



Industry Solution Sheet: Supply Chain

Challenges and Capabilities

There are many different types of companies (from manufacturers to retailers to logistics, MRO, and other service providers) from many different industries operating in the supply chain space, but they all face the same fundamental challenge: Keeping supply and demand in balance.

This may sound simple in theory, but in reality, aligning supply and demand is a major challenge for companies due to:

- The complexity, volatility, and disruption throughout today's global supply chain landscape – which is made up of intricate and interconnected supply, production, distribution, and retail networks spanning the world.
- The uncertainty and risk inherent in today's supply chain dynamics – which are prone to severe and sudden fluctuations on both the demand side and the supply side.
- Increasing operating costs and intense competition for market share – which put immense pressure on profit margins.

To keep supply and demand in balance and deliver products and services to customers in the most efficient and profitable manner possible, companies today need to leverage the most powerful data-driven, analytics-based technologies – and, without a doubt, mathematical optimization is one of those technologies.

With mathematical optimization, your company can effectively manage your supply chain by becoming:

- **Reactive**
Utilize your real-time data to make optimal business decisions – so that you can react and respond rapidly and effectively to changing conditions and disruptions across your end-to-end supply chain.
- **Proactive**
Use your historical and real-time data as well as forecasts, and what-if scenario analysis to optimally design and configure your supply chain network – so that you can make the best possible strategic and tactical decisions and proactively identify and handle uncertainty and risk.

- **Efficient**

Optimize your operational efficiency and automatically balance the tradeoffs between conflicting business objectives (such as maximizing profitability and customer satisfaction and minimizing costs and risk).

Leading companies around the globe and across numerous industries use mathematical optimization technologies – in a vast array of different applications – to optimize their supply chain planning, decision making, and operations.

With mathematical optimization, you can:

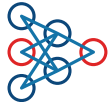
- Make dynamic, data-driven decisions that optimize your company's efficiency and profitability.
- Attain visibility, agility, and control over your end-to-end supply chain network.
- Achieve your business goals by balancing cost and service-level tradeoffs – simultaneously satisfying customer demand and spurring bottom-line growth.
- Transform your supply chain from a source of costs into a source of competitive advantage.



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Opportunities for Optimization

Mathematical optimization is used by companies today to optimize many different strategic, tactical, and operational planning and decision-making processes across their end-to-end supply chain operations including:



Strategic

- Supply Chain Network Design
- Transportation Mode Selection
- Supplier/Vendor Selection
- Labor Strategy Optimization
- Yield and Revenue Management
- Capacity Planning



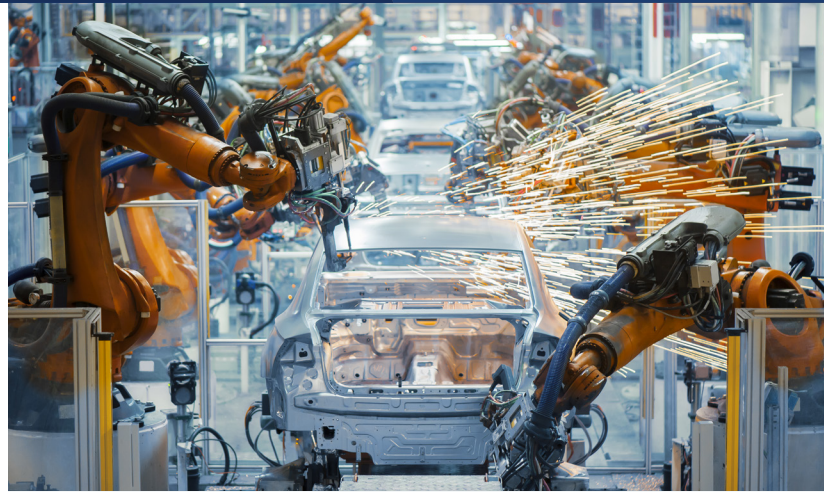
Tactical

- Inventory Optimization/Positioning/
Safety Stock Optimization
- Maintenance Planning/
Predictive Maintenance
- Production Planning
- Supply Planning
- Demand Sensing/Forecasting/Planning
- Project-Based Planning
- Order Fulfillment Planning
- Spare Parts Inventory Planning
- Sales & Operations Planning
- Workforce/Shift Planning
- Replenishment Planning



Operational

- Vehicle Routing
- Workforce Scheduling/Rostering
- Resource Allocation/Utilization
- Project and Machine Scheduling
- Logistics/Shipment Planning and Routing
- Real-Time Dispatching



Business Benefits

Companies utilizing mathematical optimization technologies to manage their supply chains are able to realize numerous business benefits including:

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| • Better resource utilization | • Greater revenue growth |
| • Reduced costs (for operations, inventory, procurement, workforce, equipment, etc.) | • Shorter planning cycle times |
| • Improved profitability and ROI | • Risk reduction/mitigation |
| • Optimized operational efficiency | • Improved inventory turn-over and fewer stock-outs |
| • Better OTIF delivery performance | • Greater supply chain visibility and agility |
| • Higher customer satisfaction | • Better cross-functional and end-to-end supply chain alignment |

Example Customers

Here is a selection of Gurobi customers that use mathematical optimization to revolutionize their supply chain operations:





