



President's Desk

INFORMS President
Mark Daskin
m-daskin@northwestern.edu

About 15 years ago, I was at a consulting client delivering the final code for a project that a colleague and I had prepared. The project involved assigning busses to garages to minimize deadheading time between the garages and the starting and ending points of the routes while respecting garage capacities as well as other complicated side constraints. During the discussion, I mentioned that the software could take quite a bit of time to solve the problem. When they asked what that meant, I said it could take up to 15 minutes to get a solution. They laughed and said, "That's no problem." It was then that I realized that our (perhaps mostly academic) collective obsession with solution times was not shared universally by those in practice.

In fact, I suspect that there is a significant difference between the top three criteria that we consider for publication of papers in many of our journals (*Interfaces* being the most obvious, though not only, exception) and the top three questions that senior managers ask of our work.

For those of us who are active in the publishing arena, three questions seem to be paramount. First, is the formulation of the problem clever? Second, is it hard to solve; ideally, is it NP-hard? Third, what are the computation times of the algorithm? I admit to an optimization bias in posing these questions, but they can readily be translated to many, though not all, other branches of our discipline. As such, papers that solve a practical problem using known approaches often find a less-than-receptive home in our journals. I have read and refereed all too many papers that begin with a description of an interesting problem, formulate it nicely and then fall into the trap of reporting computational results only in terms of gaps between lower and upper bounds, and solution times. The papers fail to return to the original motivating problem to discuss how the model contributes to our understanding of that problem. Even in today's world of grade inflation, I would give such papers a B- at best.

Top Three Questions

While I have never served as a senior manager in industry, I doubt that these are the top three questions that a vice president of a Fortune 500 company will ask when considering

the use of O.R. to solve a problem. We will probably have to wait a long time before she asks how large the gap is between the lower and upper bounds. In fact, she already has an "upper bound" on any cost minimization problem: she is doing it! The first question she is likely to ask is, "Do you understand my problem?" If not, she is not going to be interested in our work. Second, she will ask, "How much better is your solution than the way I am doing business now?" If the savings are not significant, she will rapidly lose interest in our work. Finally, a senior manager will want to know, "How much will it cost to implement the model and the changes it recommends?" She will be considering the costs very broadly, including data acquisition costs (a model that requires data that are not available is not very useful), disruption costs and organizational change costs, and not simply in terms of the readily quantifiable costs that may be represented in our models.

Closing the gap between these divergent views of our work is critical to our profession. Several steps are possible. First, individual papers dealing with or motivated by applied problems should discuss how the model results relate to the problem! Low computation times and small duality gaps with randomly generated data should not be considered sufficient for publication. Brenda Dietrich, our president-elect and a director at IBM, asserts that there are really only two kinds of solution times: "fast enough" and "too slow." She is absolutely right. In any given problem context, either the model can be solved quickly enough to be useful or it cannot. Second, at the journal level, we should adopt mission statements that more aggressively promote the publication of papers relevant to practice. *Management Science* has done this by insisting that all papers provide some managerial insight. Other journals might promote more practice-oriented papers by creating new departments or areas. Third, the Science of Better Web site should be broadened to highlight papers beyond those that are finalists in the Edelman competition. We publish about 600 papers each year in our 11 print journals. While the concerns above apply to many papers, there are also numerous others that incorporate valuable practical insights and contributions. We can and should do a better job of communicating the exciting and useful results that are sometimes buried in these papers.

The abstract of a presentation at the recent EURO XXI 2006 conference began, "OR/MS is all about modeling..." **We need to change the paradigm from that of solving models to that of solving problems.** Society faces myriad challenges from healthcare reform and practice to educational policy, from criminal justice to the deterioration of our physical environment. Those of us with O.R. training are uniquely positioned to help analyze and resolve these problems. Let's get beyond computation times and start addressing the truly important problems we face.

I welcome your comments and invite those with opposing views to submit letters to the editor of *OR/MS Today*. A healthy debate about this topic will only strengthen our profession.