

# Paper Company Improves Shipping Efficiency with Logistics Simulation

Arena® Simulation Software Facilitates Changes to Transportation Processes Resulting in Significant Cost Savings and Improved Customer Satisfaction

## Challenge

Reduce operating costs, improve order lead time and customer service.

## Solutions

Rockwell Software  
Arena Simulation Software

Logistics simulation model to evaluate changes to existing shipping systems before implementing in the actual operations.

- Understand impact on other parts of plant operations
- Determine costs associated with alternative approaches
- Provide what-if analysis tool to evaluate future enhancements to process

## Results

- Reduced shipping costs by \$1-3 Million Canadian
- Reduced order lead time by 33%, improving customer service
- Provided additional data to support a vendor contract negotiation to reduce overall shipping costs



## Background

In the highly competitive paper industry, it is imperative that manufacturers maintain high productivity rates and keep operating costs as low as possible. A major paper manufacturer located on the southwest coast of British Columbia, Canada, knows this as well as anyone. As the largest mechanical paper producer in western North America and the world's largest supplier of telephone directory paper, this company produces more than 1.8 metric tons of specialty paper, telephone directory paper and newsprint each year. The fundamental goals of their manufacturing and shipping branch are to improve order lead time and improve customer service – all while also reducing operation costs.

## Challenge

All of the company's manufacturing facilities are located on an island, so coastal barge is the major mode of transportation used to move raw material and finished products between the paper mill and the central warehouse. Barges were planned on a barge-to-barge basis to meet shipping delivery demands. Shipping and storage costs were a total of \$10 million to \$20 million Canadian each year. Barge fees were paid per tug, so each trip from the manufacturing facility to the central warehouse required payment. Cost was is dependent on the size of the barge.

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An order-fulfillment team coordinated barges for transport of wood chips and paper rolls based on the number of customer orders and time frames for delivery. As a result of the variance in barge loading times and scheduling, the order lead time between production facilities and the central warehouse was planned to accommodate the worst case scenario, slowing down delivery of the product to customers. The variance of the scheduling system not only had an impact on downtime costs, but also affected customer satisfaction with the delivery of the end product.

## Solution

To improve productivity and reduce order lead time, the company needed a logistics simulation tool that could visually analyze the benefits of switching from a barge-to-barge schedule to a more reliable, fixed barge schedule. The company selected Rockwell Software® Arena® simulation software, a tool that enables companies to model new or existing systems to better understand how they work. In this case, the company could use the Arena software to create a logistics simulation to test the fixed schedule design using customized variables before making scheduling changes. Having worked with the Arena application during a collegiate masters program, the company's logistics analyst, was already familiar with the technology. Using this previous knowledge about the technology, he implemented the Arena software directly on the barge transit system and programmed the software to model each of the factors in barge operation. The animation provided by the logistics simulation software program allowed the order-fulfillment team to view and manipulate the schedules under a variety of conditions. Using key inputs such as paper mill production rate, barge loading and unloading rates, barge number and transit time, the team could run the model using different scenarios. Other factors that affected barge transportation on a daily basis, such as weather conditions, also were incorporated into the simulation process. The company also simulated the cost side of the model to evaluate total cost and operational efficiency in regards to barge scheduling. By manipulating the data inputs, the order-fulfillment team could evaluate the benefits of a fixed barge schedule based on the output provided by the Arena software.

## Results

One of the most valuable aspects of the implementation of the logistics simulation model with Arena was the ability to visualize the operation under a fixed barge schedule. "Many of our stakeholders questioned whether a fixed schedule could handle the variances caused by unscheduled machine down time and weather conditions," said the logistics analyst. "The Arena simulation model was able to utilize historical data, including variances, and instant KPI results, which helped assure our stakeholders that fixed barge schedules were the way to go. The logistics simulation model is essentially a video game representation of the real business. Stakeholders can play with the model to try out scenarios that are not normally tested in real-time business."

With fixed barge schedules, the company was able to simplify the shipping process, shorten order lead time, reduce on-hand inventory and minimize product handling. The associated cost savings was estimated at \$1 to \$3 million Canadian per year. The company has implemented fixed barge scheduling and has reduced lead time in one of the company's production mills. With better visibility and predictability of the barge schedules, the order-fulfillment team was able to react to customer delivery requests quickly and efficiently. Last-minute customer order changes also were easier to accommodate through optimized production planning. Additionally, they now use the real-time business data generated by the Arena software in contract negotiations with barge suppliers. Using combinations of barge volume costs, hiring and towing costs helped the company's order-fulfillment team obtain the best possible pricing point for transportation services.

"In our industry, timeliness is essential. Using the Arena software, we developed a method to deliver our product quickly and efficiently to our customers. Rockwell Automation has provided us with the logistics simulation capabilities that we need to ensure the product quality that our customers have come to expect."

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