Answer: An Enterprise Business and Facilities Planning System

By Thomas R. Cutler

A machine at a manufacturing plant has just gone down. The estimate of the engineers is between two weeks and a month of down time on the machine. How does a manufacturer minimize the impact of the outage on the ability of the organization to service its customers, while maintaining at the least possible cost?

A manufacturer is working on production, inventory and distribution plans for the organization for the next fiscal year. Total capacity is adequate to handle the demand over the entire fiscal period. However, there are long periods within the fiscal year in which there are significant capacity shortfalls. The result is that inventory must be built up during periods of capacity excess in order to accommodate the customer demand during the periods in which there are short term capacity shortfalls. Where should the inventory be placed, and what should the product mix be, in order to insure high levels of customer service at the least possible cost?

A growing enterprise is looking at adding an additional distribution and manufacturing facility. The number of possible sites has been reduced to a total of six. Based upon projections of the demand for products, where is the best place to put the new facility, taking into account local labor costs as well as transportation costs?

There are numerous truckloads of product to be delivered to customers throughout the country. What carrier should be assigned to handle each load so that a company might simultaneously maximize on-time delivery service to the customer and minimize transportation costs to the organization?

A manufacturer is in the enviable position of being in a capacity constrained environment. Should the company make the products that will result in the greatest profit to the company, the ones that minimize the company's costs, or simply service all business using a capacity allocation algorithm, and what are the cost implications of each decision?

Answer: An Enterprise Business and Facilities Planning System

Most planning systems on the market today have two basic limitations. First, they assume that a manufacturing, warehousing and logistics network will always have sufficient resources available to do the work that needs done; they assume infinite capacity. The second area in which these systems fall short is they rarelyprovide an answer that minimizes the cost to the organization (or, alternatively, maximizes profit); various internal and external constraints placed upon the organization, such as labor availability, warehouse input and output capacities, storage capacity and the ability of carriers to deliver products are rarely taken into consideration. Most enterprise business and facilities planning systems do not generate an optimal solution based upon the current operating constraints.

There are a few Enterprise Business and Facilities Planning systems which eliminate both of these shortcomings. A sophisticated state-of-the-art linear programming model is required that uses optimization tools to quickly and easily solve extremely complex business problems. The value must provide a solution that represents the bestsolution for a business based upon the current and projected operating environment.

Rebecca Gill, vice-president with Technology Group International, an Enterprise Business and Facilities Planning provider noted that, "The system integrates diverse input parameters, which describe your current business environment, to derive a single coherent optimumsolution to any distribution and/or manufacturing related business problem. The system handles manufacturing constraints such as total labor availability at a facility, manufacturing labor requirements by product, multi-step routings and variable production rates. Distribution constraints include warehouse storage and inbound/outbound handling capacities, as well as carrier availability, capacity, and cost by mode (such as 53' van, 48' van, TOFC, rail, flatbed). Moreover, the system is designed so that it can readily be used in a wide variety of business environments. These include process, discrete, repetitive and make to order manufacturing environments, as well as both single and multi-location distribution environments."

Surrounding this linear optimization process must be a series of extremely user friendly graphical user interface (GUI) application interfaces that make creation, use, solution and interpretation of even the most complex business situation easy and straight forward. Output information must be viewed through generation of a series of reports that include production plans and schedules, facility service areas by product and inventory levels by storage location and type.

A variety of model configurations should be easily selected by the user. These configurations must allow the solution of problems ranging from long range facilities planning and analysis, to short term tactical planning, production scheduling, and carrier assignment. By simply changing a single selection, the user must be given the ability to find answers to questions starting out at a highly aggregated level, and then drill down to solutions at progressively more detailed levels.

The systems interfaces must allow data to be stored in the system at an extremely detailed level for use in daily execution

planning of production schedules, labor requirements and restrictions, and carrier selection. Using user defined rules in conjunction with this same detail information, the system must provide the user with the capability of aggregating the information into groupings of data types from individual SKU's being aggregated to form product groupings, for purposes of engaging in long or intermediate range facilities planning and analysis tasks.

The best Enterprise Business and Facilities Planning Systems have the ability to interact with any business system. This interaction can take a variety of forms. In its most simplistic form, data from existing business information system is exported into flat files (such as EXCEL spread sheets), which are then read by the system. At the most sophisticated level, the interaction is handled through a direct link between the Enterprise Business and Facilities Planning system and existing business information system.

The Enterprise Business and Facilities Planning system can benefit companies of any size, however some of the criteria for maximum benefit include:

- If there is a well established mature manufacturing and logistics network, Enterprise Business and Facilities Planning can help to maximize the benefits derived from the company network by reducing warehousing and transportation costs, improving customer service and improving production planning accuracy.

- For organizations with young or growing logistics requirements, the system can help to identify where to locate a new plant or distribution center to both minimize cost and maximize service to customers.

- For smaller organizations operating from a single facility, the system can help insure that overall manufacturing and distribution costs are minimized, and that inventory is at the correct levels making products available at the right times to meet customer demand.

- Transportation personnel will find that the Enterprise Business and Facilities Planning tools help to reduce transportation costs, improve customer service, and reduce the amount of time spent in the task of carrier assignment and management.

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