

Centre for Operations Excellence

Logistic Planning and Optimization for a Beverage Manufacturing and Distribution Company

Client Profile

A private Canadian beverage manufacturing and distribution company launched a new and instantly popular brand two years ago. The company has production facilities and warehouses across North America.

Business Challenge

The company's recent expansion into the US market involved setting up a manufacturing, logistics and distribution system in the US. They approached the Centre for Operations Excellence (COE) to find ways to enhance this system. The COE worked with the company to determine the optimal production levels, optimal distribution of products and optimal inventory levels. The COE also proposed the development of a tool to be used by company planners for operational and tactical level decisions such as production, transportation and inventory levels, and inventory capacity expansion, warehouse reallocation, and price negotiation for raw material.

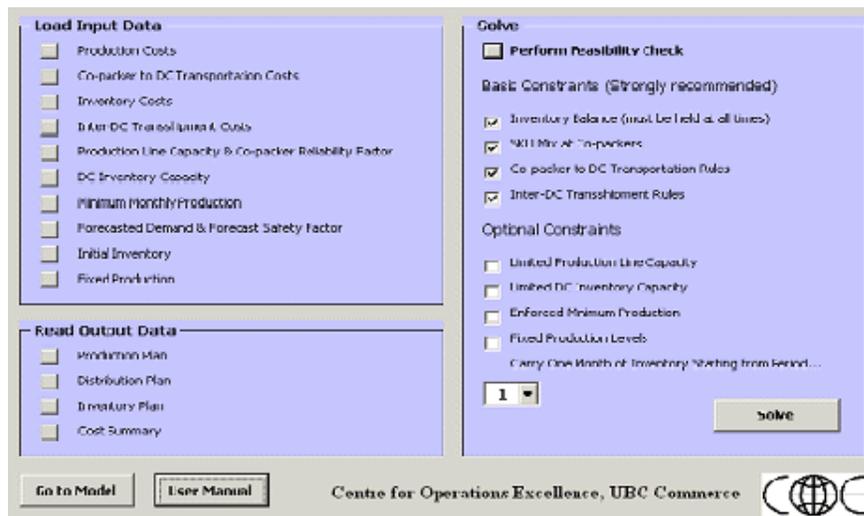
Value Delivered

The COE developed a computer-based planning tool called the Aggregate Logistics Optimization Tool (ALOT). For each product, ALOT could find:

- The optimal production level of each production facility
- The optimal distribution from production facility to warehouse, and an optimal transshipment plan between warehouses
- Optimal warehouse inventory levels

The tool enabled company planners to explore the tradeoff between the different decision-making parameters. The COE designed the tool with a user-friendly input screen (see below). ALOT has been used for tactical and operational decisions and was expected to produce significant cost savings for the client.

The COE Approach



The screenshot shows the ALOT software interface. It is divided into several sections:

- Load Input Data:** A list of input parameters with checkboxes, including Production Costs, Co-packer to DC Transportation Costs, Inventory Costs, Inter-DC Transportation Costs, Production Line Capacity & Copacker Reliability Factor, DC Inventory Capacity, Minimum Monthly Production, Forecasted Demand & Forecast Safety Factor, Initial Inventory, and Fixed Production.
- Read Output Data:** A list of output options with checkboxes, including Production Plan, Distribution Plan, Inventory Plan, and Cost Summary.
- Solve:** A section for solving the model. It includes a checkbox for "Perform Possibility Check", a sub-section for "Basic Constraints (Strongly recommended)" with checked options for Inventory Balance, No Inter-DC Transpackers, Co-packer to DC Transportation Rules, and Inter-DC Transshipment Rules, and a sub-section for "Optional Constraints" with unchecked options for Limited Production Line Capacity, Limited DC Inventory Capacity, Enforced Minimum Production, and Fixed Production Levels. There is also a text input field for "Carry Over Month of Inventory Starting from Month..." and a dropdown menu set to "1".
- Buttons:** "Go to Model" and "User Manual" buttons are at the bottom left. A "Solve" button is at the bottom right.
- Footer:** "Centre for Operations Excellence, UBC Commerce" and a logo are at the bottom center.

The company provided the COE with necessary data and information to create a model - production, inventory and transportation costs, production and warehouse capacities, forecasts and business details. The COE developed a software tool that used linear programming to create a model to minimize the total costs and to produce a logistics and distribution plan while obtaining the necessary business constraints.