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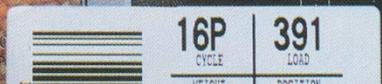
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Bar Codes Effect Liquor Distribution Efficiency

Jaydor's distribution center in New Jersey battled high overtime expenses associated with a manual order picking with a bar code case sortation system that eliminates excess labor costs by over \$1 million a year. Savings also accrue from processing and cross-docking orders for a second facility.

Based in Milburn, N.J., Jaydor Corp. is a state-wide distributor of alcoholic beverages and specialty foods that stands out in an otherwise conservative, heavily regulated industry that's rife with union labor. Pushing aggressively for expansion by augmenting the traditional alcoholic beverage fare with new lines of gourmet foods and beverages, the \$100-million-plus privately held company has succeeded in expanding its business but not without racking up huge overtime and temp-labor expenses to get product out the door. Pinching profitability, its outmoded manual picking system was due for an overhaul.

"We were looking for higher productivity, to put more out with the staff we had," says Ron Garnett, senior vice president/director of operations. The answer turned out to be a highly automated bar-code case sortation system designed and integrated by W&H Systems. The system streamlines the picking, sorting and loading process, and permits Jaydor to remain in its 165,000-sq-ft Milburn facility.

Jaydor's previous case picking system, which consisted of picking and loading orders one at a time, permitted a maximum throughput of about 6,000 pieces without going into overtime. But with steady growth, the company has been averaging 8,800 cases a night.

The company accepts orders during the day, loads trucks at night and starts delivery early the next morning. While the night crew does picking and loading, the day crew receives incoming truckloads from manufacturers and replenishes inventory on the floor.

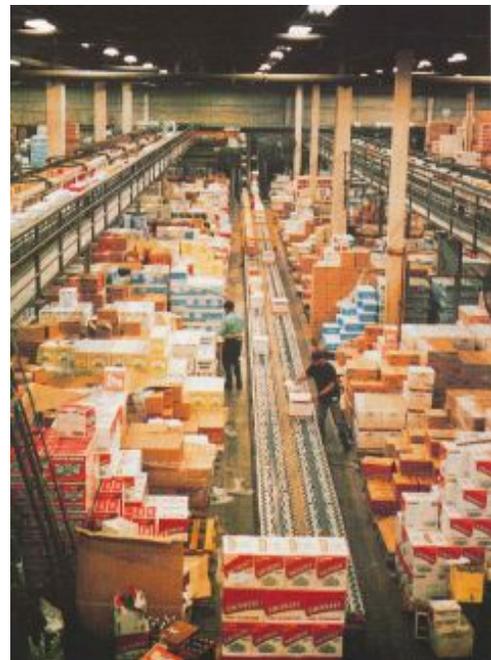
In addition to causing substantial overtime, the high volume led to late deliveries and even backed up into the daytime replenishment operation, forcing the day crew to help the night shift finish loading.

Running since August '94, the new bar code-based sortation system expands throughput capacity to about 9,500 cases a night without overtime and requires three fewer people. Additional capacity can be achieved by adding a second loader for each of the four loading doors to handle peak demand, such as during a holiday season.

In addition to accommodating the company's anticipated growth, the new system was designed to consolidate into Milburn all of the lower-volume stock-keeping units from the company's other

