, seven days a week, brews up to 300 million litres of beer per year and handles up to 120,000 cartons of product per day. Following significant growth in its product range, Lion initiated a re-structure of its supply chain and internal fulfilment operations to future-proof its manufacturing and supply chain operations.

Lion's overarching goal was to make upgrades that would help the company meet the needs of its consumers while also looking after its own employees by providing a safe and well-managed workplace. To achieve this, Lion invested in fleet of seven AGVs – a solution designed to streamline its end-of-line operations, eliminating bottlenecks, and introducing a predictable logistics strategy for the business. The use of AGVs has vastly reduced wastage, mitigated mistakes made by human error, and improved the overall safety for workers at the facility.

SEE LION BEER AUSTRALIA IN ACTION ▷

Automatic Storage and Retrieval Systems

PROCESS ● HUMAN ●●● INVENTORY ●●

Whether it's for heavy unit loads like pallets or smaller loads like totes and cases, storage is a fundamental requirement of every distribution centre. Yet storage is a paradox. On one hand it adds value by providing a critical buffer between your processes and your customer. On the other it adds costs for real estate, facilities, and inventory.

With heights up to 45 metres, Automated Storage and Retrieval Systems (AS/RS) are designed to maximise storage capacity and density in a reduced footprint. They secure inventory, reduce damage, and increase productivity and accuracy.

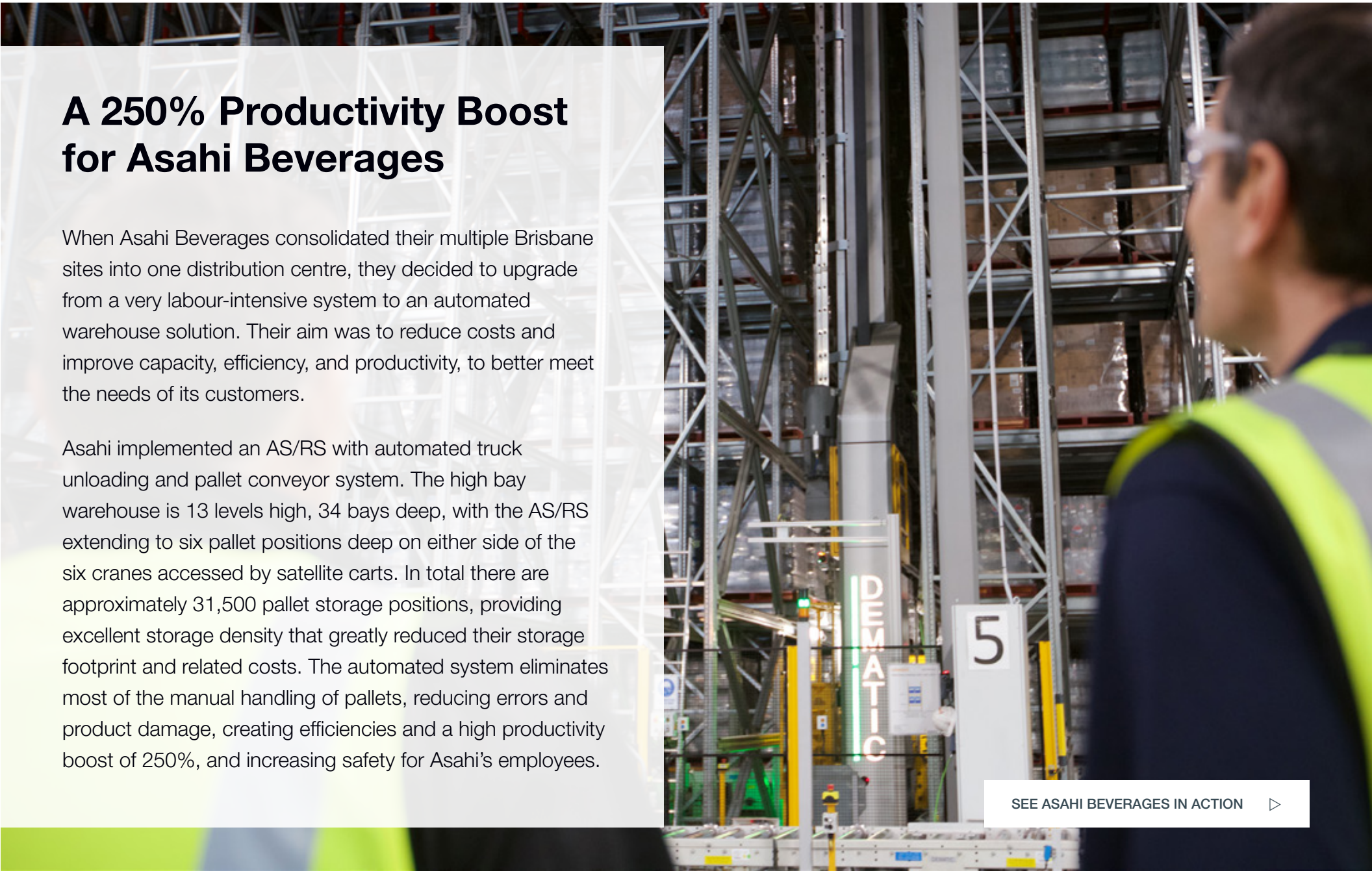
Automatically receiving, storing and retrieving inventory means fast, efficient, cost effective and very reliable material handling. With limited labour requirements, AS/RS also provide significant productivity and operational health and safety benefits.

