



Convenience Chain Takes Charge of its Supply Chain

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O utsourcing “non-core” functions is a trend for many organizations, so it is remarkable to witness a company bucking the tide and successfully taking on management of its own distribution and logistics operations.

The company, Sheetz, Inc. of Altoona, Pa., is a national leader in the convenience store industry. Founded in 1952, Sheetz now operates around 300 stores in Pennsylvania, Maryland, Virginia, West Virginia, Ohio and North Carolina. In addition to offering numerous shelf-display items and cooler and freezer stock, the stores provide three grades of gasoline as well as lottery tickets, fresh-brewed coffee and made-to-order subs, salads and sandwiches. As a hybrid business offering a large array of products and services at each location, Sheetz needed an integrated supply chain that would capture both retail and wholesale dollars and manage them to improve the company’s margins.

Total Control

Sheetz was using two third-party logistics (3PL) firms to coordinate the distribution of products to its stores. Realizing that its activity level would greatly increase in the coming years, Sheetz management wanted to know whether the 3PL system would be the most efficient approach or if it should consider building its own distribution system. Sheetz employed Tompkins Associates to help answer the question.

Tompkins conducted a Logistics

Strategic Master Plan (LSMP), which included defining the best practices for the situation, checking the economic justification and devising an implementation strategy.

Tompkins found that Sheetz could distribute products to its stores more economically and with improved service levels if it managed its own distribution process. The company would see a positive return on investment and, by controlling its own distribution operations, would present a consistently high-quality image to its customers.


The LSMP gave Sheetz the direction and confidence necessary to develop a long-term distribution strategy, and it ensured that investments were well-placed and risks minimized.

Sheetz’s self-distribution strategy would provide more flexible service scheduling and delivery frequency, customized down to specific locations if needed. It would also improve quality assurance and temperature control for the high number of perishable food products among Sheetz’s offerings.

Real Solutions

In planning for Sheetz’s new approach, the key to a seamless supply chain operation would be a modern distribution center (DC) designed to meet both immediate needs and those extending to 2007 and beyond. Tompkins developed the detailed plans for the new DC, addressing

Sheetz shifts from 3PLs to its own distribution



construction, transportation, systems, material handling and organizational and operational issues.

The design phase included building a simulation model of the proposed DC's picking and shipping processes. The model, created by Tompkins and Automation Associates Inc., was used to validate system throughput capacities, determine locations of potential bottlenecks and ways to eliminate them, determine sensitivity levels of production rates and staging capacities, and understand the opening-day staffing and schedule requirements.

The solution was a new, 365,000-square-foot DC focused on handling goods in ambient, cooler and freezer areas, much like the locations within a typical convenience store. Seventy percent of all Sheetz product runs now through the DC.

Throughout the facility, Tompkins installed and integrated material handling equipment in a cohesive package that merges Sheetz's distribution operations and interfaces with all the selected systems.

Unit picking for totes is utilized for less-than-case items from flow rack/shelving and carousels in the ambient area and full-pallet locations in the cooler/freezer area. The Warehouse Management System (WMS) pre-cubes totes prior to picking and provides the labels required for picking and for tracking each tote through shipping.

Of Sheetz's approximately 3,000 SKUs, 700 of them—mainly health care and beauty products and general merchandise—are stored in nine carousels laid out in three pods of three carousels each. The carousels provide for batch picking up to five totes—which typically means five stores—per pod at one time.



A 365,000-square-foot distribution center and a truck fleet drive the Sheetz-run distribution network.

Picking from carton flow rack and shelving in the ambient zones is performed discretely, one tote at a time, with RF equipment. The operator completes an entire store order in a path designed to return the operator to the starting point to initiate the next order.

After unit picking from the carousels and the rack and shelving is done, a conveyor sortation system takes the totes to a flow rack put system for staging according to store order.

Unit picking in the cooler and freezer areas allows for batch picking up to eight totes at a time across multiple orders. RF wristband equipment is utilized in the cooler, while the freezer requires handheld RF guns.

New Life for Orders

Because cigarettes are an important staple in the convenience store industry, a special put system within the ambient area is designated for cigarette carton picking. This system uses zone methodology and batched orders. Cartons are batch-picked by brand and destination state, given the appropriate state tax stamps and then grouped by route and store. The conveyor system takes the totes to the flow rack put system.

Totes are pulled from the put system using RF equipment and moved to pallet pairs that are pre-cubed to accommodate totes and cases for a specific store or for a group of stores on a specific route. Once tote-picking is complete, a double-pallet jack takes the pallet pairs through the full-case picking process to be finished.

Reserve for most products is stored in

the upper levels of single-deep pallet rack, double-deep pallet rack and four-deep push-back rack. Full-case picking is done from the first level of rack, which includes single-pallet locations, two-deep, four-deep pallet-flow, decked shelving and carton flow. Within the ambient, cooler and freezer areas, full-case picking utilizes labels, and picks are confirmed with the RF equipment.

The process ends with stretch-wrapping and loading from the ambient docks. All freezer pallets are loaded into the noses of trailers, followed by cooler and ambient pallets.

Because managing its own distribution process was a new experience for Sheetz, the company required new application software systems. Together, Tompkins and Sheetz selected and implemented Retek's WMS, BGI International's inbound freight software, Roadnet's outbound routing software for Sheetz's private delivery fleet,

The installed systems are progressively manageable and cost-efficient as employees increase their work experience.

Advanced Food Systems' (AFS) order-entry management/purchasing/demand-forecasting/financial transaction software, and Mobilecast's onboard truck computer system.

The order life cycle begins with Leveled Vendor Managed Inventory (LVMI), an EDI system Sheetz developed in-house. LVMI uses sales history to create unique weekly product orders for each store, leveled into three deliveries per week. Orders then move through the AFS software, which handles the soft inventory allocation.

Orders are then passed through the Roadnet software, which schedules routing to meet delivery windows and minimize costs. From there, the orders pass to the WMS, which allocates inventory, creates pick directives and assigns specific shipping doors to routes based on the departure times of each truck. The WMS pre-cubes items in totes and on the pallets and breaks down the work for each of the three temperature areas and the full-case areas.

After passing this information to the carousel, conveyor system and cigarette system, product is picked, the WMS con-

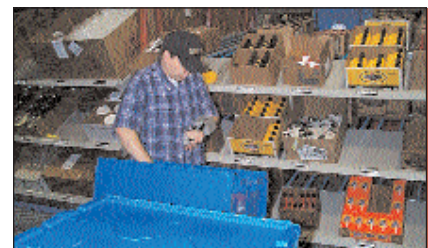
firms picking and the trailers are loaded and closed. Then, the WMS sends manifest information back to the AFS software, where invoices are generated and downloaded to the Mobilecast software.

It is a robust operation, but a comprehensive plan created by Tompkins' training arm, Tompkins University provided training on all aspects of the implemented systems. Job aides—pocket-sized reference manuals—were created for each employee to cover ambient picking, bulk and container replenishment, cooler picking, loading, pick to pallet, putaway, receiving and store returns. The coordinated instruction helped Sheetz personnel quickly master the operation and maintenance of their new DC.

Real Results

The Tompkins/Sheetz team successfully designed and implemented a state-of-the-art, multi-temperature DC with leading-edge technology that provides a competitive advantage through cost savings for Sheetz. The company's supply chain is more responsive to retail opportunities because it manages its own distribution operation.

The new DC minimizes congestion between replenishment, putaway and picking while keeping a logical product flow throughout the facility to ensure products arrive at the loading dock together. The installed systems are progressively manageable and cost-efficient as employees increase their work experience. Most important, the new self-distribution strategy has opened up new pipelines of communication due to Sheetz's increased leverage



Unit picking is done from case-flow rack into totes in the ambient-temperature area of the Sheetz distribution center.

with vendors and manufacturers and a common database for product movement that provides the ability to make intelligent buying decisions.

By implementing Tompkins' recommendations on time and within budget, Sheetz is in direct control of its distribution and supply chain operations and has the flexibility to meet peak and seasonal customer demands.