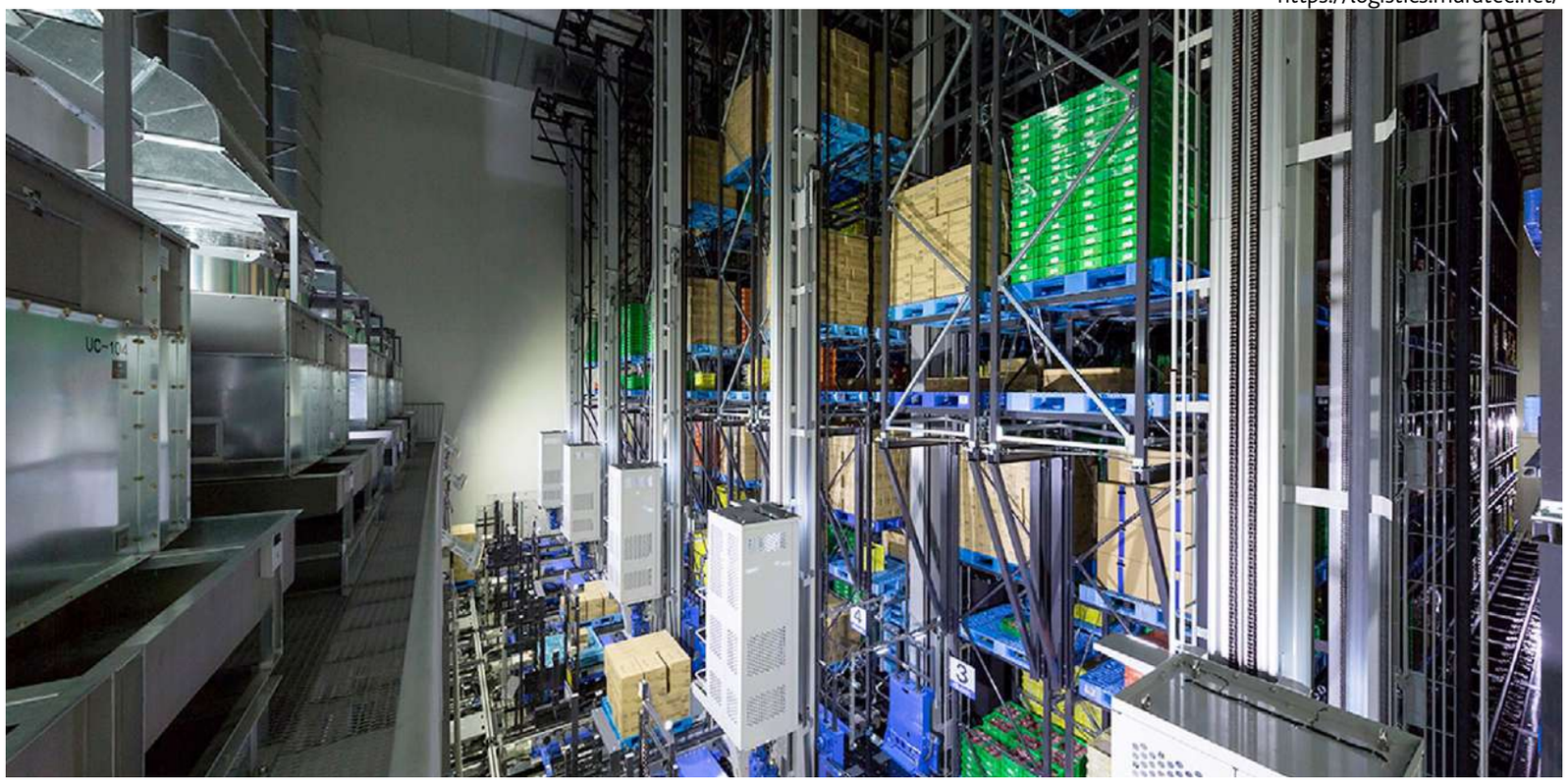
By Julia Baker

Automation in the cold chain

https://logistics.muratec.net/



The aim today is for total coordination of low-temperature warehouses – from equipment that can be used in the refrigeration and cold storage environments to three temperature zoning and traffic line design. Great efficiency is found with high-density storage variations, such as AS/RS for double-reach and hybrid storage of high-low packages, and moving racks linked with automated forklift type AGVs.

Rapid progression of technology is enabling a far different picture when it comes to the way industries are now able to function.

Automation has, for a long time, been considered a sore topic when it comes to employment, or more importantly, the loss of employment, though endless studies have shown this is not the case. In the endless cycle of rising costs, it becomes imperative to find solutions to mitigate the expenses in producing goods and their movement along the supply chain.

As the new generation of employees move in, it's becoming more evident that there is a lack of interest in monotonous work or labour-intensive work and even dangerous work, putting pressure on input costs, which is inevitably transferred onto the consumers.

A good example heard of recently is that in the UK, large global distributors are paying nearly double minimum wage to anyone that can "lift and move up to 25 kilograms of goods," as they desperately seek employees to fulfil orders, according to coldlinkafrica.co.za. Meaning that the goods will come at a premium to clients – that are already subject to increasing prices for any sort of quality product.

Automation has been initiated as a means to support consistency, improve outputs in many sectors, as well as to ease certain stressful tasks for workers.

The process began with pallet trolleys and lifts that were primarily used to load goods onto trains.

Fast-forward to current era means the impact of globalisation, development of computer technologies and growing connectivity have led to the term "supply chain management" which refers to strategy, planning and execution of the movement of goods or logistics collectively.

Looking to the future then, it is inevitable that technology will continue to support faster and more complex flows of goods, services and supplies. Moreover, evolving and emerging trends of connectivity, artificial intelligence, and automation will become a prominent element of businesses in the cold chain too.

As an FYI, fresh and frozen produce, as well as new agricultural methods such as vertical farming will also increase, as the world's population expands exponentially. By 2050 forecasts are in excess of a 20% increase to just under 10-billion people over current numbers. 25 years is a short timeframe to plan and scale everything from the field to the fork for such changes, particularly in Africa, that is known for very slow progress.

Insulated Structures

Efficiency At Work

Effective solutions to reduce the cost of in-store refrigeration

Polyurethane Injected Panels

- Standard panels: Outer and inner skin of frost white Chromodek, also available in black finish.
- Polyurethane injected panels for superior insulation and adhesion.
- High-impact PVC interlock profiles on all edges provides totally sealed insulation and a perfect vapour barrier.
- Tongue and Groove panel options available.
- Easily erected.
- Optional skin finish in Stainless Steel – Grades AISI 304 AIS 403.

Floors – Fabricated and Concrete

Fabricated Floors

- The inside floor finish is 1.5mm Aluminium tread plate glued and screwed to a marine ply base.
- Galvanised plate options available in lieu of the Aluminium Chequer Plate finish.

Concrete Floor

- Concrete floors are used for flush or step-up entry and in permanent structures. Usually a recess of 150–170mm is used to accommodate the foam slab insulation and the concrete screed.

Cold & Freezer Rooms

Meat Rails

- Hot Dipped Galvanised system.
- Support structure integrated into insulated panels.
- Optional free-standing continuous galvanised system with bends and switch gear.

Aluminium Chequer Plate

- Installed as an option to protect panels from scratches and light impact damage.
- 1.5mm and 2.0mm thick options.
- Standard height 1 250mm AFFL.

