Rainbow Resource Center Increases Order Fulfillment Efficiency 50% While Reducing Labor by 30%

- **70% Productivity Increase**
- **Eliminated Labor**
- **Elimination of Bottlenecks**
- **99.9% Order Accuracy**
- **Automated Weigh & Vision Quality Control**
- **Real-time Labor Management**
- **Real-time Operation Performance Visibility**

Rainbow Resource Center is a leading provider of educational materials and supplies for the home school market. Founded in 1989, the company sells and distributes homeschooling educational products throughout the USA from their Toulon, IL warehouse facility.

Challenge

Steady yearly growth, compounded by a surge in the movement for home education during COVID restrictions, outstripped Rainbow Resource Center's ability to keep up with order fulfillment expectations.

The company added a second shift operation to meet order shipment demand and made limited investments in packaging automation, but picking still relied on a highly labor-intensive paper-based picking process.

Every day, 5,000 or more orders were printed on multi-form pick-pack sheets and manually sorted into batch waves to attempt to build a batch of orders optimizing the operator's warehouse travel path. The pick-pack sheets were then distributed to the order picker workers. Picking was done using a cart with 3-4 order totes.

At pick completion, totes were brought to a team of packing operators using a dimensioning scale and a build on-demand carton erector requiring a dozen manual workstations to pack, manifest, and label orders.

The old pack and ship processes were both labor-intensive and created a bottleneck, limiting the customer's ability to operate in a single shift.

Defining the Solution

Rainbow Resource Center met with the Numina Group team to discuss several process improvement ideas, and then hired Numina to conduct a design engineering study to assess operation improvements and recommend the right blend of warehouse automation technologies needed to improve order throughput.
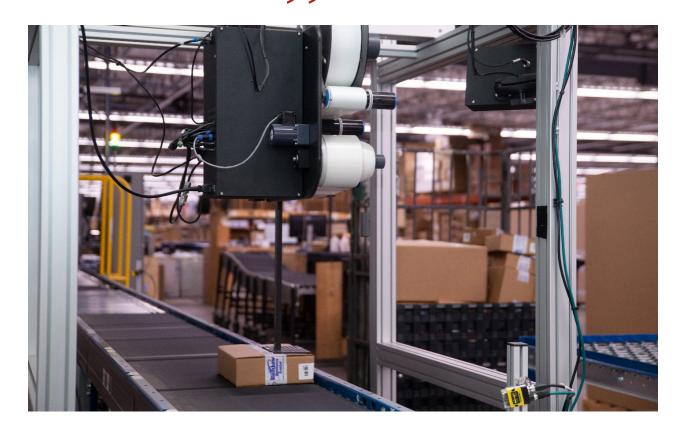
Numina's design team first benchmarked Rainbow's current order and SKU profile data and warehouse operational performance to create a plan to streamline the pick, pack, and ship processes. As an independent systems integrator, Numina reviews process improvements and, in partnership with the client, compares the various automation investment options and makes recommendations based on labor savings, throughput, operation improvement gains, and ROI.

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"As we grew, various parts of our warehouse practices needed improvements, so we contacted The Numina Group. We knew that the DC needed process changes along with automation to create the right solution."

**— Bob Schneider,
Rainbow Resource Center Owner**

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Rainbow Resource realized their workflow problems could not be resolved by simply adding more people.
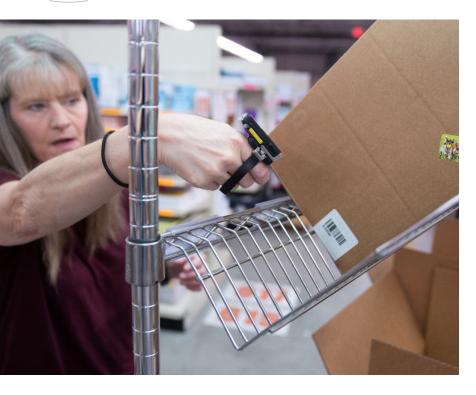
Implementing the Solution

During the final design phase, Numina reviewed how the strengths and functionality of its Real-time Distribution Software, RDS™ Warehouse Execution and Control System (WES-WCS) would interface with Rainbow Resource Center's ERP to transition to a paperless operation by adding optimized order release and pick, pack, and ship process automation modules to the current ERP platform.

> *By bolting RDS onto their existing ERP the facility gained optimized order release and a faster, more accurate picking process and increased order flow across the entire DC, streamlining the entire order fulfillment operation.*

At the completion of the design, Numina was able to demonstrate to Rainbow the recommended improvements and the anticipated savings and ROI to be achieved through the warehouse process improvements.

RDS warehouse automation software includes an advanced order release and cartonization software module that precisely calculates and pre-selects polybag package and carton order sizes to minimize parcel freight shipping costs. It works in combination with the RDS voice-directed picking suite to pick and pack directly to the right size shipping carton for the majority of the order volume.

Numina's Victory Voice™ pick-by-voice system Includes a Smart Batch Cart Picking Process:

- At order start, RDS selects and assigns 12-15 pick to carton orders based on a minimized zone-based travel path.

- "Speed picking" is used to further optimize the cart build process by selecting a mix of right size order shipping cartons and totes.