DISCOVER DEMATIC AS/RS SOLUTIONS ▷

A 250% Productivity Boost for Asahi Beverages

When Asahi Beverages consolidated their multiple Brisbane sites into one distribution centre, they decided to upgrade from a very labour-intensive system to an automated warehouse solution. Their aim was to reduce costs and improve capacity, efficiency, and productivity, to better meet the needs of its customers.

Asahi implemented an AS/RS with automated truck unloading and pallet conveyor system. The high bay warehouse is 13 levels high, 34 bays deep, with the AS/RS extending to six pallet positions deep on either side of the six cranes accessed by satellite carts. In total there are approximately 31,500 pallet storage positions, providing excellent storage density that greatly reduced their storage footprint and related costs. The automated system eliminates most of the manual handling of pallets, reducing errors and product damage, creating efficiencies and a high productivity boost of 250%, and increasing safety for Asahi's employees.



SEE ASAHI BEVERAGES IN ACTION ▷

Multishuttle Systems

PROCESS ●●● HUMAN ●●● INVENTORY ●●●

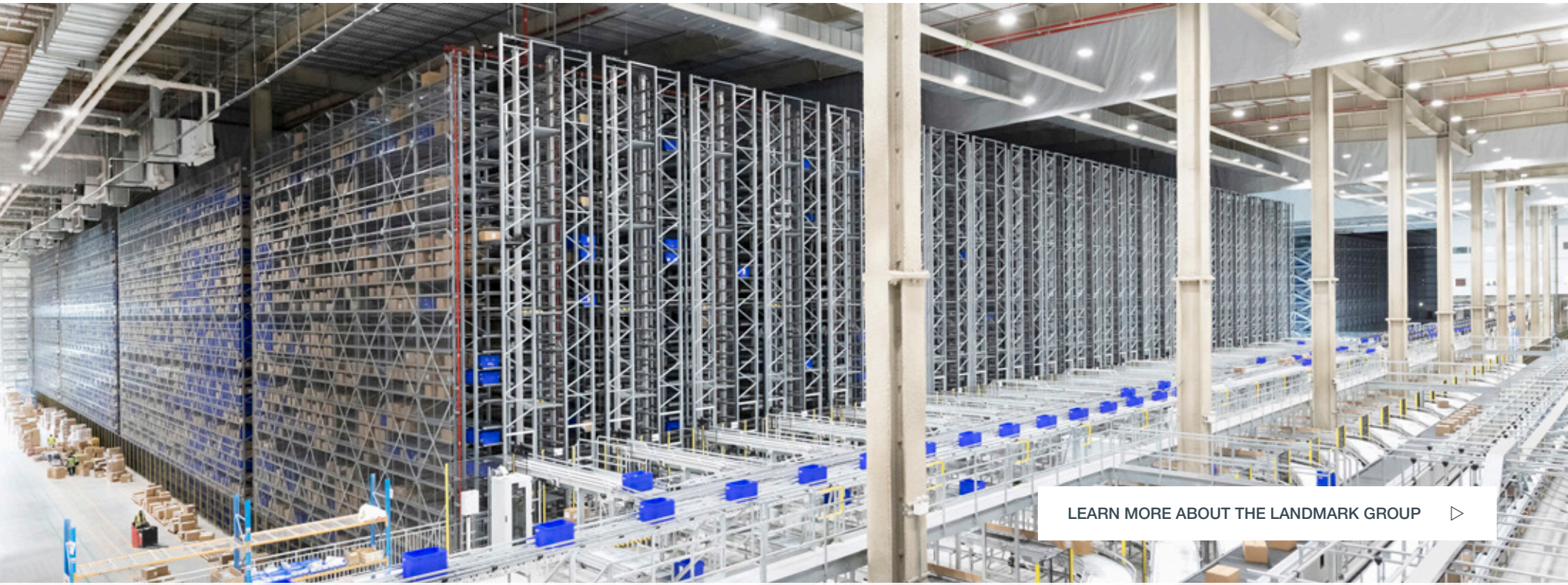
Multishuttle systems are high-rate AS/RS systems for storing totes, cartons, or trays that provide precise sequencing, in smaller space, with greater operational flexibility.

