Supply Chain Strategist

Solution Capabilities

Enable Robust and Complete Strategic Analysis

In many companies, strategic planning decisions are made by separate teams focused on their portion of the enterprise. These important decisions are often made using complex spreadsheets developed to address a specific problem — a task that is often tedious, cumbersome, and unrepeatable. It also separates different parts of the strategy, which can lead to problems interpreting and reconciling the analyses of different groups.

i2 Supply Chain Strategist™ provides a modeling and optimization environment that is capable of representing the appropriate breadth and depth of the supply chain required to answer the strategic questions at hand. In some cases, this means modeling the entire supply chain from raw materials to finished products and their customers. In other cases, the model may be limited to a particularly troublesome portion of the supply chain or one that has been significantly affected by a recent merger or acquisition. Unlike spreadsheet models that simply act as sophisticated calculators, i2 Supply Chain Strategist determines a truly optimal network design.

i2 Supply Chain Strategist creates a major advantage for its users by making the strategic planning process repeatable and standardized. Instead of conducting ad hoc spreadsheet analysis, planners become competent users of a powerful modeling and analysis tool, and the company builds a core competency in strategic planning. i2's most successful customers build an internal competency using i2 Supply Chain Strategist during the first implementation and then go on to do subsequent analyses that drive additional value in their supply chains.

Optimize Key Decisions

The objective of a strategic planning study is to maximize profitability by meeting demands, maintaining service levels, and adhering to network constraints. Using i2 Supply Chain Strategist, the modeler chooses whether all demand should be served or whether some should be discretionary. This allows the strategic planner to tailor service levels for different types of customers.

i2 Supply Chain Strategist makes both continuous decisions (e.g., "How much of product ABC should be made in Chicago?") and discrete decisions (e.g., "Should Philadelphia or Newark be chosen for a new distribution center location?") in the same optimization. These decisions can be applied to the entire planning horizon or to individual periods. Whether creating a multiyear strategic plan or an 18-month strategic master plan, the strategic planner uses the same flexible application. There's no need to employ multiple applications or purchase add-on modules to use the product for different time-period structures. i2 Supply Chain Strategist bases all decisions on net present value, automatically considering the time value of money.

For more than 10 years, i2 Supply Chain Strategist has been helping companies optimize their supply chain design to meet their business objectives. The solution supports key strategic decisions at each stage of the supply chain — from raw materials procurement to finished goods distribution. It provides insight into the complex trade-offs between alternative strategies for site location, manufacturing facility missions, transportation, inventory deployment, and environmental sustainability. i2 Supply Chain Strategist has hundreds of satisfied customers in various industries, ranging from commodities to consumer goods, manufacturing to retail, as well as third-party logistics and transportation providers.

Investigate a Wide Range of "What-if" Scenarios

With a powerful, flexible, and straight-forward modeling paradigm, strategic planners can investigate a wide range of what-if scenarios. Using reusable reports of key performance indicators, the relative value of the scenarios can be compared from either a cost or profit perspective. Many scenarios can be run and their results compared using standard desktop tools. Because each scenario can be saved in a compressed, self-contained format, preferred scenarios can be accumulated, and less attractive ones can be efficiently discarded.

Using the "Solver Include" functionality, portions of the network can be temporarily excluded from consideration without deleting the corresponding model structure. For example, a given distribution center can be disabled, and the effects of this change on the optimal network can be investigated. This capability allows the strategic planner to quickly consider alternative scenarios and easily return to an earlier, more attractive scenario if desired.

i2's Differentiation

Intuitive Modeling of the Supply Chain and Business Constraints

i2 Supply Chain Strategist models are built with a handful of flexible modeling entities that can be readily combined to represent the required level of detail in the supply chain model. Instead of containing a rigid echelon structure of suppliers, manufacturing plants, and distribution centers, the solution provides the flexibility to model the applicable echelons to the supply chain in question.

The following represent the modeling entities available in i2 Supply Chain Strategist:
- Facilities
- Processes
- Products
- Transportation modes
- Shipment sizes
- Service levels
- Demand regions

By modeling these entities and their interrelationships, the simplest and most complex supply chain network can be represented. The supply chain network can be developed through the intuitive, data-driven user interface or through desktop tools like Microsoft Excel® and Access®. Data from these applications, as well as from commercial databases like Oracle®, DB2®, and SQLServer®, is easily imported to i2 Supply Chain Strategist.

