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Warehouse of the Month Crate&Barrel

This retailer of housewares handles its store distribution while also processing catalog, e-commerce, and gift registry orders – all from one DC.

By David Maloney, Senior Editor Modern Materials Handling April 1, 2001

Many retailers have discovered that making the jump to e-commerce is not nearly as easy as they expected. Some tried to fill Internet orders from existing DCs only to realize quickly that the processes required for e-fulfillment are radically different from their accustomed retail distribution. Others solved this dilemma by constructing Web-only DCs, only to find that predicting the proper capacities to meet Internet demands was anybody's best guess.

Crate&Barrel, however, chose a path less followed, and as it turned out for them, much smarter. This housewares retailer now performs both its store and direct-to-consumer distribution from one new DC, but maintains separate processes for each. Efficiencies are gained as retail and direct fulfillment functions now share a common inventory, as well as use the same receiving, storage, sortation, and shipping areas. Transportation costs have also been reduced, throughput is up, customers are better served, and there is more room for growth.

Crate&Barrel began 40 years ago in the Chicago area and now operates 93 retail outlets nationwide, with heaviest concentrations in the Northeast, Midwest, Texas, and California. Stores sell dinnerware, linens, home accessories, bedding, furniture, and lamps.

Most stores had previously been supplied from a 160,000 square-foot DC near headquarters in Northbrook, Ill. But the company outgrew the available space there, had difficulty finding adequate labor, and wanted to increase its ability to add materials handling automation. It also sought to incorporate its direct fulfillment operations, which includes Internet orders, catalog sales, and gift/bridal registry. These orders had to be processed elsewhere, which increased transportation requirements.

In 1998, Crate&Barrel built a 450,000 square-foot facility in Naperville, Ill to assure room for growth and meet the company's distribution goals. The new building includes wider aisles for easier truck movement, improved lighting throughout, multi-level pick modules, increased automation with 3 miles of conveyor and a sliding shoe sorter (Automation, www.automationconveyors.com), and an open design that offers efficiencies and flexibility (Sedlak Management Consultants, www.jasedlak.com).

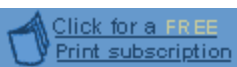
'We built a lot of flexibility into the system,' says Dan DeGross, manager of warehouse operations for the housewares division. 'The business was growing at a nice pace and we wanted to make sure we were not caught behind.'

The new DC currently serves 75 stores and additionally crossdocks products to two regional DCs.

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Besides being much larger, the new facility has also increased storage and processing capabilities. It sports 42,000 pallet storage locations, whereas the former Northbrook, Ill DC had only 12,000. The new DC also has 110 receiving docks compared to 26 in Northbrook.

Last July, a 340,000 square-foot addition was erected to handle the \$100-million direct fulfillment business. Included is a two-level, 51,000 square-foot mezzanine where order processing takes place. A 120-seat call center was also added to the building to receive catalog orders and handle customer service, which are part of the direct marketing operation. A retail store also adjoins the facility and carries outlet and discontinued furniture.

Combining retail and direct fulfillment in one facility has proven to be a good marriage, with over 36-million individual pieces shipped annually from the DC. The facility averages about 35,000 outbound cartons daily with holiday peaks of 70,000.

'Both projects have met our expectations,' says Michael Kalck, general manager. 'Our goal was to make sure start-up was transparent to our customers. We actually improved customer service during the process.'

Homeward bound

Two separate processes occur simultaneously at Crate&Barrel. While products are gathered for delivery to stores, the direct fulfillment area swings into action to handle direct-to-customer distribution.

Fifty percent of the products that arrive at the DC are from overseas, most of them originating in Europe and the Far East. All importers send advance ship notices before their products hit the facility's 110 docks. A cubing system records the dimensions of new stock keeping units (SKUs) upon arrival. This information is used by the warehouse management system (WMS) as it determines how to process the receipts.

An arriving SKU is keyed into the WMS at a processing station that triggers the creation of a bar code license plate. This is attached to the pallet to aid in tracking the load throughout the facility. All interior cartons of each product are also required to have supplier-provided bar codes for tracking during order processing.

About one-third of the imported products received are immediately cross-docked to two regional DCs located in New Jersey and Northern California. The WMS then determines where to send the remaining product - to bulk storage in pallet racks, floor level storage, or to a pick module.

