New labeling, loading method is a smash hit at Blockbuster

With capacity limitations and tight movie-title deadlines, Blockbuster Video redesigns four packaging lines and adds a fifth to its distribution center in McKinney, TX, to cut reject rates and improve the data flow and processing of rental products for timely delivery.

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While standing in line to rent a new release at a Blockbuster store, it may be difficult to imagine the complex supply chain that ultimately put that movie into your hands. Every day, thousands of movie and game titles are packaged and labeled for delivery at Blockbuster, Inc.’s distribution center in McKinney, TX. Ensuring order fulfillment accuracy just-in-time is integral to the company’s success. Its 850,000-sq-ft facility there processes orders 24 hours a day, six days a week, for the more than 4,400 Blockbuster stores across the country.

With more than 8,500 corporate and franchise stores in 23 countries, including 3,200 stores outside of the U.S., Blockbuster, based in Dallas, is recognized as a leading source of rentable home entertainment. Operating under a “boxed” manufacturing cycle, meaning that it’s confined by capacity limitations and street dates (when the title needs to arrive at rental stores), Blockbuster wanted to jumpstart order processing and packaging efficiencies while working within its limited manufacturing cycle. A new format would require a progressive change in existing printing and packaging processes.

After evaluating its options, the company decided to retrofit its four packaging lines and add a fifth line to meet increasing demands on its store supply chain. It also modified its packaging with revisions to its rental policies and replaced Blockbuster-branded inserts with rental labels on the front panel of every new-release title.

The project involved modifying some of its existing packaging equipment and incorporating new technology to save both time and money. Operational efficiencies have improved by more than 40 percent while downtime has dropped to less than 5 percent. Along with installing the new equipment, the project required an overhaul of data integration and system interfaces, as well as upgrades to hardware and software and implementation and testing. Part of the project involved partnering with outside suppliers. Having worked with two companies on a previous automation project, vp of distribution and logistics Bill Wissing says the Blockbuster team looked again to Videojet Technologies, Inc. (www.videojet.com) and DVD video-disc packaging equipment manufacturer GIMA (www.gima.com) of Bologna, Italy, for assistance on this assignment.

With it, Blockbuster has reinvented its entire rental packaging process, upgraded four existing packaging lines and added a fifth line with automation now managed by Videojet’s Data Management System (DMS). The DMS is a customized suite of seven, separate software applications developed specifically for Blockbuster by Videojet’s Integrated Solutions Group. It provides a data control and reporting system that handles a
flow of information in real time between Blockbuster’s warehouse-management system (WMS) and movie-rental product-handling machines from GIMA on the five lines. The interface links the host WMS information into the packaging equipment and manages the data for each production run, feeding the information back to the host WMS. Altogether, five GIMA DVD872 disc-packaging machines, five GIMA 8A6 labeling machines, five GIMA 8A5 vertical hoppers and five GIMA 8A7 tote packer/collators were installed.

Also on each line are two new Videojet Labeljet 262 print-and-apply labelers, integrated into the 8A7 packers, and three Model 210 pressure-sensitive labelers. “This allows us the flexibility to apply marketing labels to the front panels of the rental products in a wide range of marketable space,” explains Wissing. “It also allows for automatic redundancy on the label-application machines in support of quick changes on like materials.”

The first retrofit took place on the front end of the lines with the replacement of former label printers with the 8A7 and Videojet printer/applicators,” he says. “The second retrofit was on the back end, with the elimination of a semi-automatic bundling operation and the adoption of the sortation/collation and packaging machines.”

The DMS software and hardware combination is teamed with the new print/apply labelers equipped with SATO (www.satoamerica.com) thermal-label printers. The DMS provides the information the packaging machines need in order to activate the appropriate components for production runs, collect data for inventory processing by the WMS and report data in real time to operators and maintenance personnel who may view it on the production floor. The video-rental packaging equipment, in return, provides feedback to the DMS on machine downtime and raw-material usage counts.

Says Dennis Caron, manager of technical solutions and LCM support at Videojet, “This is also a one-hundred-percent-order-fulfillment system that ensures that all orders ship complete.” Adds Wissing, “Order fulfillment has improved to 99.99 percent, with total reject rates down to 0.001 percent.”

The production process begins with the order-management system providing a “wave,” or production run, for a single movie title to the DMS. According to Blockbuster, waves can range from a single copy for a single store to more than 1 million copies divided between each of the 4,400 Blockbuster stores.

A wave file is created, which contains all of the data necessary for a run, including information as to what promotional inserts are to be included in the DVD cases, street address information for the Blockbuster store outlets receiving copies of the title and precisely which copies are to be sent to each store. The wave is also subdivided into smaller units called tasks that are typically single-store orders for an individual movie title. The DC’s conveying equipment affords task sizes of a maximum of 30 pieces, which is the amount of cases that fit into one tote. As such, for stores ordering more than 30 copies of a single title, their orders are spread across multiple tasks.

The wave file is processed and filtered into several unique files to be used by the DMS. The System Manager™ central-control software for the DMS is responsible for processing the wave file and creating the files necessary to run the production wave on the equipment.