With a Multishuttle operating on each level of storage, retrieval of product can happen very rapidly, and in a specific order, making Multishuttle systems powerful engines for fulfilment operations.

Ideal for supplying product to Goods-to-Person (GTP) picking stations, mixed case pallet building systems, automated replenishment, or as order buffers, Multishuttles can also serve as a pick face replenishment solution. In addition, these systems can be applied as short-term buffer storage or as a manufacturing support subsystem for production operations.

Modular and scalable, Multishuttle systems can be readily expanded in line with business growth.

DISCOVER DEMATIC MULTISHUTTLE SYSTEMS ▷



LEARN MORE ABOUT THE LANDMARK GROUP ▷

Setting a New Logistics Benchmark at Landmark Group

Dematic Multishuttle is a key feature of Landmark Group's distribution centre in Dubai, UAE, where garments, furniture, toys, and small goods are stored and distributed to nearly 1,400 of its retail stores or directly to consumers. The system makes maximum use of space with aisle-spanning exchanges and double-deep storage. With shuttles designed for high performance acceleration and speed and with several lifts per aisle, a single shuttle can serve between 700 and 800 storage locations. As a result, up to 15,000 totes per hour can be transported to picking stations, providing Landmark with enhanced efficiency, productivity and transparency, making this Multishuttle system the largest and fastest Dematic has installed prior to 2022.

Goods-to-Person

PROCESS ●●● HUMAN ●●● INVENTORY ●

One of the most impressive strategies for distribution logistics success uses a concept where travel is eliminated altogether. Goods-to-Person (GTP) takes advantage of the power of data combined with high-efficiency buffering and sequencing systems such as the Dematic Multishuttle.

In high-volume item picking operations, items for orders can be stored, sequenced, and delivered to workers in the order in which they need them.

In a GTP system, workers stay put in ergonomically designed high-rate workstations that optimise productivity, efficiency, and safety. The orders and items required to fulfil the orders arrive at the workstation precisely when they are needed. Workstations can facilitate discrete or batch picking, and can be configured to fulfil one or more open orders at a time, depending on order processing needs – for example whether for store, online order fulfilment, or both.