Floor level items include those that have a short life span in the facility as well as items too large to place within the pallet racks. Lift trucks take pallets of these products to the assigned storage locations.

Most merchandise is stored in the 24,000 locations of the main bulk storage area. Additionally, some of the hotter items are placed in a 6,500 pallet-position overflow rack area situated close to the retail pick module. SKUs likely to be used in direct fulfillment may also be deposited into racks with 12,000 locations near that processing area.

Reach trucks handle putaway. Depending on the length of the run, a lift truck may initially carry the load from the dock to a position closer to the selected storage rack so as to reduce the travel distance of the reach truck. The WMS assigns storage locations and provides this information to the reach truck driver via a radio frequency data communication terminal. Upon arrival at the proper location, the pallet is deposited, and the pallet license plate and the rack's bar code are scanned to confirm proper putaway.

Another 10% of receipts bypass storage altogether and are taken by lift truck directly to the retail pick module. These are SKUs that the WMS determines are needed immediately for replenishment.

'The product in the pick module turns over quickly,' says Kalck, 'as we keep those locations full of our highest velocity SKUs.'

Replenishment and fulfillment

Each retail store electronically sends the DC orders for the products it needs. Kalck and his team use this information as the basis for replenishing the pick areas for the next day's fulfillment. The replenishment process is also designed to match the various delivery cutoffs for the stores. For example, Chicago area stores receive four deliveries weekly, while distant

locations in California and Texas are sent one truckload each week. Cases are then pulled from the pallet and floor storage and delivered by lift truck to the pick modules.

Items are also taken three or four times daily from the bulk storage area to replenish the direct fulfillment processing areas.

'The direct fulfillment operation is treated like a big store,' says DeGross. 'The retail part of the DC makes deliveries to them throughout the day.'

Meanwhile, order processing begins in the retail fulfillment area. This entails case picking, split-case picking (piece processing), and pick-and-pack operations.

A pick-to-label procedure is used for case picks. To begin, a pick label is printed that contains the SKU number to be selected, its location, a shipping label, and content pricing information that is used once cartons reach the stores.

An electric pallet truck operator pulls the case specified on the pick label, attaches the shipping label to the outside of the carton, then places it upon a pallet. Each pallet represents a store. Once the pallet is full or all picks for that store are completed, the operator takes it to one of the staging lanes located near the outbound shipping docks. Some orders will ship on pallets while others will be sent without pallets depending on store preferences.

Lift trucks also pull items from the floor level storage area and marry them in the staging lanes with items brought from the pallet racks.

About 40% of the retail order filling is performed within the three, 3-tiered pick modules. Pallet flow racks are used for most of the split-case processing. They occupy two complete modules and half of the third, segmented into a total of five zones. One-and-a-half levels of the third module comprise the pick-and-pack area, which features flow racks and shelving.

A pick-and-pass strategy utilizing pick tickets directs fulfillment of split case orders. Most items are selected into a standard-size 19 x 16 x 13-inch carton, with the exception of orders for Chicago area stores which are picked into returnable plastic totes.

As picking begins, the label is hand scanned in the first zone holding a required item. That first item is then pulled, scanned, and placed into the carton or tote. The container is passed along to other zones for additional selections.

Picking continues until the carton is full, or filled sufficiently to protect items on the bottom. The last item placed into the carton is also then scanned. DeGross says that at one time workers had scanned every item as it was deposited, but found that scanning only first and last items proved to be just as accurate and much less time consuming, especially as workers became more familiar with the process.

The completed carton is then sealed, labeled, and placed onto an outbound belt that conveys it to a sorter located above the shipping dock.

Items that are not already packaged or require the additional protection that individual wrapping provides are selected from the pick-and-pack area. Orders here are processed slightly differently than orders that flow through the pick-and-pass zones. Instead of passing from zone to zone and worker to worker, one person walks with a store's order through the three zones of the pick-and-pack processing area.

The worker hand-selects items, wraps them, and places them into cartons. This person may use as many as ten cartons at a time and perform 1,000 picks from 700 different SKUs to complete that store's order.

Once all items are selected, the cartons are sealed and labeled while still within the module, then pushed away onto a take-away conveyor that carries them to the shipping sorter.

Direct-to-customer

Order processing in the direct fulfillment area begins with the customer, who either phones the call center, orders online, or signs up in a store for the gift and bridal registries.

