The Power of Analytical Modeling

GEI, Inc. has the ability to construct analytical models of common business situations and to solve these models for optimal results using mathematical programming techniques. Analytical models provide insight into the nature of underlying problems and give the decision maker additional tools for developing policies and business rules. Analytical approaches used to be out of the reach of most businesses but advances in computing and software have made it possible for GEI, Inc. to offer mathematical programming and simulation solutions to our clients.

Sample Problems

Base Stock, Max/Min, Safety Stock and other types of stocking policies: Selecting the appropriate type of inventory policy is dependent on frequency of review, setup or shipping costs, lead-time, capacity, and other issues. In addition to helping you select the right type of policy, GEI, Inc. can determine the stocking point values and provide specially designed software to determine other values in the future.
Domestic Production vs Off-shore Purchasing: The conventional wisdom of buying all products from a low cost off-shore supplier may be shown to be in error when safety stock levels and inventory investment are taken into account. GEI, Inc. can develop an analytical model of this type of situation and supply software for you to examine various scenarios.
Optimal Container Loading and Multiple Container Mix: Loading trucks, containers, and boxcars to best advantage is a recurring problem for many firms. These types of problems can be modeled as mathematical programming problems and solved for best results.
Job Assignment: Assigning jobs to workers or machines cannot always be done satisfactorily with simple rules and human decision-making. Large scale problems, such as assigning work to technicians in a call center, need to be re-solved frequently throughout the day when jobs take longer than expected, new jobs with higher priorities arrive, or when a deadline changes. Through the proper development of a task-and-time database and situational-specific mathematical programming, the re-assignment of work can be performed in near real time.
Layout Changes: Changing the layout of your facility can result in significant increases in open area and reductions in cost and work in process. However, these changes can be costly. Analytical modeling can help identify an optimal layout and simulation can demonstrate the advantages of the layout before any physical moves are made.
Capital Equipment Decisions: Capital equipment purchases can be evaluated with the techniques of mathematical programming. GEI, Inc. can assist you with making choices appropriate for your organization.
Training: GEI, Inc.'s PhD trained operations specialists apply their education and experience to highly integrated solutions. These individuals are qualified to train your employees in methods that will improve their abilities to manage and to make effective operating decisions.

Computer Skills

Some problems can be modeled and solved from within a stand-alone spreadsheet. Others require server level databases and software that reside on the client's computers or are purchased through an applications service provider.

An Example

A client was trying to decide how much, if any, product should be manufactured domestically as opposed to being purchased from an Asian supplier. GEI, Inc. worked with the client to understand its business, its inventory rules, its costs, and its lead times. We developed a proper stocking model for its environment, constructed a mathematical programming model of the situation, and provided a spreadsheet-based solution that the client could examine under different inputs for product mix proportions and for sensitivities. Furthermore, GEI, Inc. supplied the client with all the mathematical modeling data so the client could have it verified by a third party if desired.

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