Insulated Structures

Efficiency At Work

Up to 40% Energy Saving

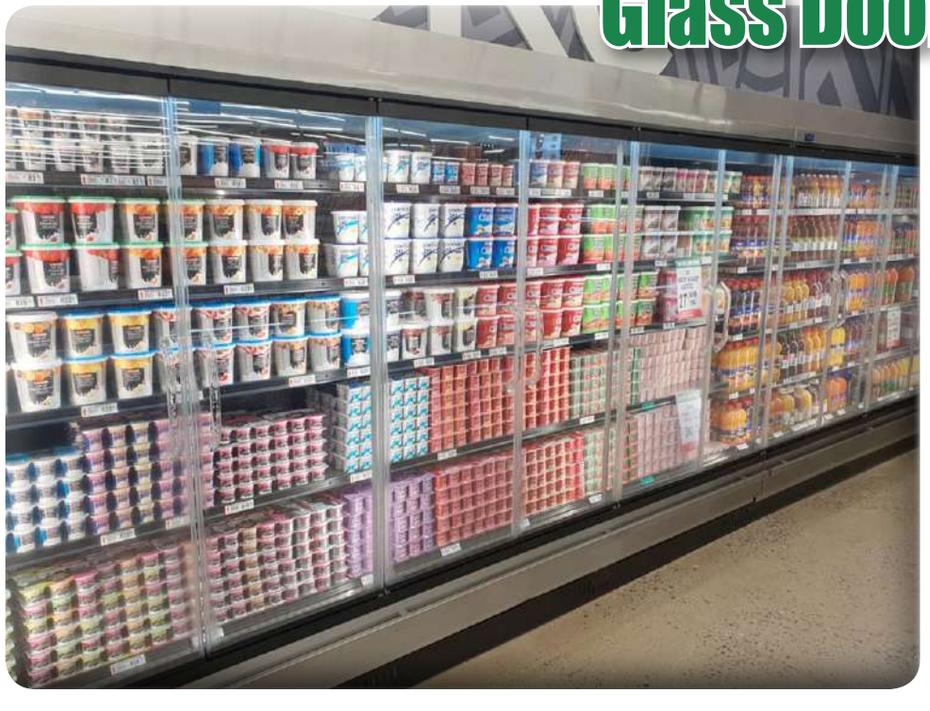
New or Retrofit Existing cases

Environment Respect

Benefits of Airshield Glass Doors

- Reduce Energy consumption.
- Extend Product shelf life.
- Double Glazed Argon filled void for better insulation.
- Optimal Product temperature.
- Glass doors have an option of Mullion lights. Quoted separate.
- Handles included.
- Up to 40% energy saving.
- Solution for new cabinets or retrofitted on existing cabinets.
- Doors are spring loaded.
- Less cold air spillage – warmer aisles.

Airshield Glass Doors



Ways to save

With energy cost rising and food retailers looking to improve the shopping experience environment for customers, Insulated Structures has developed an effective solution to reduce the cost of in-store refrigeration while enhancing the customer experience.

Insulated Structures doors are easy to retrofit on in-store cabinets to reduce the energy required to keep chilled foods at the correct temperature.

Meanwhile, customers are able to clearly see and access the products on offer. Reduced energy requirements means smaller refrigeration plant selection for new stores. These savings will off-set the initial cost of the doors. Up to 40% reduction in refrigeration requirement has been achieved.

Standard Airshield Glass Doors with a Black Frame.
Heated Hybrid also available in this design.
Heated Hybrid Glass Doors are fitted with a heater to reduce condensation on the doors in Coastal areas.
Heated Hybrid is fitted with soft closers.

Premium Airshield Glass Doors.
Frameless Door with Argon Gas filled for better insulation.

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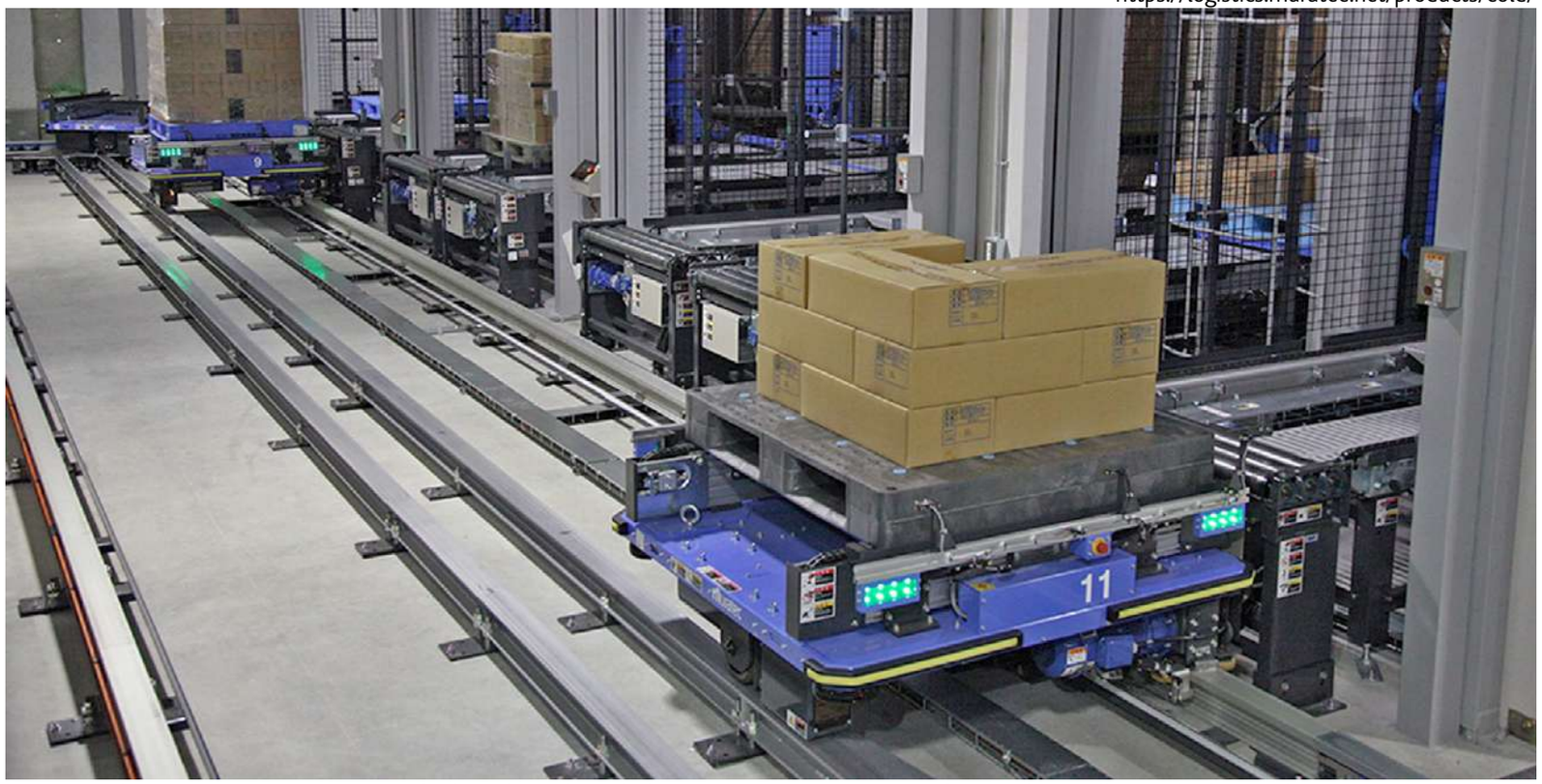

Automated transportation & sorting vehicle – the rail-guided carriage system transports heavy-duty pallets at high speed.

Continuous evolution requires continuous innovation, modern solutions and technology to enable such innovation. Covid also meant a total shift in thinking, consumption, and planning.

In terms of the growth of automation around the world, the reported market value for the sector in 2021 was nearly USD192-billion and over the next eight years, the projected value will be worth approximately USD400-billion. The demand is growing significant.

Adopting automation

In the cold chain, turnaround or handling time has become of utmost importance in quality and delivery. Automation has therefore risen as a critical element nowadays in meeting these demands.