- Totes used for picking items/orders eligible to ship in padded envelopes across the multiple warehouse zones are consolidated at a pick-to-light order consolidation put wall.

- Complete orders are packed and shipped using an auto-padded bag packaging line.

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New Operation Details

1

Prior to the start of building a batch cart of orders, RDS sends the on-demand Packsize® carton erector the exact carton size required for the order content.

Operators scan the order carton barcode and are directed to place the carton onto the batch pick cart shelf position.

2

Pickers use pick-by-voice wearable mobile computers and hands-free barcode scanners to scan a pick cart and are then directed in an optimal pick-path to each location to pick, pack, and scan validate the order items directly into the shipping carton or tote.

3

A voice message and instructions are displayed on the RDS Victory Voice screen, combining barcode scanning pick-pack validation into each order-specific carton, allowing operators to work faster at a 99.98% accuracy rate. Voice has eliminated most of the secondary packing and inspection labor.

4

Orders with SKUs that are size-eligible for padded bags are picked into a tote, then consolidated at the put-to-light order consolidation wall, and packed and shipped using the auto packing and label machine.

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At pick completion, the batch cart cartons are unloaded onto the automated weigh, audit, pack-and-ship conveyor line. Cartons are scanned and weight audited. A digital image of the carton's internal content is captured to assist customer service staff in resolving any order shipment disputes.

6

After passing the weight audit, cartons transport and sort to one of the two in-line RDS packing workstations. The pack sheet auto-prints and the operators are directed to insert void fill, fold the flaps, and push the carton into the adjustable height taper-sealer.

7

Cartons exit the pack stations and are transported to the final scan-weigh-dimensioner, auto manifesting, and print-and-apply labeling system. This process eliminated 3 to 4 operators at the manual manifesting workstation.

8

Integration of a real-time manifesting system further adds savings to the operation by automating carrier rate shopping for the lowest cost shipping method, print-and-apply labeling, and label verification.

9

Successfully labeled cartons then transport and sort to the proper carrier destination.

Rainbow Resource Center's Warehouse Automation Benefits

70% Productivity Increase. The solution is a paperless process that eliminates paper printing and manual handling and sorting tasks, resulting in a faster order start operation that lowers labor and printing material costs.

Eliminated Labor. "The old process used 20 to 22 people in pack and ship. Now we can do all the work with 8 people. We needed even more temporary laborers during peak season and have virtually eliminated the need to process orders on a second shift, yielding additional labor cost savings." Joel Manning, Rainbow Resource Center Warehouse Manager.

Elimination of Bottlenecks. With RDS optimized order release, work flows more evenly through the warehouse, creating a continuous order flow operation. Bottlenecks no longer occur, and staff idle time due to wasted walking and waiting for work at manual stations has been eliminated.

99.9% Order Accuracy. The RDS Victory Voice Suite incorporates hands-free barcode scanning to direct operators to efficiently validate items picked and eliminate the need for secondary inspections. Operators work faster with 99.9% picking accuracy.

Automated Weigh & Vision Quality Control. RDS includes a scan-weigh-vision capture to perform a carton weigh-audit of the pick to carton items. Additionally, an overhead camera captures a digital image of the carton contents. Cartons that fail the weight audit are diverted to a QC audit workstation prior to the in-line pack stations carton sealer.

Real-time Labor Management. The RDS Labor Management Module provides visibility into workers picking and packing performance. "Now we can see employees' picking rates, accuracy, and other factors and review them with the team. I can identify our top performers and place them where they're needed most," said Joel Manning.

Real-time Operation Performance Visibility. RDS tracks, timestamps, and records order movement throughout the pick, pack, and ship operations. "Now, when a customer calls, our customer service team has visibility and can log into RDS and tell them exactly where their order is in the process, which is very important," Joel Manning said.
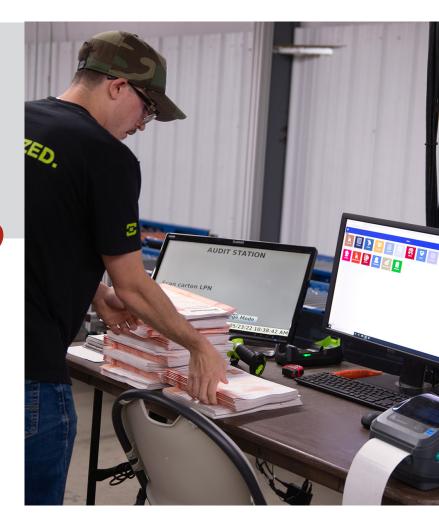
Summary

Rainbow Resource Center has achieved its goals of improving productivity, lowering labor costs, and enhancing its ability to serve its customers, which are, as Joel Manning stated, "the company's most important goals for investing in warehouse automation."

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"Having weight exception orders reviewed before they are packed and shipped has caught picking mistakes, reducing our shipping error rate."

— Joel Manning,
Rainbow Resource Center
Warehouse Manager

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"There are calculable benefits beyond the labor cost savings. We really wanted to make sure that we are servicing our customers the best we can. Goodwill and great and quick customer experience are very important to homeschooling families who expect orders to ship within 24 hours," he said. "Having repeatable and reliable performance from the Numina automation solution created a best-in-class warehouse operation, which is very important for better serving our customers."