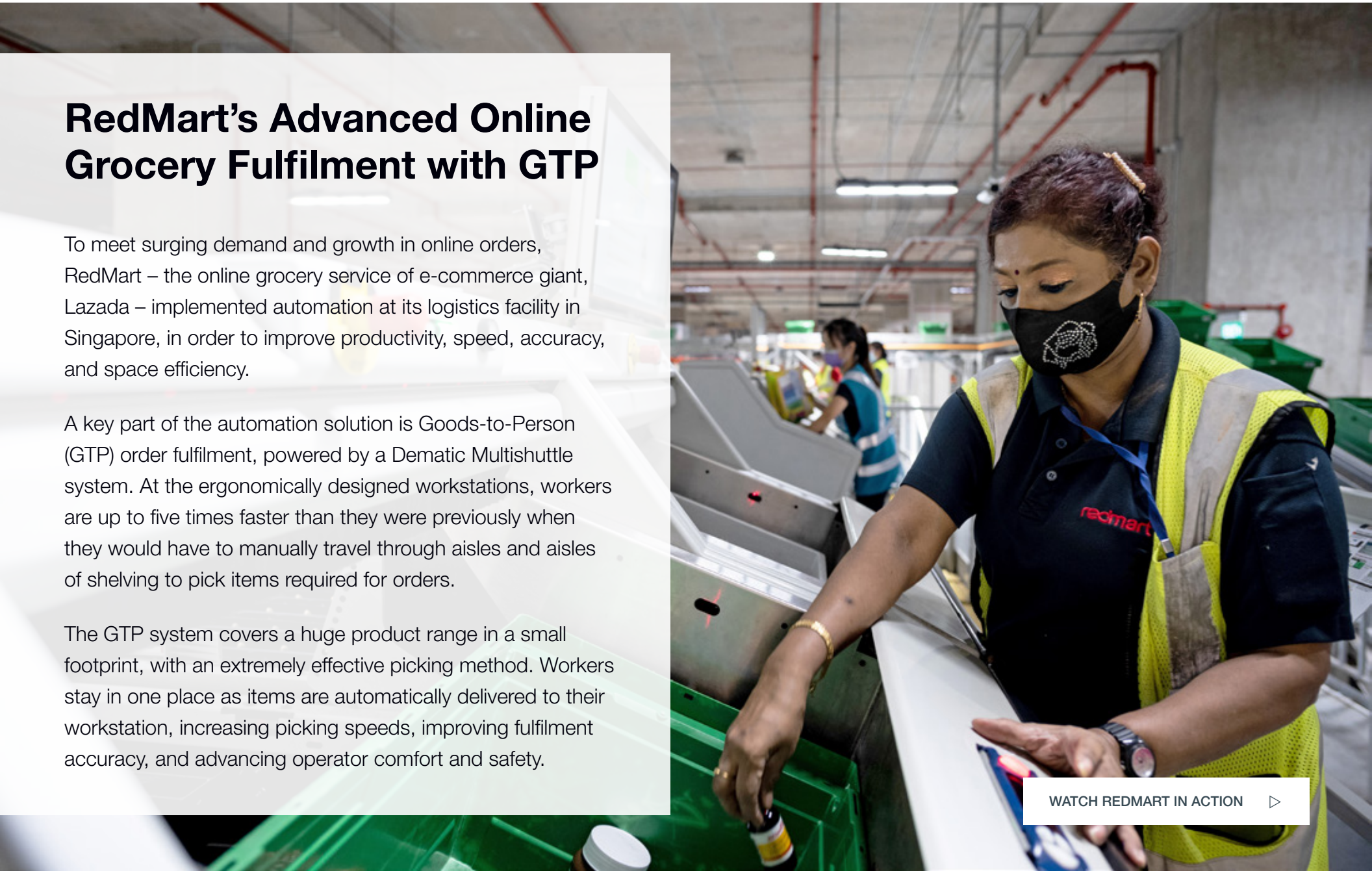
DISCOVER GOODS-TO-PERSON SOLUTIONS ▷

RedMart's Advanced Online Grocery Fulfilment with GTP

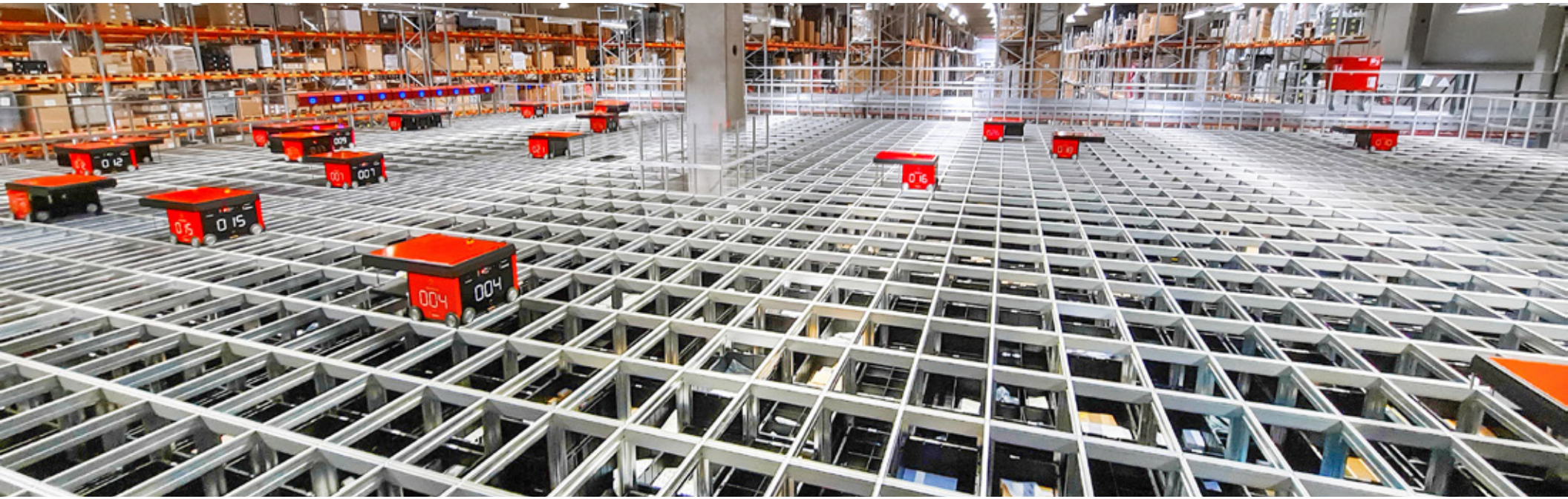
To meet surging demand and growth in online orders, RedMart – the online grocery service of e-commerce giant, Lazada – implemented automation at its logistics facility in Singapore, in order to improve productivity, speed, accuracy, and space efficiency.

A key part of the automation solution is Goods-to-Person (GTP) order fulfilment, powered by a Dematic Multishuttle system. At the ergonomically designed workstations, workers are up to five times faster than they were previously when they would have to manually travel through aisles and aisles of shelving to pick items required for orders.

The GTP system covers a huge product range in a small footprint, with an extremely effective picking method. Workers stay in one place as items are automatically delivered to their workstation, increasing picking speeds, improving fulfilment accuracy, and advancing operator comfort and safety.



WATCH REDMART IN ACTION ▷



AutoStore™

PROCESS HUMAN INVENTORY

AutoStore is an all-in-one storage buffer and order fulfilment solution. Offering ultra-high-density automation storage for small items, an AutoStore system can reduce space requirements down to 25% compared to conventional storage. AutoStore systems provide a highly efficient goods-to-person order fulfilment operation that eliminates dedicated pick locations and worker travel time and provides excellent product security, increased order processing speed, and improved order accuracy.

With a flexible, modular design, AutoStore systems can fit into existing facilities, around building columns and in compact spaces, and be readily expanded as required.

DISCOVER AUTOSTORE POWERED BY DEMATIC ▷

More Capacity in a Smaller Footprint at Siemens WKC

At the Siemens WKC electrical equipment manufacturing facility in Chemnitz, Germany, the existing manual shelf storage system for small parts had reached its capacity limits. To prepare for expected growth, Siemens WKC switched to a goods-to-person piece picking solution featuring an AutoStore system provided by Dematic.

The compact piece picking solution improves the use of warehouse space while automating picking and material flow for production. The AutoStore system includes more than 45,000 bins for storing parts. In addition to time and cost savings, the solution provides increased capacity, higher storage density and a reduced error rate for assembling components.

