Supply Chain Guru

Model, Analyze and Optimize the End-to-End Supply Chain

Optimize Networks
Improve Product Flow
Right-Size Inventory

Simulate Service
Balance Production
Optimize Routes

LLamasoft
Supply Chain By Design
Supply Chain Guru: The Leading Supply Chain Design and Analysis Application

Ever ask yourself, ‘what if?’ Supply Chain Guru enables you to understand the answers through modeling, optimizing and simulating your supply chain network. You can design alternatives and explore the service, performance, costs and risks associated with change. All within a single integrated software platform.

**Intuitive User Interface**
Supply Chain Guru features the Visual Modeler to make network set up easy and intuitive. Project Navigator allows you to quickly move from scenario to scenario or model to model. Reporting is quick and easy, in a variety of maps, graphs and charts.

**Unified Database**
The system includes auto deployment of Microsoft® Access® or Microsoft SQL Server. It holds product data as well as demand, transportation, sourcing, inventory and production attributes.

Supply Chain Guru supports use of Esri, Bing, PC*MILER, PTV Map&Guide, Baidu, Here and nearly any other GIS or mapping provider

**Design Engine**
The Design Engine contains multiple integrated solvers—operations research algorithms—that perform network, product flow, cost-to-serve, inventory and transportation optimizations as well as greenfield and demand analysis. Enterprise simulation allows designs to be simulated and validated under real-world constraints.

**Scenario Management**
Test multiple inputs quickly, without copying, pasting and running several models individually. Scenarios allow users to input a range of values for a particular field, such as service level, transportation cost, or production capacity and then automatically run an optimization or simulation. Scenario results are consolidated into a single database for ease of analysis. Future data updates are also far simpler as only a single data set needs to be updated.

Among the many graphic analytics, this series of maps offers a visual representation of balancing transportation costs, DC locations and service constraints.
With Supply Chain Guru You Can Answer the Most Complex Supply Chain Question: “What If?”

**Design and Optimize Your Supply Chain**
Supply Chain Guru offers multiple options for finding hidden inefficiencies in the supply chain. Models contain SKU level detail, run across multiple time periods, and incorporate end-to-end supply chain components, including transportation and sourcing costs and policies, network structure, inventory, service level, and operational details.

**Model Different Inventory Options**
LLamasoft’s inventory and capacity modeling enables analysts to create accurate models across all echelons of the supply chain, so the lowest-cost operation plan with minimum safety stock can be identified. You can also simulate operations to predict service rates, inventory levels, and site capacity constraints for any hypothetical supply chain structure.

**Analyze Cost to Serve**
Supply Chain Guru is adept at modeling all supply chain activities and costs incurred to fulfill customer demand. Pricing, inventory quantities, and distribution methods can be analyzed and adjusted. Supply chain executives gain insight into the cost-to-serve and margin-to-serve at the customer-SKU level for both existing and alternative networks.

**Optimize Product Flow**
Analyze how SKU-level products flow along transportation lanes, through distribution centers on to your customers. Supply Chain Guru can help you determine which products should be shipped via air, rail, or truck, and the appropriate distribution path to meet determined service levels while minimizing transportation costs.

**Transportation Modeling**
Take a holistic view when modeling alternate transportation options with key variables such as cost, time, capacity, and delivery parameters. Create optimal transportation plans based on total cost and service constraints. The system will also help determine the optimal number and location of transportation assets and identify hub and zone skipping opportunities.

**Sales and Operations Planning**
S&OP can be a key driver for improving resource utilization and maximizing return on assets. Optimization of very large models can be performed quickly and easily, and S&OP is easily integrated with disparate data sources throughout your enterprise.
Merger and Acquisition Rationalization
Model competing supply chains, evaluate their relative strengths, examine alternative structures, optimize the proposed new network, and simulate multiple scenarios in order to predict the resulting financial and operational performance of a merged or divested enterprise. Transportation lanes, inventory strategies, and greenfield facility options can be optimized for a post-merger supply chain.

Optimize to Lowest Landed Cost
Identify the lowest total landed cost for each product in the network—from suppliers through to end customers. Alternative demand scenarios can be evaluated to determine the sensitivity of different supply chain designs to demand forecast variability. These models also provide a unique product-flow optimization using our proprietary product decomposition algorithm, which enables the optimization of individual SKU flow-paths, even with thousands of individual part numbers.