The solution enables the planner to represent all relevant supply chain costs, including:

- Processing and product handling costs
- Transportation costs
- Inventory costs
- Fixed costs for operating, opening, and/or closing model entities, by time period if desired

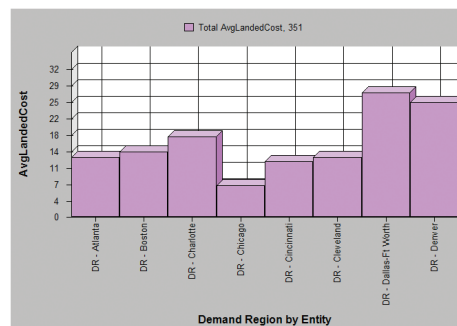Key Performance Indicators for Optimal Network

Costs and prices can vary across time periods to represent seasonal variations or market dynamics. i2 Supply Chain Strategist also supports multiple currencies. Currency conversion factors can change between time periods, enabling sensitivity analysis with respect to exchange rates. This capability is especially useful for companies with multinational manufacturing capabilities that want a better understanding of the optimal supply chain under different global currency conditions.

Landed cost represents the buildup of cost that occurs as a product flows through the supply chain. In i2 Supply Chain Strategist, landed cost can be viewed for many different dimensions—by product, demand location, time period, and more. Landed cost for the optimal network is calculated automatically after each optimization run.

Some key modeling features of i2 Supply Chain Strategist include:
- Model time periods can have similar or different lengths to meet the needs of the strategic study.
- Key decision variables have minimum and maximum fields for simple constraint definition.
- General-purpose selection constraints enable modeling of complex business constraints such as cross-facility capacities in a comfortable tabular format.
- Inventory representation is at the appropriate level of detail: "power curve" inventory for facility location models and days-of-supply inventory for more tactical models.
- Bundling allows demand requirements to be grouped together. Once grouped, single-, multiple-, or proportional-sourcing constraints can be applied.

Solving Capabilities

i2 Supply Chain Strategist contains a mature, robust engine that uses the latest linear/mixed-integer technology to efficiently solve strategic planning problems. By leveraging a mathematical programming approach, solutions are truly optimal and not based on heuristics or "rules of thumb" — providing users peace of mind when making significant supply chain network decisions such as long-term, capital-intensive investments.

The solution's optimization server automates many workflows that would otherwise be achieved through the user interface. Multiple scenarios can be run sequentially in a "hands-off" mode, and repetitive data management tasks can be performed automatically in a simple tabular scripting. Repetitive workflows are easier to execute, enabling strategic planners to spend more time on value-added tasks such as scenario analysis and running additional scenarios. Sensitivity analysis is also easier to perform, allowing the modeler to test how variation of key variables affects the profitability and design of the network. The optimization server is included as part of i2 Supply Chain Strategist.

Outstanding Analytic and Reporting Capabilities

An important capability in strategic planning is the ability to clearly demonstrate optimization results in a variety of highly graphical formats. These visualization components lend a degree of understanding to strategic planners that is unmatched by common tabular data displays.

- *Thematic maps* visually demonstrate network topology and activity. They use region shading, relative sizes and colors of icons, and line colors to distinguish between activity levels.
- *Charts* capture significant network data clearly and concisely. The planner can interactively change the data to be displayed and the grouping parameters.
- *Summary views* are snapshot reports that dynamically capture key performance indicators of the optimized network. Summary views can be easily configured to show various network costs, number of active facilities, transportation mode utilization, and carbon footprint to name a few.

All of these views share valuable common features. They are dynamic — changing as soon as the underlying data changes — and highly configurable without requiring any programming. Views can be cut and pasted into desktop presentation applications, and they are savable and reusable for multiple scenarios in what-if analysis. In addition to output views, all data can be easily exported to external databases for further analysis through Excel or other reporting tools.

For more information about i2 Supply Chain Strategist or other i2 solutions, please visit www.i2.com.

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