



The tight delivery schedules of dairy products demand a system whereby orders can be dispatched quickly and flawlessly.

Cimcorp's scope of supply for Valio:

Distribution centre automation for Jyväskylä and Riihimäki dairies including

- systems planning and simulation
- equipment design
- project management and start-up
- MultiPick robots for full crate order picking
- MultiplePick robots for mixed crate order picking
- conveyors and transfer cars
- Cimcorp WCS warehouse control system, which controls all order picking operations (roll-in container order picking, full crate order picking, mixed crate order picking and manual order picking) and the total flow of material (infeed, order consolidation)
- customer training
- on-site equipment maintenance

Effective order picking guarantees fresh milk on the shop shelves

In the Valio distribution warehouse in Jyväskylä, countless stacks of crates tower over two metres high under massive robot frames. The familiar blue milk crates have been joined by new white crates. Both are collected by Multi-Pick robots.

There are six robots for picking full crates. At the end of the floor storage six MultiplePick row pickers collect cartons for mixed crates by lifting them five cartons at a time by their gable-top.



Dollies are filled briskly and for a good reason, because over 100 000 order rows of products are collected every week at Jyväskylä. Order picking begins every weekday morning at six o'clock. It is quieter in the mornings, since some of the robots are replenishing and organizing the stock. From ten o'clock all the robots are deployed for order picking until the early hours of the morning, some of them around the clock. Apart from Saturday evening and weekend nights, the robots work non-stop.

A quick delivery speed is an absolute must in the production of fast-moving dairy products.

“Within two hours maximum of receipt of order, the goods are ready for loading,” says logistics manager Heli Jaatinen.

Efficient use of space

Behind the wall is the old distribution warehouse, where one year ago order picking was being handled not by robots but by over 30 workers per shift. Now in the same warehouse considerably fewer personnel are re-

quired for the order picking of cheeses, butter and margarine, which are still handled manually due to the cardboard packaging.

Previously these products were picked in separate buildings, so warehouse operations were divided into two different places.

“Thanks to automation we have got all material operations under the same roof. That has made a big change.”

All products can now be loaded onto trucks at one time. Furthermore, during the automation process, a rollable system was introduced thanks to reusable dollies. Whereas earlier, yoghurts and quarks etc. were packed on pallets, now they are packed on dollies with wheels. The use of the transport space has been streamlined, now that the new packages can be loaded into the truck if necessary on two tiers.

Delivery reliability maximized

The warehouse automation is part of the development program for fresh products initiated by Valio in 2000. Valio decided to concentrate the production and distribution



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► warehousing of dairy products in Jyväskylä, Riihimäki and Oulu and to invest in cutting-edge dispatch and order picking technology.

The change led to the expansion of the distribution areas of the remaining locations, which required a great deal from the distribution system. For example the Jyväskylä distribution area encompasses the whole of central Finland, from Ilomantsi in the east to Vaasa in the west.

“Automation has played a large role in this development program. Although we cover a really wide distribution area, we need relatively few pairs of hands. It will of course take a few years for the system to pay itself back, but after that it is all savings,” states Jaatinen.

The robots were installed in the spring of 2004. The first products were picked automatically over a year ago, since when robot order picking has been phased in one product group at a time.

Implementation of the new system has brought flexibility to the delivery process.

“Certain customer-specific models can be programmed into the system. In manual order picking, customer-specific operations were

dependent on the memory of the order pickers and sticky notes.”

Jaatinen is also delighted with the high standards of delivery precision.

“The delivery reliability of Valio was pretty good before, but after the introduction of the new system the number of order picking errors has fallen. The system only makes a mistake if the operator does something wrong.”

New tasks

Valio receives the majority of orders in e-form. Orders received from the SAP system are transferred to the Cimcorp WCS warehouse control system that controls automated order picking.

When the robots have collected the products onto the dollies, the order is transferred out of the system. At this stage, an acknowledgement is sent to the SAP system, which prints out the delivery note for the customer. The warehouse operative attaches it to the filled dolly and takes the dolly to the loading bay to await transport.

The system operators, who work in three

shifts, monitor and guide order picking from the control centre. There are cameras situated around the warehouse, enabling the monitoring of the system operations even in places that are not visible from the control room.

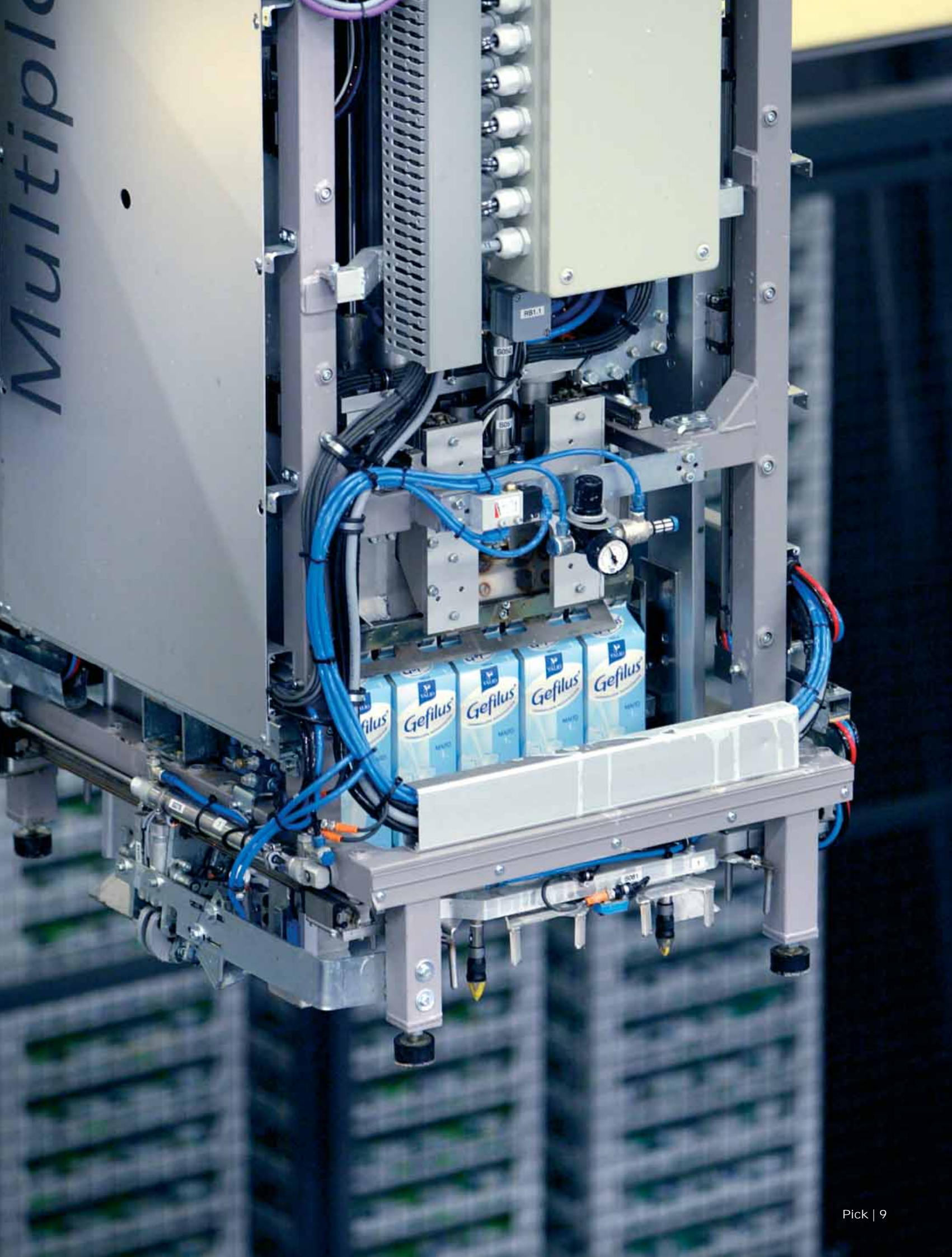
Jaatinen says that in addition to cost effectiveness, automation has made working in the warehouse more pleasant for the operatives.

“Job satisfaction has increased. Earlier workers used to say that there were no challenges in walking around the warehouse with a list. Now they have more demanding jobs, requiring technical skill.”

Replenishment and order picking

MultiPick robots replenish the floor storage twenty-four hours a day. Products come from the production side in dollies along conveyors to the warehouse. The product data is entered into the system by the packaging machine operative in the production department.

In the warehouse, the height of the stack is read automatically and the incoming goods are registered in the WCS system. The dollies ►



Multiplo



► are transferred by transfer cars that move on rails to the automation system conveyors, from where the robots pick up the product stacks and move them to the floor storage to await order picking.

The system allows the products to be positioned on the floor in product groups so that the robots have the shortest distance to pick the most popular products, such as

milks. Products that are in less demand, are placed at the edge of the area.

Batch-specific data on the products can also be defined in the system. For example, UHT products require a certain quarantine period, so a picking ban can be programmed for them until all their test results have been received.

Tracing products

Milk, sour milk, cream and special milk are produced at the Jyväskylä dairy. The Riihimäki facility produces yoghurt, Helsinki juice, and Oulu the Finnish cultured milk product, viili.

When a consignment of packaged products from elsewhere arrives at the reception area, the warehouse operative puts the products onto the conveyor one dolly at a time, reads the product code, the best before date and the height of the stack.

“Once the stack has been entered in the system, we always know which product and date stamp is in the stack, and where it is

going. The stacks are reduced from the balance of the floor storage, as they leave to fill orders.”

The route of every product from production to customer is saved in the memory of the order picking system.

“If for some reason you want to track a product right up to the customer, the system can subsequently provide important information on the route it took.”

At present, order picking is automated in Valio’s largest distribution centres in Jyväskylä and Riihimäki. Order picking is done manually in the other locations.

“The majority of order picking is now handled using robots. The acquisition of automation systems for Jyväskylä and Riihimäki has been a huge investment for Valio, and expectations are high. We believe that with this automation we will be one of the pioneers in warehouse operations automation in Finland and the whole of northern Europe.”

TEXT | SARI LOMMERSE PHOTOS | HARRI PÄLVIRANTA

A challenging project

Valio took a giant stride in making a 100% switch from manual order picking to an automated order picking system. Automation required a lot of changes in the distribution warehouse. One absolute requirement was the development of packaging suitable for automated order picking for yoghurts and viili, a Finnish cultured milk product, which up to now have been packed in disposable cardboard trays.

The new packaging was a big step in itself, since it meant that all the packaging lines for the two largest production facilities had to be modernized.

The result of development work was the returnable dairy crate. A display tray was designed to go inside the crate, keeping the yoghurt cartons upright.

Since the packaging was designed alongside the automation of the distribution centre, it could be developed to be compatible with the equipment. On the other hand, it was possible to take into account the requirements of the packaging while developing the equipment. In this way, the optimal method of how the robots grip the unit and how the grip is directed could be developed.

“The structure of the tray and the gripper should definitely be developed simultaneously. When we had the opportunity of collaborating with the robotics supplier during the design of the packaging, the tray gripping was highly successful,” says Aki Liukko, a logistician from Valio.

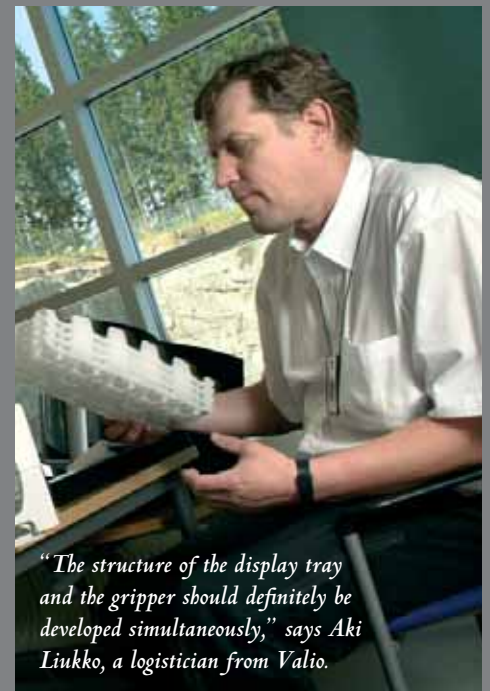
New row gripper for the dairy business

The biggest challenge in the automation project was to develop a system, whereby split crates could be collected. Cimcorp developed the MultiplePick row gripper for this task, with which one or more rows can be picked from inside a full crate. The development work gave rise to a patentable product for Cimcorp.

Row gripping is suitable for the row-by-row order picking of gable-top packages, such as juice cartons. It can grip one-litre, half-litre and two decilitre packages. The gripper can also pick products supplied in display trays such as yoghurts.

Liukko says he is delighted with the end result.

“It is difficult to grip cartons, because they are packed in the crate loosely enough that they can move a little. However, it was possible to set such wide removal tolerance for the gripper, that the cartons were easy to take out of the crates.”



“The structure of the display tray and the gripper should definitely be developed simultaneously,” says Aki Liukko, a logistician from Valio.

One of the future challenges for Valio in automation is the order picking of products with a rapid turnaround time according to the date stamp.

“There are several date stamps in the system for the same product. Management of situations when the same product is located under more than one robot, still needs development”.

TEXT | SARI LOMMERSE PHOTO | HARRI PÄLVIRANTA