The WMS looks at the demand created by all orders and directs required bulk replenishment to the direct fulfillment pick faces. Most replenishment comes from the main retail storage

area while other items are brought from the pallet racks adjacent to the processing mezzanine.

About 11,400 direct fulfillment orders are processed daily with a seasonal peak of 20,000. Most ship within 24 hours. A high-volume line handles those hot single items that make up an order, as well as back-ordered products. These are pulled in batches and bypass the pick-and-pack lines heading instead to a separate packing area.

Other selection takes place on the lower level of the mezzanine based on instructions from a customer information sheet that accompanies the order. Items are picked into totes, with one order assigned to each tote. Again, pick-and-pass is used as the totes wind their way through six zones. The average catalog order contains 2.2 lines, while gift registry and Internet orders average 3.2 lines. Verifiers check orders during the process to make sure accuracy is maintained.

Once all picks have been completed, the tote is elevated by conveyor to an upper-level packing operation. Here, items are removed from the totes, verified against the list, and packed. Workers choose from 20 different carton sizes. Some items are bubble-wrapped, while foam peanuts are added to other orders to fill void areas.

The carton is then sealed, a label is attached, and it is pushed off onto a conveyor that winds its way around the perimeter of the building. It eventually joins other cartons coming from the split-case processing and the pick-and-pack areas in a five-way saw-tooth merge. This feeds a sliding shoe sorter with 14 diverters. Direct fulfillment cartons filter to two lanes that accumulate for UPS and the US Postal Service delivery.

Most retail cartons are diverted down 12 lanes that feature extenders for smooth delivery of cartons directly into outbound trucks. Here they join full case products that were staged in lanes adjacent the 36 outbound docks. Typically, a full trailer will contain orders for two stores.

A fleet of six company-owned trucks handles local deliveries. Orders for West Coast and Texas stores may also be taken to rail lines for shipment.

Orders are not only processed in a timely manner, but they are completed with 99.5% accuracy. The facility has also posted nearly unheard of return numbers in the Internet/catalog world due to solid customer service and quality control.

'We have had a significant reduction in returns on our direct fulfillment,' says Kalck. 'We had less than 2% of returns in December, which is superb.'

Good packaging and handling processes additionally reduced product damage by 50% in just one year.

The building has also achieved the company's goals of consolidating functions under one roof, improving throughput, and increasing capacity.

'It takes a lot less time to process here,' says DeGross. 'We had to struggle to get our peak in the old building.'

Next month a new 220,000 square-foot DC designed for distribution of its furniture lines will open directly behind the retail/direct fulfillment building. The facility will feed 20 stores.

'These start-ups have taken place during significant growth periods,' says Kalck. 'The retail locations are very pleased with the service we have provided.'

DeGross adds that his staff has had a huge impact on the success of the start-ups.

'They have had a major commitment to this building,' he says. 'There is a lot of pride here.'

Sidebar

System Snapshot Crate&Barrel, Naperville, Ill.

Opened: 1998

Direct fulfillment added: July, 2000

Stores served: 75

Daily throughput: 35,000; 70,000 peak

Employees: 275

Conveyors, Merges, Sliding shoe sorter:

Automotion, 708-229-3700, www.automotionconveyors.com

System design and integration:

Sedlak Management Consultants, 216-587-2100, www.jasedlak.com

Lift and Reach Trucks:

Crown Equipment Corp. 419-629-2311, www.crownlift.com

Mezzanine:

Wildeck, Inc., 414-549-4000, www.wildeck.com

Pallet Racks:

United Steel Products, 570-476-1010, www.usprack.com

Flow Racks:

King-Way Material Handling, 800-554-6632, www.king-way.com

Hand Scanners:

Intermec Technologies Corp., 425-348-2600, www.intermec.com

Fixed Scanners:

Accu-Sort Systems, 800-227-2633, www.accusort.com

Cubing System:

Quantronix, Inc., 801-451-7000, www.cubiscan.com

Packing Tables:

Dehnco Equipment Co., 708-382-1579, www.dehnco.com

Foam Dunnage:

FP International, 650-364-1145, www.fpintl.com

Bubble Air Wrapping:

Sealed Air Corp., 201-712-7000, www.sealedair.com

Totes:

Orbis, 866-290-3342, www.orbispallets.com

Stretch Wrap:

ITW Mima, 954-724-7788, www.itwmima.com

Accu-Sort Systems, 800-227-2633, www.accusort.com

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