Risk Analysis and Contingency Planning
Identify alternate sources, routes, transportation modes, or production processes that may be required during supply chain disruptions. Analysts can introduce disruptive events or supplier uncertainty into the model to get a better understanding of the robustness of their supply chain. The integrated simulation functionality identifies both physical and financial risks—or rewards—of various network scenarios by revealing the effects of irregular network capacity during short or long-term emergencies.

Improve Your Strategic Sourcing
Now you can define and quantify alternatives to support your business strategy. Cost vs. time, inventory vs. service, fixed costs vs. variable costs; Supply Chain Guru’s unique technology models the entire supply chain network to determine how sourcing decisions will affect business as a whole.
Supply Chain Guru System Features

Network Optimization
- MIP/LP solver engine runs natively on 32 and 64 bit systems
- Detailed costing and behavioral characteristics for all key supply chain elements
- Step functions to model fixed asset configuration options
- Multiple constraints for product flow, facility capacity, inventory, transportation
- Optimize production processes and identify optimal footprint
- Multi time-period analysis for long-term capital planning and short-term tactical planning
- Multi-objective optimization automatically optimizes to and provides insight into tradeoffs between any two of 19 available objectives
- Sequential optimization enables prioritization of objectives by solving for multiple objectives in sequence
- Greenfield analysis determines optimal locations for new plants and distribution facilities
- Cloud solving saves time and offloads work from individual workstations by running dozens or hundreds of scenarios in parallel

Transportation Optimization
- Minimize cost, miles and time, using your company’s rate structure
- Right-size your vehicle fleet and determine which vehicle types minimize overall transportation costs
- Identify optimal mode mix
- Identify trade-offs between multi-stop routes and direct shipping via LTL or parcel
- Evaluate hub and zone skipping opportunities: determine whether customer deliveries should route through a hub from a distribution center or shipped direct

Multi-Echelon Inventory Optimization
- “Guaranteed service” algorithms for determining optimal safety stock levels and placement
- Segment key product attributes including velocity, margin, demand variability, demand quantity, cost, lead time, etc.
- The demand analysis algorithm analyzes and classifies demand patterns and recommends right-sized end-to-end stocking levels and ordering strategies
- Accurate customer demand information propagated to all upstream nodes considering correlation of customer buying patterns and replenishment frequencies of upstream nodes
- Test and validate inventory optimization results using enterprise simulation
- Service level optimization helps identify the right service level mix by minimizing costs or maximizing profit in order to meet organization’s business goals including budget constraints

Product Flow-Path Optimization
- SKU-level MIP/LP optimization solver scales to handle all products in the supply chain
- Trade off transportation, replenishment, inventory, and cycle stock to determine lowest “total landed cost”
- Determine flow changes based on seasonality or capacity constraints

Discrete Event Simulation
- Simulation engine fulfills demand using an event calendar
- Probability distributions for all key time and quantity variables, such as demand, transportation time, sourcing lead time, production processes, etc.
- Scalable to handle thousands of SKUs
- Animates supply chain flows geographically
- Simplified Python scripting for faster solve times

Data Integration, Data Editing and Error Checking
- Automated MS Excel import/export
- Real-time connection to external data sources via input pipes
Utilize continuous moves interleaved shipment route optimization to identify cost minimizing efficient routes while right sizing fleet size.

- Automated demand sampling tool enables more accurate safety stock optimization using historical information combined with forecast data
- Data Services offers reference and benchmark data to reduce model building time and validate inputs and outputs
- Integrated with Data Guru, which simplifies the transformation of model data and creates documented, repeatable, time-saving workflows
- Data filtering and batch editing
- Scenario generation utilities
- Error checking
- Data verification and error handling utilities
- Automatic infeasibility diagnosis option identifies constraint violations and eliminates infeasible models to reduce modeling time and time-to-answer

Visualization and Reporting Tools

- Visual modeling and flow chart views of supply chain
- Global geo-coding capabilities including distance and service time
- Supply Chain Guru supports use of Esri, Bing, PC*MILER, PTV Map&Guide, Baidu, Here and nearly any other GIS or mapping provider
- Service-area map layers visually display hours/days required to service various geographic areas
- Shaded area mapping to visualize demand, cost, revenue and service metrics geographically
- Risk exposure summaries and indices highlight potentially volatile network designs to help guide additional scenario analysis
- Pre-configured graphs and reporting, including: rolled up financials, production details, transportation details, product landed costs, and facility costs
- Ad-hoc reporting
- Configurable charts and graphs with access to all cost data
- Publish reports to third-party reporting packages