



## Management Science

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### From the Editor

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## From the Editor

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With global supply chain problems in full swing, threatening economic recovery, the management science community is in an important position to play a role in the recovery process. Indeed, new research opportunities have emerged in the last two years, from supply chain resiliency to sustainability, from COVID-19 testing to healthcare delivery, and from reassessing decade-old business models to the digitization of an entire business. In such an environment, our ability to apply data and analytics to improve the understanding of managerial challenges can have an enormous impact.

In response to these developments, we have seen a dramatic increase in submission volume across all the journal's departments. Similarly, referees, associate editors, and the editorial board provided timely responses and substantive evaluations, despite the pandemic challenges. I am proud of all that we have achieved collectively during these difficult times and would like to reflect in this editorial on the state and stature of the journal.

### 1. Statistics and Analysis

The following is my review and analysis of the various *Management Science* statistics.

#### 1.1. Submission Volume

The number of new submissions in 2021, including both regular and Fast Track papers, is projected to cross the 4,300-submission line and is estimated to be 4,323, which is about 12% higher than 2020. See Figure 1.

A few observations are worth noting:

- The significant increase in submission volume in 2021 relative to 2020 (when comparing Q1–Q3 of both years, and when comparing actual 2020 submissions to 2021 projection) is driven by a significant increase in submissions to the Business Strategy (38%), Behavioral Economics and Decision Analysis (17%),

Finance (10%), Healthcare Management (11%), Optimization (31%), and Revenue Management and Market Analytics (23%) departments.

- When reviewing the submission volume of the Operations Management Department, the community should recognize that the introduction of the three new departments—Data Science, Healthcare Management, and Revenue Management and Market Analytics—cannibalizes submission volume of papers that in the past would have been submitted mostly to Operations Management. Looking at the data from this point of view, one observes that the total number of submissions across the four departments (Operations Management plus the three new departments) represents about 15% of the total submission volume to *Management Science*. Equally important, the volume of submission to the four departments increased by 30% between 2018 and 2021.

- The volume of submission for Fast Track papers, projected to be about 460 in 2021, indicates the community's strong interest in the new submission process.

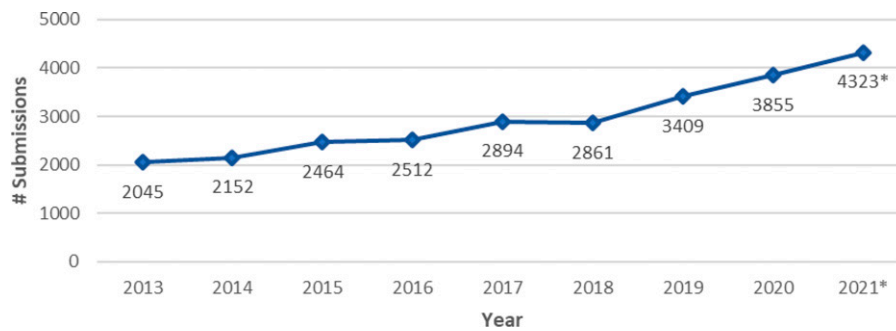
#### 1.2. Review Cycle Time

*Management Science* continues to maintain an outstanding cycle time. The data suggest that in the first three quarters of 2021, the average time to first decision was about 65 days for regular papers and 30 days for Fast Track submissions.

Equally important, review times to final decision have been dramatically decreasing. Whereas the median was 155 days in 2018, it is currently 90 days.

#### 1.3. Acceptance Rate

*Management Science's* acceptance rate this year across all submissions (regular and Fast Track) is about 10.5%, which is similar to the acceptance rate of the last few years. This acceptance rate is not uniform across all departments. For example, the large submission volume enjoyed by the Finance Department allows the board to raise the publication bar and reduce its acceptance rate,

**Figure 1.** Original Submissions—Regular and Fast Track Papers

Note. The asterisk indicates that data for 2021 represent projection based on regular and Fast Track papers submitted between January 1, 2021, and September 30, 2021.

which is now at 9.0%. This is still above the acceptance rate of some of the leading finance journals. Indeed, being a flagship journal of INFORMS implies that *Management Science* is, or should be, the most important outlet for papers in a specific field. This was a concern expressed in my editorial statement at the beginning of 2018 (see Simchi-Levi 2018), and the cap on the acceptance rate should help the department penetrate the top-tier finance journals.

In addition, the bar is significantly higher for Fast Track papers. As a result, the acceptance rate for this submission process is about 6.6%, significantly lower than that of regular papers.

#### 1.4. Ranking and Impact Factor

*Management Science* has been and continues to be one of the most prestigious journals in the field. The journal impact factor has moved in the right direction. The two-year impact factor increased from 3.935 in 2019 to 4.883 in 2020. Unfortunately, comparing 2020 data to 2019 isn't straightforward, given that beginning this year, Web of Science bases its calculation on the online publication date rather than the print publication date.

Recently, Google Scholar released its 2021 Scholar Metrics. According to Google Scholar, *Management Science* has an h5-index of 103 and an h5-median of 145. These two metrics count the citations for papers published in the last five complete calendar years. To put this in perspective, Table 1 provides the metrics for all 24 journals on the University of Texas at Dallas (UTD) Naveen Jindal School of Management's list of journals. As you can see, *Management Science* is ranked high on this list.

## 2. Update on Major Initiatives

Next is a report on some of the major initiatives introduced by the journal.

### 2.1. Data and Code Disclosure Policy

In order to ensure the availability of the material necessary to replicate the research published in the journal, *Management Science* introduced a Data and Code

Disclosure Policy (<https://pubsonline.informs.org/page/mnsc/datapolicy>) in 2019 (see Simchi-Levi 2019, 2020) and appointed a data editor in early 2020.

The data editor, Ben Greiner, and his team (Miloš Fišar and Ali Ozkes) started reviewing replication packages in April 2020. Their responsibility is to ensure that accepted papers comply with the Data and Code Disclosure Policy so that results published by the journal can be replicated.

The code and data review process aims to ensure that all code and data are provided to allow replication of all tables, figures, and other major results in the main manuscript of the article. Exceptions may apply with approval of the department editor, particularly for proprietary or confidential data.

There is currently no capacity to compare the results produced in the replication to the results reported in the paper; this is left to the academic community.

From April 2020 to November 2021, the data editorial team reviewed the replication materials of 231 accepted articles, with the number of affected articles increasing over time (because only articles submitted after June 1, 2019, fall under the policy).

**2.1.1. Statistics About Reviewed Papers.** The distribution of reviewed papers across departments reflects the relative size and data/code intensity in these departments; see Figure 2. In terms of methodology, Figure 3 shows that more than half of all papers in data/code review are papers working with empirical data sets (often obtained from commercial providers but partly also self-collected). About a fifth of the papers report results from laboratory, online, or field experiments; 4% are based on surveys; and 22% of papers mainly feature theoretical models, simulations, or computations. These latter papers often only include code but no data, or they use data only for simulation/demonstration purposes.

When considering all papers that deal with data (i.e., excluding papers that are code-only), 42% of all eventual replication packages rely on proprietary data, 9% of the papers provide at least partial data,

**Table 1.** Google Scholar Metrics for Journals on the UTD List of Leading Business Journals

Journal	h5-index	h5-median
<i>Journal of Financial Economics</i>	116	189
<i>The Review of Financial Studies</i>	108	167
<b>Management Science</b>	<b>103</b>	<b>145</b>
<i>The Journal of Finance</i>	99	182
<i>Strategic Management Journal</i>	96	140
<i>Academy of Management Journal</i>	90	132
<i>Management Information Systems (MIS) Quarterly</i>	72	106
<i>The Accounting Review</i>	72	112
<i>Academy of Management Review</i>	66	119
<i>Journal of International Business Studies</i>	66	104
<i>Journal of Consumer Research</i>	64	102
<i>Journal of Accounting and Economics</i>	63	98
<i>Journal of Marketing</i>	63	120
<i>Journal of Marketing Research</i>	56	88
<i>Operations Research</i>	56	78
<i>Organization Science</i>	54	84
<i>Administrative Science Quarterly</i>	52	97
<i>Information Systems Research</i>	50	78
<i>Journal of Accounting Research</i>	50	107
<i>Marketing Science</i>	50	84
<i>Production and Operations Management</i>	50	70
<i>Journal of Operations Management</i>	47	74
<i>Manufacturing &amp; Service Operations Management</i>	47	70
<i>INFORMS Journal on Computing</i>	30	48

Notes. Bold has been added for emphasis. Google Scholar defines the h5-index as the largest number  $h$  such that at least  $h$  articles published in a five-year span have at least  $h$  citations each, and the h5-median is the median number of citations for the articles that make up its h5-index. The source of the data is the Google Scholar Metrics tool; see “Google Scholar Blog: 2021 Scholar Metrics Released” (<https://scholar.googleblog.com/2021/07/2021-scholar-metrics-released.html>); accessed August 9, 2021).

and 49% include all data necessary to replicate. Among those papers with proprietary data, 38% use data sets that are publicly accessible via subscription to services such as Wharton Research Data Services or Compustat. About 26% of papers with proprietary data provide at least sample or synthetic data sets that allow the code to be rerun without producing the exact same results as reported in the paper.

**2.1.2. Statistics About the Review Process.** For those accepted papers that fell under the code and data policy and thus underwent review, the data and code review stage took, on average, about 21 days. Of these, a paper spent about 11 days in review with the data editor and his team and about 10 days with authors for revisions to their replication materials.

Whenever possible, on the basis of the inclusion of all data (or synthetic or sample data sets) and the availability of software packages, the data editorial team also runs the code to check its validity. This was possible in 58% of all replication packages.

About 28% of submitted replication packages could be accepted without further revisions. About 54% of packages needed one revision, 16% went through two revisions, and the remainder took three rounds or more. Figure 4 lists a breakdown of different types of revision

requests to authors, separately for papers with data and code-only papers. The figure shows that most often, the data editor had to ask for better documentation of included data sets (e.g., variable dictionaries, instructions on data set construction) and better documentation of code or other information (e.g., descriptions where which figure and table is produced, log files for code that cannot be run). The data editor often also had to ask for (more) code to produce all figures and tables in the main manuscript. Errors in the submitted code are not uncommon (for papers with data, given that only 58% of codes can be checked, the 22% of code errors imply that bugs or other issues are found in more than a third of submitted codes).

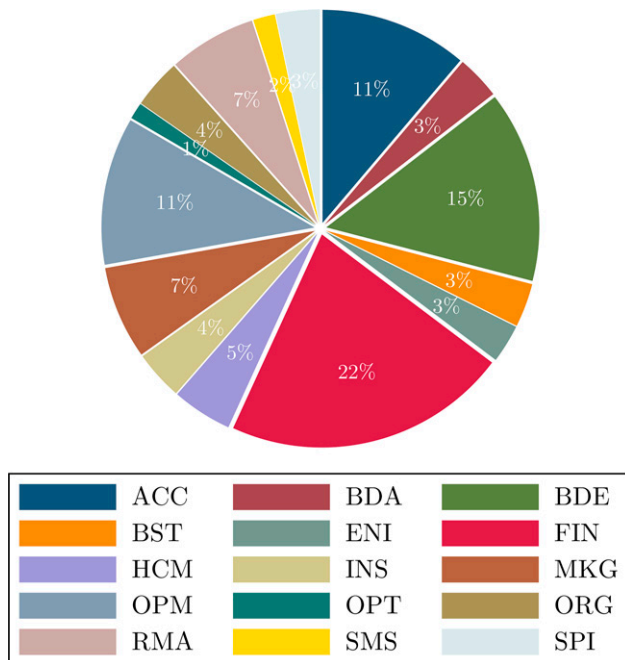
About 7% of data and code reviews required authors to make changes in their paper. Because the review does not include comparing code output to the paper, in all cases, the authors detected these necessary changes themselves when reviewing their replication package. In all cases, these changes were minor, and in all cases, the respective department editor was involved to confirm his or her acceptance decision in face of the changes.

**2.2. Replication Project**

In March 2020, the editorial board initiated a replicability project with the objective to report replicability of laboratory experiments published by *Management Science*.



**Figure 2.** Departments of Papers in Data and Code Review, April 2020–November 2021



Note. ACC, Accounting; BDA, Big Data Analytics; BDE, Behavioral Economics and Decision Analysis; BST, Business Strategy; ENI, Entrepreneurship and Innovation; FIN, Finance; HCM, Healthcare Management; INS, Information Systems; MKG, Marketing; OPM, Operations Management; OPT, Optimization; ORG, Organizations; RMA, Revenue Management and Market Analytics; SMS, Stochastic Models and Simulation; SPI, Special Issue.

I am pleased to report we now have a team of eight academics (with significant experience in behavioral operations) committed to addressing the replicability challenge. The team includes members from five institutes with established labs, which will allow us to conduct each replication in multiple locations. The faculty involved include **Andrew Davis**, Cornell University; **Blair Flicker**, University of South Carolina; **Kyle Hyndman** and **Elena Katok**, University of Texas at Dallas, **Samantha Keppler** and **Stephen Leider**, University of Michigan; and **Xiaoyang Long** and **Jordan Tong**, University of Wisconsin–Madison.

Last year, the team collected survey results from the community in which they asked participants to vote for the papers they would like to see replicated. The papers were in the following five areas: inventory management, supply chain (contracting), queueing, forecasting, and sourcing. The team chose the 2 papers with the highest number of votes from each category, for a total of 10 papers.

This year, the team obtained institutional review board approvals for each paper, developed a detailed replication plan for each paper (including specific hypotheses to be replicated, sample sizes, and treatments to be conducted), communicated with the authors of

the papers for feedback to make sure they agree with the replication plan, and obtained the software (either using the original software from the authors or building new software if the original was not available). The team also completed the asynchronous (online) data collection for those experiments that can be done online and started the data analysis.

Finally, the team developed a project website that allows the community to review information about the team, papers, processes and, later on, results from the replication project. See the MS Replication Project home page at <https://msreplication.utdallas.edu/>.

### 2.3. Special Issues

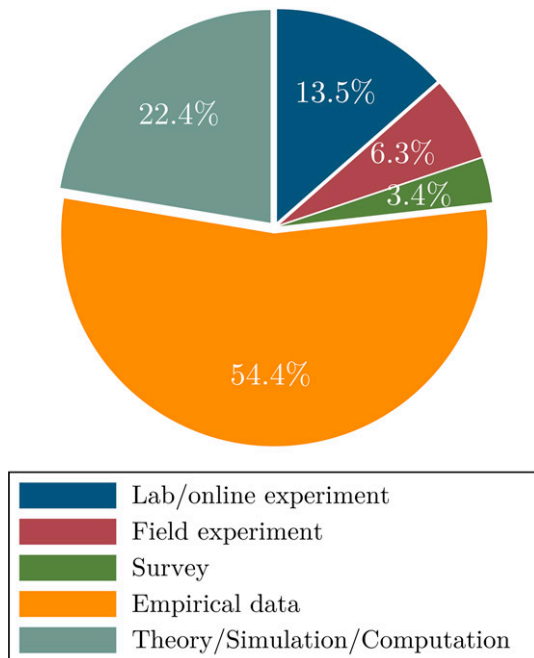
Evidently, management practice breaks boundaries between functional areas; therefore, it is essential for the research community to do so as well (see Simchi-Levi 2021). This type of research has increased modestly over the past decade (see Hopp and Simchi-Levi 2021).

To accelerate the process, the editorial board initiated a few special issues that bring together editors from different disciplines to collaborate on a specific topic. Here is an update on the various ongoing special issues.

**2.3.1. Finalizing the Special Issue on Data-Driven Prescriptive Analytics.** In 2018, *Management Science* introduced a special issue on Data-Driven Prescriptive Analytics. The special issue was focused on papers that leverage predictive and descriptive analytics to derive effective solutions for business problems. The special issue has attracted a significant number of submissions, in part, because it emphasizes interdisciplinary research that brings together disciplines such as finance, marketing, operations management, and data science. This special issue received 221 submissions and is due to appear in print in March 2022.

**2.3.2. Special Issue on Business and Climate Change.** Climate change poses major risks and opportunities for a wide array of companies and industries—and to society at large. This special issue seeks to spur research that provides critical insights to managers who need to adjust how they plan, measure, forecast, innovate, develop products and services, and manage supply chains in light of opportunities to mitigate climate change and adapt to climate change’s physical consequences and regulatory changes. Of course, “climate change” is a topic that needs to be studied from several different functional lenses, including accounting and finance, business strategy, entrepreneurship and innovation, operations, organizations, and, in particular, cross-disciplinary lenses. For these reasons, coeditors include senior people from the various disciplines covered by the journal. By the submission deadline (February 28, 2021), the journal received 244 papers.

**Figure 3.** Types of Papers in Data and Code Review, April 2020–November 2021



We hope to publish the special issue at the beginning of 2023.

**2.3.3. Special Issue on Blockchain and Crypto Economics.** The rise of blockchains and digital finance has led the management science community to rethink managerial decision making, the handling of supply chain processes, the storage and analysis of data, and the execution of financial transactions. Industry changes and challenges also call for new theory, mechanisms, and comprehensive empirical studies to inform the design of various systems and measure their impact on society, especially in research areas represented by *Management Science*, including

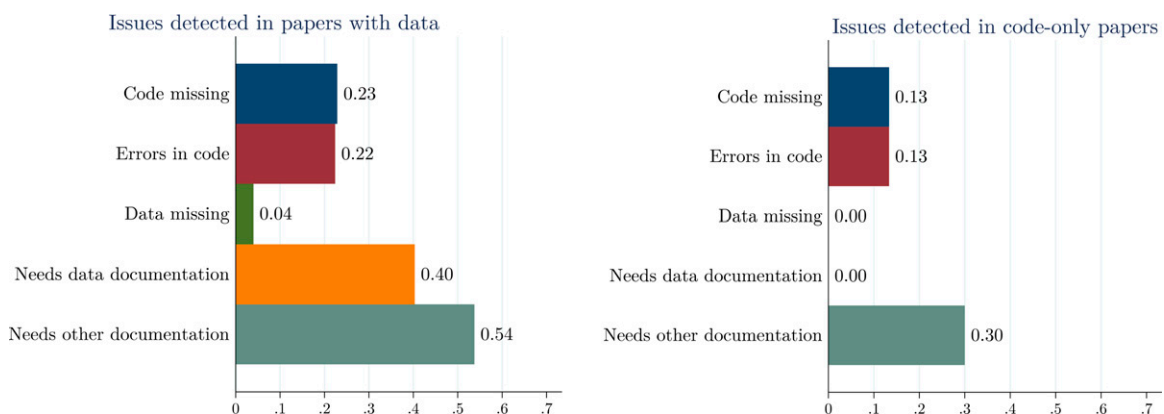
but not limited to accounting, finance, healthcare, operations, marketing, and stochastic systems. The special issue is done in collaboration with the Crypto and Blockchain Economics Research (CBER) Conference organized by Cornell University and the University of Toronto. The submission deadline was August 31, 2021. We received 108 papers for this special issue.

**2.3.4. New Special Issue on the Human-Algorithm Connection.** Algorithms have become ubiquitous. They permeate a variety of daily activities and shape production processes and the provision of services. The advent of big data and the widespread adoption of machine learning and analytics overall has catapulted the presence of algorithms to new levels. Innovative business models have been built around algorithms, and novel use cases have emerged that were unthinkable not long ago. There are no signs of this trend reversing—quite the opposite. It is more likely the preponderance and reliance on algorithms will accelerate in the upcoming years.

For all their importance, the use of algorithms creates a new set of challenges, in great part because they do not exist in a vacuum. Algorithms are developed and controlled by humans, and the output of algorithms directly and indirectly affects humans' decisions and actions. Moreover, algorithms are created within organizations with a purpose that should align with an organization's mission and strategy. Finally, at an aggregate level, algorithms can have an impact on society as a whole.

The special issue on the human-algorithm connection seeks to attract research that gives decision makers a better understanding of the coexistence of humans with algorithms and how to improve it. The work must have an important human component (i.e., purely focusing on algorithms won't suffice) and algorithms are to be understood in a broad sense, including machines and apps. Top-quality papers in any of the research areas

**Figure 4.** Revision Requests/Concerns for Papers in Data and Code Review, April 2020–November 2021



represented by *Management Science* are welcome, both theoretical and empirical. Interdisciplinary studies are also highly encouraged.

The special issue brings together many of the journal's departments and includes coeditors Felipe Caro (representing operations management), Jean-Edouard Colliard (finance), Elena Katok (operations management and behavioral operations), Axel Ockenfels (market design), Nicolas Stier-Moses (data science), Catherine Tucker (marketing), and D. J. Wu (information systems). The submission deadline is September 9, 2022.

### 3. Special Thanks

The initiatives described earlier would not have been possible without the hard work of many peo-

ple including the data editor and his team; the faculty involved in the replication project; the special issues' coeditors; and of course, authors, referees, associate editors, and the entire editorial board. I feel grateful to be surrounded by such a community, whose endless effort is making an impact on research and practice.

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