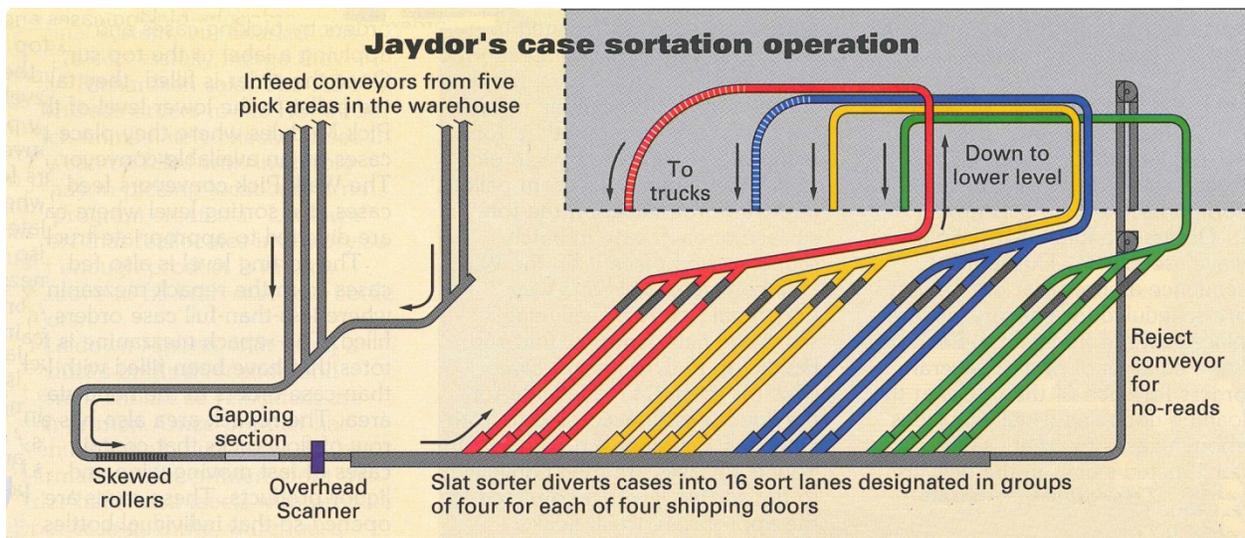


On the mezzanine level of Jaydor's distribution center, cases of liquor accumulate, above, after having been sorted into the appropriate one of sixteen separate sort lanes based on the bar code label affixed to the top of each case. Accumulated lanes of cases are released in sequence to the designated one of four active shipping doors on the main level. Below, workers carry a batch of freshly printed bar code labels and pick cases, hand-apply labels and place cases onto a takeaway conveyor that leads to sortation



distribution center, a 100,00-sq-ft facility in Pleasantville, N.J., which serves the southern New Jersey market. The modernized Milburn facility can now process the orders for the inventory-intensive, lower-volume portion of Pleasantville's orders. Loaded in delivery-stop order, orders are trucked down to Pleasantville, where they will be cross-docked and manually merged with Pleasantville orders-consisting of the top 45 SKUs, a lean inventory-on local deliver trucks. By using the Milburn facility as a distribution center and the Pleasantville operation as a so-called hyper-terminal, Jaydor saves the expense of having to prepare orders and stock inventory for about half the Pleasantville D.C. volume.

The bottom-line savings? "With the elimination of overtime labor and the anticipated change to a hyper-terminal situation," says Garnett, "it will bring about an operation savings of well above a million dollars per year." Jaydor expects a two-year payback on the system.



Bar code smart sort

Unlike the old system where each order was picked and loaded individually, the new system is structured so that cases are picked in batches or waves of orders. Garnett explains: "Instead of walking up and down that line to pick these items by individual invoice, we consolidate those invoices into a batch of 500, and we pick everything we need from each location for that 500 at one time."

Before the pick process starts, Jaydor accumulates orders until 5p.m. for next-day delivery to both restaurant and retail liquor store accounts throughout New Jersey. The orders are then run through computer software supplied by Roadnet, a subsidiary of United Parcel Services. The Roadnet model generates a suggested delivery route for each truck, taking into account a variety of factors including the number of cases, number of stops, geographic locations, traffic patterns and each account's acceptable receiving times. Distribution management personnel then make any necessary adjustments to the suggested routing.

After the routing is finalized, it is downloaded from the host to the warehouse management system, running on a series of networked PCs, along with order and inventory information. An Intermec thermal-transfer printer generates a batch of 3X4-inch bar-code labels for the product to be picked in the order that the material is stored on the warehouse floor. A separate batch is printed for each of five pick areas in the warehouse. (Currently, one printer generates labels for all five of the main pick areas, although plans call for five separate printers.) The labels consist of a bar code with a unique case ID, wave number, sort lane, truck load, shipping door, delivery stop number and piece number for that delivery. The label also contains information on that case's storage location in the warehouse, including pick area, aisle, location and SKU. They are also printed with the time and date. As a

security measure, the customer name appears nowhere on the label so that pickers and loaders have no idea where the product is going.



Cased product at Jaydor is not actually labeled until it is picked. To do so, pickers walk from one inventory position to the next, referring to their labels to note the required number of each item to be picked. They do not pick what they don't have a label for, and they don't have to worry about the loading order, since the warehouse management system will sort the cases automatically. As they grab a case, they hand-apply the label to the top of the case and place it on a conveyor which leads to a mezzanine area to merge with cases from four other pick areas.

At Jaydor, approximately 6,600 SKUs are divided up into five main pick areas, segregated according to volume. The fastest-moving items, consisting of about 210 SKUs and representing 64% of Jaydor's business, are split across four "bull" areas. One of those bull areas is also combined with what's called an oddball area; this is where the remaining slower-moving items are stored. A fifth area, known as the "split" area, holds about 1,200 SKUs of open cases of liquor in a flow-rack arrangement, representing items that are ordered only a few bottles at a time. A picker pulls individual bottles from the open cases based on a pick list generated by the computer; those bottles are then packed in a case which is shrink-wrapped with the pick list inside. Like other cases, the bar code label is applied to the outside, although the SKU field is blank since the box may contain several. Shrink wrapping is currently done by hand, although this function was scheduled to be automated at press time.

