Supply Chain Optimization

INFINITY|Q⟩

Your Challenges

- **Inventory Management**
- **Vehicle Routing**
- **Sustainability and Environmental Impact**
- **Manufacturing Efficiency**

Benefits

- **Cost Reduction**
- **Greener**
- **Improved Efficiency**
- **Enhanced Customer Satisfaction**
- **Easily Accessible**
- **Avoids Penalty Fee**
- **"Transforms Weeks Into Seconds"**

What is TitanQ

Harnessing the power of probabilistic computing, TitanQ swiftly identifies optimal and near-optimal solutions for complex problems. Its probabilistic algorithm stochastically navigates the extensive space of potential solutions, delivering a set of viable answers to any given problem. Before our technology, solving these large-scale problems required days to years, or they were deemed "impossible". TitanQ enables you to solve these complex problems in mere seconds

Routing and Zoning

Route and Zoning Optimization: For transportation-intensive supply chains, optimizing delivery routes and zoning can lead to cost savings and reduced carbon emissions. Algorithms can consider factors like vehicle capacity, traffic conditions, resources and delivery time windows to minimize fuel consumption and improve delivery efficiency.

Scheduling

Production Planning: By optimizing production schedules and resource allocation, companies can reduce idle time, minimize changeover costs, and improve overall equipment effectiveness (OEE). Optimization models can balance production capacity with demand variability, ensuring that production facilities operate at maximum efficiency.

Coordination

Warehousing Optimization: Optimal warehouse layout design, picking strategies, and storage policies can improve order fulfillment speed and accuracy while minimizing handling and storage costs. Optimization models can determine the most efficient storage locations for different products based on demand patterns and handling requirements.

Inventory Management: Optimization algorithms can determine the optimal inventory levels at different points in the supply chain, considering factors such as demand variability, lead times, and storage costs. By maintaining the right amount of inventory, companies can reduce carrying costs while ensuring products are available when needed.

How we have helped.

Use Case: Energy Grid Optimization

Problem: Maximize green score while minimizing cost to source power from various power providers

Formulation possibilities:
Constrained power maximization problem

Solution:
Real time grid optimization capabilities for grid rebalancing

Use Case: Robust Supply Chain Optimization

Problem: Build a robust supply chain that can meet customer deadlines to avoid costly penalties while withstanding potential shocks and minimizing costs

Formulation possibilities:
Smart supply chain scheduling, with additional slack between steps and multi-supplier awareness

Solution:
Two-part solution:
- Initial planning of robust schedule
- Method to replan given supply chain shock

Use Case: Port Optimization

Problem: Automated ports require advanced dynamic optimization capabilities to reroute cranes & containers effectively

Formulation possibilities:
On site/cloud planning of production capabilities using mixed-integer optimization platform

Solution:
Real-time FPGA/GPU system capable for dynamic crane & container loading planning

Use Case: Middle Mile Delivery

Problem: Automated ports require advanced dynamic optimization capabilities to reroute cranes & containers effectively

Formulation possibilities:
On site/cloud planning of production capabilities using mixed-integer optimization Platform

Solution:
Real-time FPGA/GPU system capable for dynamic crane & container loading planning

Our Results

The current approach to scheduling involves extensive manual effort, leading to high costs and suboptimal outcomes. Our algorithmic solution significantly reduces scheduling time, providing substantial savings and demonstrating the efficiency of algorithmic optimization in supply chain management. Previously, we have helped shave 1.5 months off of a 15-month project by transforming this multiple week process into mere seconds.

An energy grid we have assisted with previously utilized DWave for fast modeling but faced constraints due to its limited support for binary variables. We revamped the modeling using full continuous variables, resulting in improved cost efficiency and environmental impact. Our solution achieved either a 4% better green score for the same cost or a 2% lower cost for the same green score.

One company previously relied on an in-house routing solution that required approximately one hour to execute and often necessitated manual adjustments by internal staff. Our solution not only met their expert Key Performance Indicators (KPIs) but also drastically reduced runtime to just three minutes.

Access Us Anywhere.

Book Your Demo Today

+1 (438) 558-2790

sales@infinityq.tech

614 Rue Saint-Jacques
Suite 150
Montreal Quebec
H3C 1E2 Canada

Follow us on LinkedIn @InfinityQ Technology Inc