



Apparel Manufacturer Evaluates Systems Throughput, Scheduling Operations, and More

A major apparel manufacturer based in Memphis, Tennessee, has a distribution center that receives and ships mixed product loads daily.

The Challenges

Shipments received are either warehoused or cross-docked to fulfill orders directly. Cartons of product are removed from bulk storage or hand-stack areas in order to replenish products which have been picked. The products are picked in schedules from one of 40 "pick zones" and are placed in picking totes which are then conveyed to 260 order-packing stations. Packed cartons are conveyed from the packing area to shipping, and picking totes are returned to the pick zones. Cartons are diverted to the appropriate shipping door and then loaded to complete the outbound shipments.

The manufacturer needed a tool that could model the entire distribution center so their planners could evaluate system throughput. The company partnered with RSConsulting Application Services to develop a tool that could be used to schedule the picking and packing staff and to reflect their interdependencies, as well as to evaluate several packing-station assignment algorithms.



The Deliverables

RSConsulting used Rockwell Software's Arena® simulation software to develop a flexible, data-driven model. The model included the receiving, warehousing, picking, packing, and shipping operations. A front-end Microsoft® Excel interface was developed for data input, which included shipment, receiving, and resource schedules; product storage locations; and packing lane assignment algorithms.

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For each day's shipment schedule, analysts could vary the model inputs through the Excel interface and investigate a number of order fulfillment strategies. The model included an animation of the facility so that management could observe the movement of packages, resources, and equipment throughout the facility. Output reports—including inbound and outbound shipment finish times, resource utilization, and the individual schedule completion times at picking and packing—allowed planners to correctly schedule and staff the distribution center. Facility throughput increased, while outbound shipping demands were met.

The Results

By using this model, client personnel gained insight into several aspects of the distribution system's performance. They discovered that picking too far ahead of schedule negatively impacted throughputs, so optimum pick schedules were designed to balance workloads and meet shipping requirements.

For More Information

To learn more about the Arena family of simulation products, visit www.arenasimulation.com. For more information about Rockwell Software, visit www.rockwellsoftware.com.

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Americas Headquarters, 1201 South Second Street, Milwaukee, WI 53201-2496, USA, Tel: (1) 414 382-2000, Fax: (1) 414-382-4444
European Headquarters SA/NV, Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific Headquarters, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

