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Introduction: The Daniel H. Wagner Prize for Excellence in Operations Research Practice

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Key words: professional: comments on.

C PMS, The Practice Section of INFORMS, strives to support OR/MS practitioners by publicizing OR/MS success stories and connecting professionals with similar interests. We are therefore pleased to present the results of the seventh competition for the Daniel H. Wagner Prize for Excellence in Operations Research Practice, established in memory of the late Dr. Daniel H. Wagner.

Dan Wagner earned his PhD in mathematics from Brown University in 1951. His dissertation, "On free products of groups," was published in *Transactions of the American Mathematical Society* in 1957. He joined the US Navy's Operations Evaluation Group (OEG) and worked on operations research for naval warfare until 1956. After a one-year leave of absence for postdoctoral research at MIT, he joined Burroughs Research Center. There he directed a group of mathematicians who were performing analysis for the development of digital computers.

In 1957, Dan Wagner and John D. Kettelle formed the partnership of Kettelle and Wagner. In 1963, they dissolved the partnership and Dan formed a new company, Daniel H. Wagner Associates, Inc. This company did leading edge work in the mathematics of naval tactics, especially antisubmarine warfare, detection theory, and search planning.

During his years as president and principal owner of Wagner Associates, Dan brought many high-quality mathematicians into the operations research community. This led to significant advances in the firm's fields of endeavor and delivery of significant applications to Navy, Coast Guard, and other clients; many of these applications are still in service today.

After retirement from the firm, Dan held various teaching and research positions with the US Naval Postgraduate School and the US Naval Academy. He was a member of ORSA for more than 40 years.

In April 1997, as many of his former colleagues gathered at Dan's memorial service, the idea for this prize began. Following the agreements they made on that day and their subsequent pledges, the firms Metron, Inc., Daniel H. Wagner Associates, Inc., and Applied Mathematics, Inc. generously donated a total of \$51,000 as an endowment to ensure the availability of a cash award in perpetuity. This has grown to over \$72,000 within the INFORMS investment portfolio, even after seven cash awards. I am grateful to the chief executives of these companies for their financial support. Each of these companies is an outgrowth in large part of Dan's early efforts.

Metron, Inc. (President and Chairman of the Board Tom Corwin and CEO Larry Stone, www.metsci.com) is a scientific consulting firm with expertise in the areas of physical modeling, probability theory, operations research, and software development. Metron tackles challenging problems in the development of high technology systems for defense, air-traffic management, financial, and commercial applications.

Daniel H. Wagner Associates, Inc. (President Barry Belkin, www.wagner.com) specializes in innovative mathematical solutions to government and business problems. The firm provides consulting services in operations research, mathematics, and related software development. It also offers a variety of off-the-shelf products for financial analysis.

Applied Mathematics, Inc. (President Bill Browning, www.applmath.com) develops and implements

mathematical models that are used for real-time decision making. Current application areas include submarine, search and rescue, industrial control, and pharmaceutical systems.

I am grateful to the judges who donated their time to evaluate the entries and select the winners of this year's competition: Allen Butler, director of operations, D. H. Wagner Associates Hampton, Virginia office; Chuck Beall, past president of the INFORMS Roundtable; Peter Bell, University of Western Ontario Richard Ivey School of Business; Bill Browning, president, Applied Mathematics, Inc.; Howard Finkelberg, past chairman, CPMS; Terry P. Harrison, former editor-in-chief, *Interfaces*; Randy Robinson, member, CPMS Council; and Lawrence Stone, CEO, Metron.

A screening committee selected semifinalists who were then invited to submit full papers. The judging committee selected five finalists on the basis of their abstracts and verification of success in practice. The committee judged the final papers and selected the winning entry based on the following criteria: quality and coherence of analysis and originality of mathematical solutions, quality and clarity of writing, utility or success of the work in one or more real-world practice applications, and a satisfactory oral presentation.

This year, we had very strong and competitive entries, and we hope this is a good omen for the future. We are very proud of the five finalists whose papers appear in this issue.

First-place winners for 2006 are Ravindra K. Ahuja, University of Florida, Gainesville, Krishna C. Jha, Innovative Scheduling, Inc., and Jian Liu, Norfolk Southern Corporation, for work entitled "Solving real-life railroad blocking problems." This work addressed the development and implementation of new and innovative solution methods for the railroad blocking problem, an important railroad planning problem. The blocking problem is a very large-scale, multicommodity, flow-network-design and routing problem with billions of decision variables. This work developed a novel, very large-scale neighborhood (VLSN) search algorithm that solves the problem to near optimality using one to two hours of computer time. Use of this algorithm has resulted in significant cost savings for several large US freight railroads. It has been the foundation for a new and hopefully successful OR products company.

Runners-up included the team of John M. Bossert, Optiant, and Sean P. Willems, Boston University. They presented "A periodic-review modeling approach for guaranteed service supply chains." This work extended the guaranteed-service, supply chain modeling framework to allow for an arbitrary, integer review period or ordering frequency at each stage. The approach accommodates three different periodic-review operating policies: constant base-stock, constant safety-stock, and adaptive base-stock. The authors applied the model to real-world data and show that inventory metrics of the new model differ by more than 30 percent from those derived through the simpler modeling approach of aggregating a review period into lead time.

Jerome W. O'Neal, Michael S. Jacob, Adam K. Farmer, and Kristi G. Martin of Delta Technology Inc., presented "Development of a codeshare flight-profitability system at Delta Air Lines." This work was on the development and implementation of innovative approaches to a unique airline cooperative-marketing technique called "codesharing." Airlines form alliances to expand the network of markets each carrier can serve. Codesharing allows a carrier to place its marketing code on an alliance partner's flights. Codeshare flights can then be sold by a carrier even though they are operated by an alliance partner. Alliances can improve the revenue streams of their members; however, the amount of revenue increase depends significantly on which flights are chosen for codeshare. The authors developed a codeshare flight-profitability system that automates the codeshare selection process by choosing a set of codeshare flights that maximize total system revenue for a carrier while satisfying the rules that have been set by the alliance, the government, and the airlines' unions.

Markus Emsermann of Jeppesen, and Burton Simon of the University of Colorado at Denver, presented "Optimal control of an inventory with simultaneous obsolescence." This work involved the development and implementation of innovative methods for determining the optimal ordering and reordering policy for an inventory where the entire stock will simultaneously become obsolete at some (typically random) future time. Many businesses face the challenge of maintaining inventories that suddenly become obsolete. These circumstances render traditional inventory analysis unsuitable for balancing reordering costs

with the costs of overstocking. The authors constructed a mathematical model of an inventory with simultaneous obsolescence and a new method for determining its optimal control policy.

John Khawam and Warren H. Hausman of Stanford University, and Dinah W. Cheng of Hitachi Global Storage Technologies, Inc., presented “Warranty inventory optimization for Hitachi Global Storage Technologies, Inc.” This paper describes the development and implementation of innovative warranty inventory management solutions. Warranty inventory must cope with random replacement demands and multiple sources of resupply with differing lead times: no defect found (NDF), remanufacturing of returned units, and purchase of new product. By modeling NDF and remanufacturing as negative demand, the authors created a heuristic order-up-to inventory model for this setting and used the model to show the payoffs

derived from reducing lead times and reducing batching in remanufacturing.

I congratulate all the authors for outstanding work and again thank the loyal judges for their continuing volunteer efforts that make this competition possible. Please enjoy reading these fine papers.

Unfortunately, too few abstracts were submitted this year. Therefore, we will not have a competition at the 2007 INFORMS annual meeting in Seattle. Hopefully, we will obtain better publicity for the prize and have a successful competition in 2008.

This was my last year chairing this prize (for the time being) because I will be taking on new responsibilities for a major project. Allen Butler, my colleague, faithful judge, and good friend, has volunteered to take the responsibility, and I am sure he will do a bang-up job.

Send in those abstracts next year!