SEE SIEMENS WKC IN ACTION ▷

Sortation

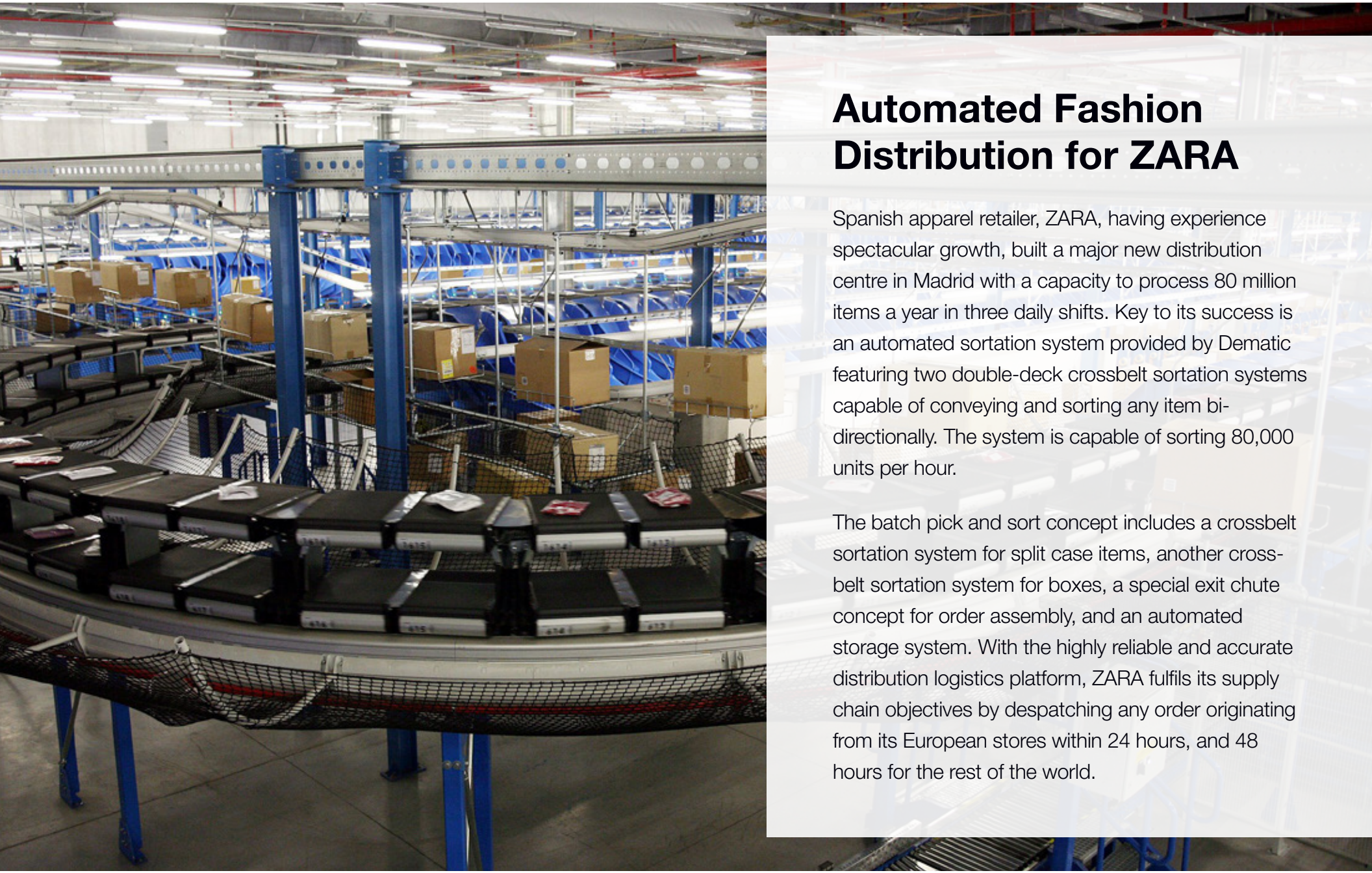
PROCESS ●● HUMAN ●● INVENTORY ●●●

Another strategy for improving item-level order fulfilment productivity is to have workers pick multiple orders at once by combining orders for several customers into a batch. Batch picking for multiple orders significantly increases productivity and throughput. Smart sortation systems can automatically sort the picked items to individual orders.

Sortation systems are typically implemented for store-fulfilment, and can be expanded with put wall systems to accommodate online orders for omnichannel (store and online) fulfilment operations. Items for online orders are sorted to put walls where workers, directed either by lights or voice terminals, sort them into individual orders.

Sortation systems can also be used to sort cartons, totes, and satchels to different locations within a warehouse or distribution centre or to delivery vehicles.

