



Operations Research

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From the Editor

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From the Editor

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Subject classifications: OR/MS history; editorial comments.

The introduction of a new editorial board is a unique opportunity to evaluate the reputation, stature, and health of the journal. It is also an opportunity to examine its mission, scope, and coverage areas, the types of papers submitted and published, as well as the level of satisfaction of authors and readers. Indeed, this is the time to identify what works well, what needs to be improved, and what requires significant change in direction and emphasis. Similarly, it is an opportunity to reflect on changes in the profession and society that should influence the journal. This is exactly the objective of my editorial.

To help in this process, I reviewed the results of a Web-based survey of subscribers to *Operations Research* conducted by INFORMS, and I complemented this data with interviews and discussions with numerous people in academia and industry. The message I received is consistent and unambiguous: *Operations Research* is, and has been for over 50 years, the flagship journal of the profession. The journal has an excellent reputation for publishing high quality papers and, together with *Management Science*, has served as the primary outlet for scientific research in the field of operations research.

Nevertheless, important challenges exist. In the early days of the field, the focus was mostly on the development of quantitative methods to solve operational and managerial problems. More recently, the field has matured and while new or more effective methods are still of interest, the emphasis of current research has shifted toward solving more relevant problems. This shift entails expanding the scope and coverage of the journal so that it reflects and possibly influences the evolution of the profession.

At the same time, we have seen the proliferation of scientific journals focused on quantitative models and methods in various, often more specialized, operations and management areas. Many of these journals have been introduced by INFORMS in the last three decades: they include *INFORMS Journal on Computing, Manufacturing & Service Operations Management, Mathematics of Operations Research, Marketing Science*, and *Transportation Science*. Other operations research journals, such as *Mathematical Programming, Operations Research Letters, Naval Research Logis-*

tics, and *Networks*, compete in a similar marketplace. While this proliferation creates opportunities for authors, it demands the clarification of the scope and mission of *Operations Research*, the flagship INFORMS journal.

Mission and Scope

The mission statement of the journal is

to serve the entire operations research community, including practitioners, researchers, educators, and students.

Thus, the scope of *Operations Research* must be broad enough to cover both methodology and applications yet restricted to high quality, truly insightful papers. This is clearly an important distinction between *Operations Research* and other more focused journals sponsored by INFORMS or its subdivisions. Indeed, with the exception of *Management Science*, all other journals published by INFORMS attract papers that are of interest to a specific community. This is not the case for *Operations Research* as it has always emphasized the publication of papers that are of interest to more than a small portion of the society.

Evidently, such a broad scope does not distinguish *Operations Research* from another important journal in the field, namely *Management Science*. However, in the last few years, *Management Science* has emphasized “research motivated by strategic issues” as well as research important to a practicing manager.

By contrast, I believe *Operations Research* should attract and publish papers focusing on the **Science and Engineering of Operations**. Specifically, the **Science of Operations** refers not only to contribution to theory and the development of new methods, but also to analytical frameworks, quantitative relationships, and mathematical models, some of which may provide only insights into various problems not necessarily specific numerical solutions. Two good examples in this category include the celebrated Little’s Law from queueing theory, and the more recent literature on supply contracts illustrating the impact of risk sharing between suppliers and buyers.

By the same token, the **Engineering of Operations** focuses on solving specific operational problems and hence

requires real data and demands the development of computationally tractable algorithms. Examples here include algorithms for the design of telecommunications networks or for the design and operations of supply chains. In this case, the emphasis is on a new solution methodology that is practical and effective in solving real-world problems.

The implications of the previous statements are clear. I would like to see *Operations Research* attracting and publishing *high quality managerial or technical papers* that are based on rigorous mathematical models. Such papers should *demonstrate potential impact on practice*. Thus, the journal is interested in papers that focus on one or more of the following dimensions:

- Define new problem domains for the field;
- Introduce innovative concepts and mathematical formulations of problems;
- Provide new insights into operational problems;
- Develop new methodologies to approach known and new problems;
- Apply operations research methods in creative ways to interesting application areas.

At the same time, the journal is looking for papers that are of interest to the entire community. These include:

- Survey papers that summarize and update readers on the current state of the art of a major topic in operations research;
- Important historical surveys and overviews of the profession and its intellectual heritage; and
- Position papers suggesting new research directions for the profession or analyzing and critiquing current trends.

Areas of Coverage

The perception of the journal in the community obviously affects the type and breadth of papers submitted. At present, there seems to be some perception that *Operations Research* is too focused on technical contributions and that some areas of interest to the community are not covered by the journal.

My objective, therefore, is to **broaden the journal** content, and consequently the field, by publishing material that covers the entire spectrum of problems of interest to the community and by identifying new and emerging areas. In fact, Larry Wein, the former editor-in-chief, started this process by introducing the area of Financial Engineering.

