

Simulation Dynamics Takes The Guess-Work Out Of SCM

INDUSTRIAL ENGINEER · ADVERTORIAL · MARCH 2004

Effective supply chain management is a critical survival skill of corporations today. Most CEOs secretly wish for a “crystal ball” that can project the future well-being of their supply chain. Fortunately, as companies such as Insight Network Logistics (INL) have discovered, the use of simulation software technology in conjunction with corporate data does provide a crystal ball level of insight into their supply chains, allowing for an unparalleled opportunity to minimize the impact of unforeseen factors on their system.

Because simulation captures real-world system variability and sub-system event interactions through time, a simulation model can give planners a realistic view of what will happen in their supply chain under circumstances that do not currently exist, but might occur in the future.

“We use our supply chain model on two fronts – a strategic long-term planning front as well as a day-to-day tactical planning front which allows us to readily adjust for minor bumps in the supply chain,” said Roland Fortner, General Manager of INL, a subsidiary of Union Pacific Corporation.

INL is a third-party logistics provider (3PL), managing the new vehicle distribution network for a “Big 3” automobile manufacturer. Annually, 2.5 to 3.0 million vehicles flow through the network which consists of approximately 20 plants, 20 rail loading facilities, 60 rail unloading facilities, 10 ports, and 3500 dealers. In order to drastically reduce order-to-delivery times of vehicles and increase the overall efficiency of the supply chain, INL worked with Simulation Dynamics (SDI) to create an extensive simulation model of the system called VinLogic. This model is implemented in SDI’s Supply Chain Builder simulation software package.

According to Malay Dalal, Project Manager, INL chose to use SDI’s software because, “Supply Chain Builder’s architecture allows for easy modeling of common situations while remaining flexible enough to meet the custom needs of the auto distribution business. This extensibility was the key factor to the successful integration of the simulation model with VinVision within an accelerated time frame.”

VinVision, a vast corporate database system (VinVision) which contains the status of all vehicle shipments is a critical component of INL's vehicle distribution management toolset. This database is a "snapshot" of the current state of the network, containing every vehicle in the system, its origin, final destination, a history of vehicle "events" (a record of locations the vehicle passed through), and current vehicle location. SDI and INL worked together to create an interface from VinVision to the simulation model (VinLogic), allowing planners to create a picture of the current state of the network and then project forward into the future. "A key part of managing our system effectively is our ability to leverage the data from VinVision in our simulation model. This allows us to instantaneously run scenarios and determine our best course of action for reacting to pending crises such as a flood, hurricane, or labor strikes," says Mike Keller, INL Manager of Service Evaluation and Testing.

Using the VinLogic model, INL can also answer questions from carriers and facility operators (such as "What's coming at me?" and "When will it get here?") by projecting future volumes and expected times of arrival. If, for instance, a surge in volume is predicted, INL is able to plan ahead for equipment and manpower increases. Or, when a new vehicle launch and/or marketing campaign is announced, VinLogic is employed in order to evaluate release strategies so as to minimize the impact on the distribution network.

"Another huge advantage (to using the VinLogic model) is the added capability of tracking and reporting bottlenecks as they move around the distribution network," said Fortner. A custom feature which allows the user to identify a bottleneck, pause the simulation run, and look upstream and downstream of the bottleneck to further investigate and analyze has been a powerful asset of the model for INL.

Long-term supply chain decisions of network configuration and policy (such as closing old facilities or opening new facilities or changing routes or carriers) are analyzed in the model prior to implementation within the real supply chain. The model aids in long-term resource planning, such as shift rotations and fleet sizing. Since the model estimates future performance, it has also proven to be an excellent tool for goal setting and budgeting.

The end result is a simulation model that has become much more than just a corporate asset. INL's model is used on a daily basis for conducting studies ranging from simulating the impact of a hurricane on network operations to generating supporting data for railcar fleet size negotiations. "It would be difficult to quantify the ultimate value of the information that we glean from the model daily," says Fortner. In other words, the investment in the simulation software and services from SDI was the perfect alternative to using a crystal ball.

Advertorial published in *Industrial Engineer*, March 2004. Simulation Dynamics, Inc., 416 High Street, Maryville, Tennessee. Quotes from Roland Fortner, Malay Dalal and Mike Keller of Insight Network Logistics, a subsidiary of Union Pacific Corporation.