DISCOVER DEMATIC SORTATION SYSTEMS ▷



Automated Fashion Distribution for ZARA

Spanish apparel retailer, ZARA, having experience spectacular growth, built a major new distribution centre in Madrid with a capacity to process 80 million items a year in three daily shifts. Key to its success is an automated sortation system provided by Dematic featuring two double-deck crossbelt sortation systems capable of conveying and sorting any item bi-directionally. The system is capable of sorting 80,000 units per hour.

The batch pick and sort concept includes a crossbelt sortation system for split case items, another cross-belt sortation system for boxes, a special exit chute concept for order assembly, and an automated storage system. With the highly reliable and accurate distribution logistics platform, ZARA fulfils its supply chain objectives by despatching any order originating from its European stores within 24 hours, and 48 hours for the rest of the world.

Robotic Picking

PROCESS ●●● HUMAN ●●● INVENTORY ●

With advances in machine learning software, buffering and sequencing technologies, vision recognition systems, and high-speed articulated robots with versatile gripping tools, fully automated robotic picking systems are now capable of handling a diverse range of products. Robotic each picking can replace manual picking to provide highly accurate and predictable throughput, with 24/7 operation and increased system reliability and resilience.

DISCOVER DEMATIC ROBOTIC SOLUTIONS ▷

Driving Innovation at Bolloré Logistics

Bolloré Logistics is a global leader in international transport and logistics as well as a Tier 1 partner to some of the world's renowned brands. Its operations in Singapore are the largest in Asia-Pacific and form a key regional centre for the group. The Bolloré Blue Hub facility is the largest and most advanced facility in Asia, designed and built from the ground up to accommodate omnichannel distribution and growing demands of e-commerce fufilment.

The facility features a fully automated Dematic Multishuttle and goods-to-person order fulfilment system. To further drive innovation, Bolloré Logistics and Dematic introduced robotic picking into the facility support 24/7 picking.

SEE BOLLORÉ LOGISTICS IN ACTION ▷

Mixed Case Fulfilment

PROCESS HUMAN INVENTORY

Mixed Case Fulfilment solutions dramatically reduce picking labour and rapidly build high-density, store-ready mixed-case pallets and cages. Fully or semi-automated palletising options handle a wide variety of packaging material and shapes.

The solutions are highly accurate and compact to provide very high capacity and throughput levels in a reduced footprint.

Intelligent software manages the entire operation, including building high-density pallets that match store planograms and account for crushability and product mixing restrictions.

DISCOVER AUTOMATED FULFILMENT ▷

Building Store Friendly Pallets for Woolworths

Australia's largest supermarket, Woolworths Group, is currently transforming its supply chain network by adopting high levels of automation for its distribution centres. As a trusted partner, Dematic is implementing an automated fulfilment system at Woolworths' new National Distribution Centre (NDC) in Moorebank Logistics Park, Sydney.

The 40,700 square metre NDC will feature wall-to-wall automation, providing the flexibility accommodate peaks in demand, whether they are planned (seasonal spikes) or unplanned (virus outbreaks). The system will deliver store orders, with built-in scalability and modularity to meet expected growth. The Mixed Case Fulfilment solution will build store-friendly pallets for Woolworths' retail stores. The facility will handle 9,000+ products from 900 suppliers, delivering daily to over 1,000 stores nationally.