Operators throughout the chain, face an increasingly complex decision when selecting the automation solutions that are right for their application. This can be from as early as harvesting technology, sorting lines, the choice of handling equipment, and even the newly termed 'darkstores', which are becoming more popular. Woolworths rollout being a good example.

Engaging a specialised professional consulting service is a starting point where client's particular needs are discussed and understood as each facility varies in product, volumes, size and location.

A professional provider can engage in detail for each facility – one solution may not work for all systems and locations.

A few pointers to look at ...

- Understand the particular site and operations
- Identify process improvements
- Consider different warehouse management systems, designs and automation
- Provide appropriate material handling and related equipment
- View all maintenance and service aspects of automation
- Establish protocols on risk and safety management aspects
- Compile necessary safety training and facility systems.

Consider such things as how a system is designed and installed, and the ability to effectively handle product and services with minimal intervention. With many intricate moving parts, a system's ability to continuously monitor components maximises efficient utilisation.

Automation essentially fulfils the functions for more efficient harvesting, sorting, packing and picking, rapid storage and retrieval times and safety.

Some elements of facility automation can come in a variety of solutions specific to each step in the chain. Some examples ...

- Conveyor and carousel technology
- Harvesting
- Produce sorting
- Packaging solutions
- Automated vehicles
- Processing and slaughter
- Chilling and freezing line solutions
- Pallet or carton handling
- Storage and retrieval (various racking systems/ mobiles/shuttles/moles/cranes/stackers)

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In the cold chain, turnaround or handling time has become of utmost importance in quality and delivery. Automation has risen as a critical element in meeting these demands.

Levels of automation

The concept of automation is often mistaken because people often think of robots running around taking over jobs and society. Automation is, according to International Society of Automation, "the creation and application of technology to monitor and control the production and delivery of products and services." While also controlling outcomes more precisely and generating data sets.

Basic automation systems use appropriate machinery and equipment, as well as certain vehicles to reduce human involvement on repetitive tasks. Advanced systems, take advantage of numerous technologies and include the use of some robotics and many times, artificial intelligence.

Combined order automation would rely on software, machine learning, robotics and data analytics to automate tasks and procedures.

Mechanised warehouse automation uses technology, equipment and systems to assist workers with tasks and procedures.

Building the warehouse of the future. The art of forecasting the future is all about simultaneously recognising patterns in the present and thinking about how these changes will impact the future so that they can be actively engaged in building what happens next. There is a need to examine emerging trends and create opportunities to collaborate and plan ahead with those in other fields. Companies must develop new capabilities by combining an entrepreneurial spirit and creative perspectives with logic to keep a step ahead every day. www.youtube.com/@NewCold-global

Advanced automation combines systems and technologies that can entirely replace labour-intensive human workflows.

Automation technology types

Workflows and processes that can be streamlined to operate efficiently and scale correctly to changing demand. The higher the turnaround the greater the benefits in cutting down on human errors.

Drones and robots. As one of the most advanced automation systems in the world currently, is the use of drones and robots which has seen significant growth in numerous fields. In the world of harvesting, these technologies can more effectively work through orchards, sort on site, reduce damage to produce and also determine optimal picking times based on for example sugar content of the fruit, or specific set colouration. Down to the detail of reading when a plant needs water, setting off sprinklers.

Mobile devices, including smartphones and tablets, barcode scanners, and GPS technology, which is critical for a WMS.

Goods-to-person fulfilment increases efficiency and reduces congestion, these include conveyors, carousels and various lift systems. GTP systems can double or triple the speed of picking and packing.

Automated storage and retrieval systems (AS/RS) are a form of GTP fulfilment technology that includes automated systems and equipment like material-carrying vehicles, tote shuttles and mini-loaders to store and retrieve materials or products.

Is your ventilation system dirty?

