



Interfaces

Publication details, including instructions for authors and subscription information:
<http://pubsonline.informs.org>

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To cite this article:

(1985) The CPMS/TIMS Award for Management Science Achievement. *Interfaces* 15(1):1-2. <https://doi.org/10.1287/inte.15.1.1>

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The CPMS/TIMS Award for Management Science Achievement

The vitality and impact of management science is strongly demonstrated by the 1984 Management Science Achievement Award finalist papers presented in this issue of *Interfaces*. Readers of these papers will find reports of

(a) A major reorientation of the entire national water management policy of the Netherlands, where water resources problems are among the most important issues faced by the country. Among the impacts of the project were substantial changes in plans for future construction projects, changes in water-use regulations on industry, and recommendations touching on international cooperation in water-use and pollution control.

(b) A complete overhaul of the forecasting, production planning, and inventory management policies of Blue Bell Inc., one of the world's largest apparel manufacturers. At Blue Bell inventory related investments were 50 percent of the firm's assets, and the project was credited with reducing inventories by 25 percent and saving more than \$1 million in manufacturing costs — all while improving customer service.

(c) An improved method of loading combat materiel and personnel into Air Force transports during contingency airlifts, which can reduce by 90 percent the manpower needed to plan airlifts, increase the responsiveness and flexibility of the operations, and increase aircraft utilization by 10 percent. The system,

which runs on a portable microcomputer, was credited with greatly improved airlift performance during the Grenada rescue operations.

(d) New inventory planning models used at Pfizer Pharmaceuticals to achieve dramatic reductions in inventory related costs while maintaining the firm's traditional commitment to the highest levels of customer service. Indeed, it is claimed that while increasing ROI by an astounding 20 percent, customer service levels jumped to a record 99.9 percent.

(e) An integer programming model used by Monsanto to optimize the operation of a maleic anhydride conversion process that produces 45 percent of the US supply of this important chemical. Savings are estimated at between \$1 to \$3 million annually, and the project's success has revitalized other management science efforts at Monsanto.

(f) An application of set covering models in Austin, Texas, used to analyze the complex trade-offs between the conflicting objectives of different segments of the public for emergency ambulance service. The location of ambulance stations was planned so well that overall average system response times were improved while various segments of the community were assured that their needs were met, and millions of dollars will be saved per year.

The methods used in the finalist projects were as diverse as the problems

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0092-2102/85/1501/0001\$01.25

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solved. In the Netherlands project, many man-years of effort and over 40 separate models were employed. The complex interrelation of these models is too much to convey fully in the space available here — but they run the gamut of MS/OR techniques: LP, geometric programming, regression, simulation, and so forth. The Blue Bell project also employed a number of distinct models, some created expressly for this application. On the other hand, in both the Air Force cargo loading and Monsanto process optimization problems, the methods used are essentially standard, off-the-shelf models that MS/OR professionals will immediately recognize. Indeed, the impacts obtained are all the more remarkable for the simplicity of the analysis. Classic methods of MS/OR reappear over and over in these pages, to be sure sometimes altered: the cutting stock problem; the knapsack problem; regression analysis; simulation; set covering; and even that old standby, the EOQ model. But, the ingenuity with which these techniques are adapted and merged with others is often novel and refreshing. These papers are wonderful testimony to the creativity of practicing management scientists.

The contrasts between the projects are fascinating. We have one project that involved tens of persons over several years and must have used uncounted hours of mainframe computing (Netherlands) and another project that involved two persons over several months and used only a simple microcomputer (Air Force). We have several projects where the major impacts are financial, another where the impact is a contribution to military effectiveness,

and still another where improved emergency medical response was the main goal. Some used off-the-shelf models; others developed new approaches.

The interfaces between theory and practice, between the computer systems and MS/OR models, between industry and academia are evident throughout these pages. We at *Interfaces* are pleased to bring you this special issue. The efforts of many persons are gratefully acknowledged. David Dannenbring, Henri Groenevelt, Awi Federgruen, Richard Steinberg, Paul Zipkin, Arthur Swersey, Marshall Fisher, and Donald Goldfarb graciously shared insights on various issues related to the several papers. Mary Haight's usual stellar job of editing is not less appreciated because it has been so reliable and consistent from year to year. Last and not least, the authors deserve our appreciation. They have gone to great lengths — after the prize competition was over and their own work had moved on to other projects and problems — to bring to the MS/OR community informative and interesting descriptions of their work. Thanks.

Peter J. Kolesar
Editor

Prize Competition Special Issue

As editor-in-chief, I usually get the last word (unless my managing editor decides to delete it). Let me add my thanks to the individuals Peter Kolesar has mentioned and add my special appreciation for the excellent job Peter has done again with the Achievement Award papers.

Gary L. Lilien