The new editorial board will continue in that direction by introducing two new areas, **Revenue Management** and **Marketing Science**. Both areas have a long tradition in the field and use rigorous mathematical models to improve decision making. It is true that even without the existence of these two areas, papers in revenue management and marketing science have been submitted and published in the journal. However, by providing these two areas with a more visible place on the editorial board, and by selecting first-class researchers to lead the areas, the journal will encourage more submissions in these domains.

The second initiative is to reposition and broaden some of the existing areas of the journal. For example, OR Chronicle is now replaced by **OR Forum**, an area long abandoned by the journal. Reintroducing the OR Forum will allow the journal to expand its horizon and attract not only historical essays, but also thoughtful and substantive position papers that may suggest new research directions for the profession or reflect on current trends. With the introduction of the Web-based discussion forum, see below, I envision a lively and important interaction between the journal's readers reflecting on various points of views.

Similarly, the board is expanding the Military area so that it also covers the growing literature that applies operations research techniques to homeland security. This is, of course reflected by the area title, **Military and Homeland Security**. Thus, while the area is still interested in papers that address classical military problems as well as current defense issues, it encourages authors to submit papers focusing on the war on terror or on large-scale disasters such as earthquakes and hurricanes.

Finally, the board is repositioning the area of Computing and Decision Technology that for many years served as an interface with the computer science community. The area, now titled **Computing and Information Technologies** is to encompass research of a computational nature that lies at the boundaries between operations research and fields not obviously covered by the journal's other areas. Thus, the area is not only interested in advances in computational approaches for solving complex problems and associated decision support interfaces, but also in the application of operations research approaches and techniques to computational biology, information system design, learning theories, nanotechnology, and complex systems analysis.

To summarize, the journal now has the following 16 areas:

- Computing and Information Technologies
- Decision Analysis
- Environment, Energy, and Natural Resources
- Financial Engineering
- Manufacturing, Service, and Supply Chain Operations
- Marketing Science
- Military and Homeland Security
- Optimization
- OR Forum
- OR Practice
- Policy Modeling and Public Sector OR
- Revenue Management
- Simulation
- Stochastic Models
- Telecommunications and Networking
- Transportation

Taken together, these areas span the entire spectrum of research in our community. They build on areas where the journal has already had significant strengths such as Decision Analysis, Optimization, Stochastic Models, and Man-

ufacturing, Service, and Supply Chain Operations. At the same time, they are designed to stimulate research and submissions in emerging areas such as Financial Engineering, Revenue Management, and the application of operations research to other sciences, through Computing and Information Technologies.

Encouragement of New Areas of Study

An important objective of the new editorial board is to encourage new areas of study. Specifically, the board believes the field and the journal have the opportunity to significantly impact new areas that have not traditionally been explored. Indeed, some of the areas that can attract the attention of academia, industry, and government and where the journal can play an important role include: data mining, operations in service firms and organizations, homeland security, risk management, and emerging technologies such as Radio Frequency IDentification (RFID). At the same time, new methodologies such as robust optimization and approximate dynamic programming, suggest creative ways of solving a variety of classical and new problems.

Of course, the challenge is to provide a vehicle that helps attract new research areas. For this purpose I am planning three activities:

(1) **Publish special issues and surveys** that will serve as a source for defining and highlighting the state of the art in emerging areas.

(2) **Invite experts from other fields to submit review articles** on the use of rigorous mathematical models in their respective domains. The objective is to expose the operations research community to nontraditional applications and thus stimulate our own research and broaden the field.

(3) **Develop a Web-based discussion forum** that will feature an important paper and facilitate comments from readers of the journal. The editor-in-chief will screen comments before they are published on the website. The new discussion forum is scheduled for release, together with the new journal website, at the beginning of the year.

The Editorial Board and Publication Criteria

The role of the area editors is to achieve the editorial mission in their corresponding areas and to serve as a Board whose objective is to move the journal and the field of operations research forward. I have sought for the editorial board a group of first-class researchers having significant practical experience. These are the people responsible for maintaining the high acceptance standards of the journal.

The high standards that *Operations Research* strives for need to be clearly articulated to the community. This will help eliminate false expectations, reduce pressure on the review process, and ultimately improve the experience that authors and readers have. For this purpose, the new Board

has identified the basic questions **that every paper in the journal should address**. These include:

- Is the problem important?
- Is the research interesting to a wide range of people in the field?
- Does the paper have the potential to make an impact on practice?

At the same time, like many other scientific journals, every paper should stand the test of questions such as

- Is the paper intellectually deep?
- Can the paper stand the test of time?
- Is the analysis correct and rigorous?
- Is the paper well written?