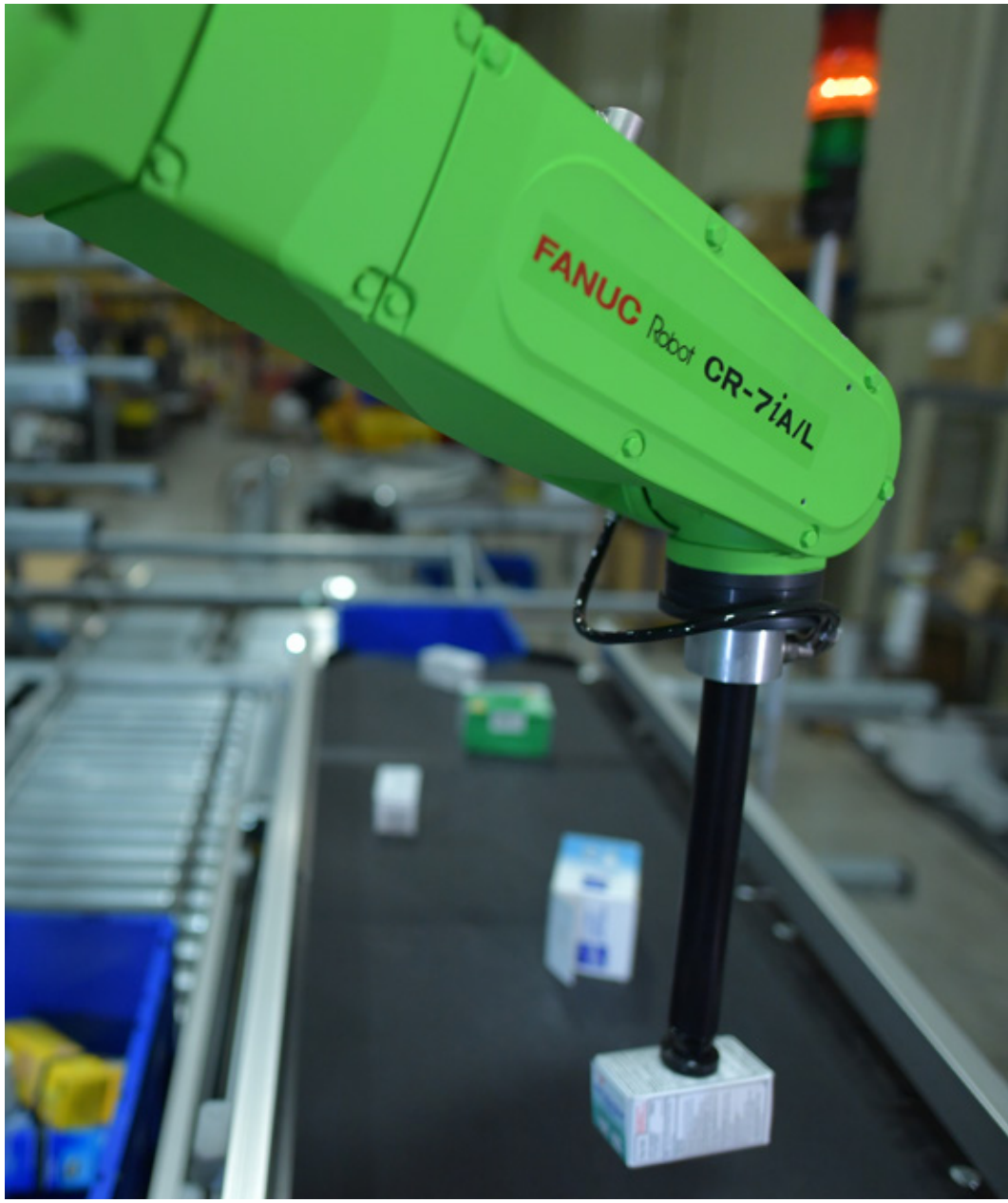
In Conclusion

Knowing which strategies to apply as well as knowing where and when to apply them is key to your business success. There is no one-size-fits-all solution – every supply chain is different, so each solution and strategy is unique. Addressing distribution challenges requires gathering information and using insights to assess multiple strategies to see how they might apply to your particular facility. Working with a provider that has a consultative approach you to establish the solution requirements and identify potential growth – backed up by extensive data analysis.

Dematic has worked with a consultive approach on thousands of projects with many of the world's most successful businesses. Dematic can provide unique global insights by focusing on optimising processes, human activities, and inventory.

Learn more about the strategies that can deliver productivity improvements for your business, building its resilience and agility.

LEARN MORE AT DEMATIC.COM ▷



About Dematic

Dematic designs, builds, and supports intelligent automated solutions empowering and sustaining the future of commerce for its customers in manufacturing, warehousing, and distribution. With research and development engineering centres, manufacturing facilities, and service centres located around the world, the Dematic global network has commissioned thousands of customer installations for some of the world's leading brands.

Headquartered in Atlanta, Dematic is a member of KION Group, one of the world's leading suppliers of industrial trucks and supply chain solutions.

Power the Future of Commerce.

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