CONCEPT CLEAN AFRICA is highly specialised in solving indoor air quality problems due to an ever-demanding need to minimise elevated levels of circulating dust and bacterial contaminates present in HVAC systems.

CONCEPT CLEAN AFRICA provides customers with the following specialised cleaning services …

- HVAC duct cleaning & sanitation services (Using an EPA registered sanitiser / biocide
- Indoor air quality management services
- Deep cleaning to kitchen extraction systems
- Fire & flood restoration services
- High-level structural cleaning services.

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Non-insulated ductwork before & after cleaning.

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Our expert deep cleaning service is a sure way to remove all potentially harmful burned on carbon and fat deposits from kitchen cooking and extraction equipment which can cause kitchen fires and pest infestations.

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CONCEPT CLEAN AFRICA are the trusted name in air duct and HVAC cleaning because we utilise industry-leading methods, advanced technology, and effective techniques.

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Automatic guided vehicles (AGVs), a mechanised automation which uses magnetic strips, wires or sensors to navigate a fixed path through a warehouse. AGVs are generally limited to large, simple operations environments designed with an appropriate navigation layout. Not all complex warehouses can use this system.

Autonomous mobile robots (AMRs) more flexible than AGVs, AMRs use GPS systems and AI to move around effectively where there is more human traffic. AMRs can identify information on packages to assist with sorting and inventory checks.

Pick-to-light uses mobile barcode scanning devices and light displays to direct warehouse pickers where to place or pick up selected items. They can dramatically reduce searching time and human error in fast paced and high-volume situations.

Voice picking and tasking, utilises speech recognition software and mobile headsets, which eliminates the need for handheld devices like RF scanners.

Automated sortation systems, a conveyor-type system and diverting them to a warehouse location using RFID, barcode scanners and sensors, a system used in to complete, picking, packing and shipping. Sorting systems can also extract any sub-standard quality product at source to ensure only the unspoilt goods get past the initial stages before handling even starts.

AI and internet of things (IoT). The next step, not scary, just a reality. Artificial intelligence and IoT both provide data and analyse to make advanced predictions that weren't previously possible.

Augmented reality (AR) technology involves using a camera to capture a real environment, such as an aisle in a warehouse, and then overlay instructions or information on that environment, on a mobile device. AR smart glasses are available to go 'free hands', which can be used even for training lift truck operators to making safe deliveries. It may sound like science fiction to some, but it is a reality. VR technology is not just a game.

Where does WMS fit in?

WMS (warehouse management system) is a set of policies and processes which organises a manufacturing facility, warehouse or distribution centre, becoming the most commonly automated facilities in South Africa. A WMS tracks all materials and goods as they come in and go out of a facility.

A WMS understands 'where everything is' to reduce any latency, processing costs and human errors that could affect profitability.

Many WMS integrate with transportation management and logistics software, incorporating multiple systems, creating bills of lading, picking lists, and invoices for shipments automatically, as well as sending out automatic shipment notifications.

There are two types of WMS, firstly an integrated WMS, which allows one to identify high turnaround products but low profit margins, as well as low volume movers with high profitability.

The second, a standalone WMS, primarily serves the function of warehouse management. Though it may have limited functionality, such as inventory or accounting, it is tailored to specific functions.

A WMS on-premises or cloud-based solutions is up to the operation. An on-premises WMS would be responsible for hosting and maintaining both the hardware and software, which can have a large upfront cost, while allowing complete control. Cloud based allows more freedom and outsourcing advantages.

And then, the challenges of automation

Automation at any level is still a growing challenge, still in its infancy in South Africa, we may be a bit behind, but we are certainly up to the game in adopting the full potential of automation technologies. Significant capital investment is required to get up and running and scarce expertise to establish and maintain the system doesn't make it any easier.

To remain competitive is a major factor for businesses that want to remain competitive both locally and for the international markets. To grow along with automation is a 'non brainer' to keep up with operational efficiency.

Technology will take us to higher heights. It is not a scary ride, but an exhilarating ride. SR

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