Of course, even with these criteria, there is significant room for interpretation. Hence, maintaining uniform standards across all areas, perhaps with the exception of OR Practice and OR Forum, will not be easy to achieve. Thus, the new Board has agreed to hold quarterly meetings to review the status of the journal and to identify new initiatives that the journal should take. In parallel, the board has agreed on quarterly updates to all associate editors so they are aware of the journal's status and standards. These updates will include information on submission rates to the various areas, rejection rates, and most importantly, the review cycle times. The data will allow area editors and associate editors to measure their performance against the review cycle times of others.

Finally, I am complementing the editorial board with a new **Advisory Board** whose objective is to discuss major issues important to the journal, for example, new areas of coverage or the impact of the Internet on the journal. I am pleased to report that the following distinguished members of the community have accepted my invitation to serve on the board: Patrick T. Harker, Hau L. Lee, Thomas L. Magnanti, George L. Nemhauser, William P. Pierskalla, H. Donald Ratliff, and Ward Whitt.

Identifying Big-Impact Papers

An important challenge faced by the editorial board is to encourage and identify big-idea, big-impact articles. These are the papers that motivate new lines of research and are extended or built upon by others. Typically, these are highly cited papers, but often their importance and impact are recognized only a few years after publication.

Evidently the review of submitted papers is subjective, and its quality depends on the referees, the associate editors, and the editorial board. Unfortunately, rejecting papers on purely technical ground is straightforward and is considered a sign of high standards, while identifying big-impact papers is very difficult. My objective is to ensure that in our efforts to maintain and increase the quality of the journal, *Operations Research* will not lose opportunities to publish papers that make a difference. To help identify and publish these papers, I am offering the following guidelines:

- **Authors** should recognize that well-written, concise papers that *clearly identify the contribution of the research* will be easier for the editorial board to review. This has the added benefit of shortening the review process and allowing other authors to cite the published paper much sooner.

- The **editorial board** should *take risks when necessary and be flexible when appropriate*. That is, I prefer that the editorial board will identify, encourage, and help papers that have potential to make a big impact on the field rather than reject papers prematurely. This implies that the role of the editorial board is not only to control the process, but most importantly, to look for papers that make important contributions to the science and engineering of operations.

Reducing and Managing Delays and Backlog

One important concern of many authors is the review cycle time and the backlog of accepted papers. I strongly believe that shortening the review process is possible but requires the editorial board to closely monitor this process and recognize the work of exceptional associate editors and referees. It also requires penalizing consistently delinquent referees and associate editors.

The stated objective of *Operations Research* is to **complete the review process within four months**. The area editor can, however, make exceptions to this four-month cycle time for papers that he or she deems too long or complex. Such papers may require more time for careful reviewing. Thus, our goal is not rapid turnaround, which can always be achieved with short and uninformative reviews. Rather, the goal of *Operations Research* is to provide authors with high-quality reviews of their papers in a timely fashion.

To achieve this goal, we plan to use **Manuscript Central** for online submission and peer review. My experience with this system, which *Operations Research* launched recently, is that it will help to significantly increase the number of submitted papers and significantly decrease the review cycle time. Indeed, Manuscript Central will help the area editors and the editor-in-chief track the review process, alert the associate editor and the area editor when a paper has been with a referee for a long time, and supply various statistics to the editorial board.

In parallel, *Operations Research* is going to **limit the number of published pages**. Anything beyond the page limit will be published online. Thus, while there will be no limit on the length of a submitted paper, there will be a limit on the number of pages published in the printed version. This limit, not including graphs and tables, is of 30 pages in length, double-spaced with one-inch margins on all four sides of the page and with text in 11-point font. If a paper is accepted, *all submitted material beyond this limit will be published in the online supplement of the journal*. This initiative is designed to force authors to focus on shorter, concise, and well-written articles that appear in print. Such articles are easier to review, which helps reduce the review cycle time. Similarly, this limit will help reduce the publication backlog.

The length of the publication backlog is an important concern. On one hand, having a healthy backlog guarantees a smooth production and publication process. On the other hand, when the backlog is too long, and currently it takes 12 months from acceptance to publication, it may deter authors from submitting papers. In addition, the combined delay associated with the review process and the publication backlog, while not acceptable in general, is not appropriate in particular for topics such as energy, policy modeling, or homeland security. INFORMS has agreed to increase the page count of the journal by 20% in the next two years, which will hopefully reduce the publication backlog to six months.

Final Words

Operations Research has been the flagship journal of the profession for over 50 years. It has an outstanding reputation due to the work of many people but in particular former editors-in-chief, George L. Nemhauser, William P. Pierskalla, Thomas L. Magnanti, H. Donald Ratliff, Patrick T. Harker, and Lawrence M. Wein. I am honored to follow in their footsteps and build on what has already been achieved through hard work and commitment to the journal. The initiatives described in this document are meant to build on their success and help make the journal an even better outlet for authors and a more exciting place for readers.