There are now five identical production lines on the plant floor, each managed by a separate Line Manager application interface that provides real-time data, line-to-line, and to and from the GIMA equipment. There are also Microscan (www.microscan.com) Model MS9 and Model 860 bar-code scanners positioned throughout the production lines.

The lines each start with the GIMA DVD 872 system, which loads the products such as movie DVDs into plastic cases from Technimark (www.technimark.com) and inserts paper movie-title sleeves into the outer jacket of each case. The Line Manager manages data between the DMS, the packaging equipment, the scanners and the labelers. It also provides production data back to System Manager as well as a constant stream of data to three other DMS applications running at each line.

These three applications are Rework Manager™, Shift Manager™ and Status™. Rework Manager is responsible for allowing operators to manually complete any tasks that were not 100-percent-fulfilled by the DVD package-assembly equipment. Thus, partially completed tasks occur when the rental products are rejected during a production run.

The Shift Manager and Status applications provide data collection and production data on a 52-in. plasma display mounted to a wall at the end of each of the lines. All of the computers running the DMS applications are located in a climate-controlled office.

The production run, or wave, can be initiated by a line-lead operator from the Line Manager via the industrial computer, prompting signals to be sent about wave information to the various components, the DMS software and the rental-product packaging machines. The Shift Manager is an informational data display that extrapolates, calculates and communicates real-time production data to Blockbuster’s operations and management teams.

After the rental-product cases pass through the 872 assembly machine and receive inserts, such as coupons, instruction booklets and the discs themselves, the cases are mechanically closed. Next, they convey to the Videojet 210 p-s label applicators, which apply preprinted, new-release rental labels or license tags to the front panel of each new-release unit as well as pricing information to the bottom right front corner of the cases. A Videojet-supplied label verification system [model 5410 camera-based vision systems from Cognex Corp. (www.cognex.com)] validates the presence of the label and ensures that every case has a label positioned within stringent placement requirements. The verification system finds cases without labels or those with noncompliant labels, which will cause the line to stop, allowing line operators to correct any issues with the labelers.

After the rental-product cases pass through the GIMA DVD8A5 machines complete store orders by collating individual, cased DVDs, bundling them with backer cards, validating the printed rental labels and packing the DVD cases into outbound totes with random-order profiles. The tote packers are also responsible for tracking the copies into certain totes. Only one task’s DVDs can be placed into each tote.

Near the end of the packaging line, another Videojet 262 print-and-apply labeler generates a label with a unique bar code that it applies to the side of the plastic tote in which the DVD cases will be loaded. The packer also places task copies into the tote, and the DMS system synchronizes the unique tote ID barcode with the task copies in each tote.
The Microscan Model 860 scanners also scan bar codes printed on the totes. A task report containing the specific information for up to 30 copies per tote is automatically sent to another portion of the DMS application to the Blockbuster WMS via a high-speed network connection using Process Manager for Data™ from Metastorm (www.metastorm.com).

Warehouse personnel can use this part of the DMS application when errors occur in the handling of the totes after they leave the control of the DMS. Workers can locate a tote and its contents within the database by scanning either the tote’s bar code or one of the copy bar codes. Tote or copy labels can also be reprinted if they go missing for any reason or somehow become damaged in the conveying process. The Process Manager for Data connection ensures the data for each tote is entered into inventory before the totes arrive at an automated sortation area. Used to track store inventory and customer rentals, the copy information is also vital to the process. “We track tens of millions of unique part numbers through this system,” says Wissing.

A set of unique process requirements also comes into play. Blockbuster’s new system requires 100-percent fulfillment of each and every task to eliminate having to reconcile partial tasks after an initial wave is completed. To accommodate this need, a rework station was added on the production line. Should even a single copy of a task be rejected prior to placement into the tote, the entire tote can be sent to the rework station.

There, the Rework Manager system allows an operator to manually rectify a shortage, reprint any missing copy or missing or misprinted tote labels or unreadable bar codes and close the data loop for the tote. Once the rework is complete, the tote is placed onto a takeaway conveyor for outbound packing to the consolidation department, which incorporates a pick-to-light system. Real-time reporting is used throughout the DMS.

The setup also includes an online display that, courtesy of the Status application, presents real-time, visual feedback to operators or anyone in the production area. Working with the Line Manager and the DVD872 rental-product inserters, a computer running Status is attached to a 50-in. plasma display mounted at the end of each production line. Whenever the status of a production line changes, the tote-loading unit sends an error code to the DMS, which immediately updates the plasma display with the reason for the status change and provides a clock to show the amount of time spent in the current state.

There are three line-status indicators for each line: red signals that the line is down; yellow means the line is waiting for operator input; and green indicates that the line is running. Timers also display up-to-the-second totals for each state of a current shift. All of this data is logged into a database for machine-status information. This allows Blockbuster to determine the reasons for downtime and implement processes to reduce it and increase efficiencies.

Installation of the equipment began in April 2005 and was completed in September 2005. The results have produced an integrated packaging line that delivers “perfect” order fulfillment and process efficiencies, a reduction in product damage and a reduction in rejection rates from 0.5 percent to less than 0.01 percent. “It was a collaborative partnership between us, GIMA and Videojet,” sums up Wissing. “We’re pleased. We got a system that’s economical, efficient and managed in a timely manner.”

More information is available: