

# Goods-to-Person Fulfillment System Increases Productivity & Accuracy

Shimano, a world-leading manufacturer and distributor of high quality cycling and fishing equipment and accessories, operates a distribution center that incorporated goodsto-person workstations supported by Dematic Multishuttle inventory storage sub-system.

# The Challenges

A key goal for the project was to bring distribution for Shimano's cycling and fishing businesses under the one roof. This would enable both to enhance the quality of their service to customers and create economies-of-scale, which would reduce distribution costs.

While each business distributes a unique range of products and services a completely different customer base, there was a synergy: Both handle a lot of relatively small products, parts, and components.

## The Solution

An essential feature of the new DC is its Dematic Multishuttle® goodsto-person (GTP) order fulfillment system. The Multishuttle occupies just 2,100 square feet of floorspace; the GTP workstations and conveyor also taking up around 2,100 square feet of floorspace.

This space efficient, double deep, single-aisle inventory storage buffer system houses a total of 5,168 totes over 16 levels — each level serviced by its own shuttle.



Shimano uses voice-directed picking for case and small bulk picking.



An overview of the three Goods-to-Person workstations and one Quality Assurance workstation adjacent to the Dematic Multishuttle system.

## **Tote Put Away**

The Dematic iQ software automatically adjusts stock locations on a dynamic basis. Each time a SKU is retrieved, the software examines how often the SKU is required, and puts the tote away accordingly. Fast-moving SKUs are stored towards the front of the system making the retrieval time quicker; slower-moving SKUs are stored towards the rear.

Easily removable dividers allow each tote to store one, two, four, or eight SKUs, with the Multishuttle system housing more than 4,600 SKUs.

#### **Multishuttle System Operation**

The Multishuttle system supplies approximately 200 totes/hour to each GTP workstation. When stock is retrieved from the Multishuttle system, it is delivered to the GTP workstations as required for order assembly, ensuring very high productivity and throughput rates.

Two lifts service the Multishuttle system. One lift feeds totes into the aisle and the other feeds totes out. Each lift is capable of handling two totes at a time.

### **Dual-Purpose Workstations**

Each of the three workstations is dual purpose. They can be used for picking and for replenishment. The system is designed to support between 200–350 picks per hour per workstation. Some operators achieve up to 600 picks per hour.

The GTP workstation configuration presents to operators a single stock tote



Pick-to-light displays at each of the six order locations display the number of items required for each order, enhancing accuracy.



Each of the three Goods-to-Person workstations are dual purpose, which means that they can be used for picking or replenishment.



Orders pass through an in-line packing station before continuing on to an eight lane conveyor sortation system.

together with six order cartons — three on either side of the workstation. This eliminates time wasted travelling, locating, and identifying stock, and it enables multiple orders requiring the same SKU to be fulfilled concurrently.

## Accurate Order Picking

When a tote arrives at the workstation, a monitor displays an image of the SKU along with the quantity of items to be picked. Pick-to-light displays at each of the six order locations display the number of items required for each order, virtually eliminating the potential for picking errors.

Operators work in parallel at the three workstations, unaffected by each other's pace, and the workstations can be opened and closed when needed for a particular shift. The system provides full redundancy as orders can be processed at any location, with all workstations operating independently.

## Split-Case Order Processing

More than 55% of the DC's orders require items from the Multishuttle system. Orders are typically launched at a GTP workstation and after the GTP portion of the order is complete, operators simply push the carton onto a central take-away conveyor.

Slower-moving split-case SKUs and items not suitable for storage within the Multishuttle system are stored within a combination of shelving and selective pallet racking.

After all of the required SKUs from the GTP system have been picked, an integrated conveyor system transports the order to other areas of the DC where any additional SKUs for the order are picked using a voice-directed picking system and added to the order. After all of the split case items for an order have been picked, the carton is conveyed through an inline packing system where the carton is void filled, sealed, and labeled for shipping.

The completed order is then conveyed to an eight-lane sortation system, which sorts the carton to the appropriate shipping lane where it will be palletized for shipping.

## Integrated System Software

Shimano's Warehouse Management System (WMS) is responsible for overall inventory management and stock movements, order management, and replenishment requests to the GTP system. The WMS is also responsible for SKU management including capturing of weight, dimensions, and photographs of SKUs, which are displayed during the picking process at the GTP workstation to verify the correct product is being picked.

Dematic iQ Warehouse Control System (WCS) is responsible for all picking in the DC and all activities relating to the GTP system including picking, replenishment, stock control, and location management within the Multishuttle system. Dematic iQ WCS also controls the real-time flow of orders through the GTP workstations, as well as voice-directed picking in the DC's shelving and racking areas. It also controls the flow of orders through the conveyor system to shipping.

Orders that require only GTP items (about 55%) are released for picking as required; orders requiring part GTP and part bulk (about 45%) have the GTP portion released first and as picking nears



More than 55% of the DC's orders require items from the Multishuttle goods-to-person system.

completion the bulk requirements are released for picking.

Dematic iQ performance optimizing software provides full track and trace capabilities for every single carton and optimizes operational processes from planning to order fulfilment and shipping within a single flexible, scalable ,and modular platform. It also provides visibility and insight into system performance via intuitive dashboards on computers, laptops, and mobile devices.

## **Future Growth**

The Dematic system layout was designed with expansion in mind. Space has been reserved adjacent to the Multishuttle system for a future aisle, which would provide 50% more storage capacity, together with additional workstations to enable a further increase in throughput.

# The Results

- Put-away process ensures inventory accuracy, reducing risk of stock outs
- Dynamic software adjusts tote putaway strategy, thereby increasing tote retrieval efficiency
- Improved inventory management with ongoing check weighing and cycle counting
- Delivers SKUs to GTP workstations in the exact sequence to optimize order assembly



Members of the Shimano warehouse management team

- Dual-purpose GTP workstations suitable for both picking and replenishment
- Intuitive, easy-to-learn system, with just one hour picking/packing operator training required
- Goods-to-person system provides full redundancy as orders can be processed at any location

### **Operations Overview**

- → 5,186 Totes on 16 Levels
- → 4,600 Stock Keeping Units (SKUs)
- → 3 Dual-Purpose Workstations
- → 200–350 Picks per Hour per Workstation