After a wave is picked, cases accumulate on five spate conveyors (one for each pick area) in 50-ft lengths. Cases are then merged into a single stream in a simple round robin fashion. The resulting single stream of cases-totally random-must then be sorted. That's where the bar code label comes in. After cases are appropriately spaced apart from one another by a skewed roller positioner and servo-driven conveyors from Roach Mfg. and Buschman, they are scanned by an overhead omni-directional scanner from Accu-Sort. For each case that's scanned, the warehouse management system is queried to determine the proper sort lane and shipping door for that case. That information is transmitted to a Unisort V slat sorter from Bushman, which uses sliding slats or shoes to gently divert each case into one of 16 different sort lanes, four for each door. Within the four lanes for a given door, cases representing the last group of deliveries and hence the first to be loaded, are diverted to the first lane, which is immediately dispatched to the loading door. The subsequent three lanes are released one at a time so that the cases can be packed in the correct order. Each lane contains from 30 to 35 cases and represents the finest resolution of sortation; that is to say, cases are not necessarily in order within a given sort lane. However, loaders can juggle the order as needed simply by looking at the stop number (and piece number for each stop) printed on the bar code label.



Loaders stack cases directly on the truck floor in stair-step fashion so that the driver can read the labels on the tops of the cases during delivery. Although there are actually six shipping doors, only four are loaded at a time. Two existing stationary extendabl-belt conveyors extend into trailers at two separate doors, and two motorized, flexible belt conveyors from Best Diversified Products can be quickly switched among the four remaining doors. Kegs and other nonconeyable items are manually brought to the loading area, scanned in at the shipping door with hand scanners from Symbol Technologies and loaded onto the trucks. Since Jaydor owns the trucks, freight is not an issue, and product is never weighed.

Once the four sort lanes for each shipping door have been loaded, trucks are ready for the next wave of cases. As a rough average, there are three waves to a truck. A normal wave might consist of 500 pieces which translates into 125 cases per truck, or about 30 cases per lane. A single wave takes about 18 minutes to process through the system. Each shipping door handles multiple trucks during each night, and all trucks are loaded with cases and waiting for their drivers by 5:30a.m.

Requires smarter management

Just because the system is faster and more efficient doesn't mean it's easier to manage. In fact, Garnett argues that it requires sharper management acuity to make sure the system is balanced at all times. By working on the mezzanine level with the sorter, the warehouse manager can keep a bird's-eye view on the entire operation, monitoring activity in the picking, merging, sorting and loading areas, and make necessary adjustments. Garnett gives an example: "The manager can see what's coming up three waves from now and staff accordingly—for example, by moving one worker each from the oddball and bull areas into splits. Otherwise, if you have cases backed up on four lines and the fifth is empty and waiting, the whole wave is delayed until that fifth line is ready. If you don't balance it properly, you won't get efficiency out of it."



Although the older system didn't require the vigilance required to shuffle labor around as needed, neither did it score high marks for worker productivity. Pickers worked on a calling system, where they would wait for an order to be called out for their particular zone so they could go pick it. If a zone went for a cycle or two without an order called out, that picker would be idled.

In contrast, the new system permits workers to be moved around as needed. In fact, Jaydor takes it a step further by shifting all manpower in the beginning of the night into pre-staging a backlog of 10 or so waves before the system is even turned on. Once the system begins processing those 10 waves, loaders return to the shipping doors and pickers stage subsequent waves for immediate loading, keeping the system at full capacity for the remainder of the night. Operating this way, the system can sort cases at speeds approaching 1,700 cases an hour. Although the system was designed more with live picking in mind, Garnett says this pre-staging approach heightens efficiency. "If you didn't have the prep time, your waves would be 21 minutes because you're always waiting for product. The system won't be balanced." There's also the flexibility to add labor to further increase output; by using two loaders per door during high-volume periods, a 500-case wave can be handled in 15 minutes, resulting in a sorting speed of 2,00 cases/hour.

A key benefit of the system is order integrity, with the bar-code labeling serving as the key to complete order tracking. Management can review printed reports that show exceptions (cases whose labels were printed but were never scanned by the Accu-Sort overhead scanner or at the door) and no-reads (cases that are detected by the scanner whose labels can't be read because they're miss-applied). Accuracy is so high that exceptions and no-reads combined account for less than half a percent, according to Garnett. The manual checker required under the old system was freed up for other duties.

If a case isn't delivered or was returned for some reason, it is immediately scanned back into the warehouse management system which generates returns reports for each truck and for an entire day. The tight inventory management also keeps shrinkage in check. "Since every label is accounted for, we have very good controls on where the merchandise is going," says Garnett.

Switching to the bar coded-based case sortation system has permitted Jaydor to get the productivity it needed, slash unreasonable overtime and eliminate delivery delays, all without alienating union labor. For Garnett, it comes down to a question of adding value: customers get improved order integrity and on-time delivery while permitting Jaydor to relieve pressured profit margins in a crowded, price-sensitive market.

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