

No end of the world in 2012 for *4OR*

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Abstract The purpose of this note is to give the readers of *4OR* information on the state of the journal and its future, abiding by a triennial tradition which started with Bouyssou et al. (4OR 1(1):1–6, 2003) and continued with Bouyssou et al. (4OR 4(1):1–9, 2006) and Bouyssou et al. (4OR Q J Oper Res 7(1):15, 2009). In the 3 years that have passed since the last editorial note, three volumes of the journal have been published, each containing four issues: vol. 7 (2009), vol. 8 (2010) and vol. 9 (2011).

1 What has happened since 2008?

We briefly summarize here the main events in the life of the journal since the end of 2008.

- *4OR* is now regularly indexed in ISI Science Citation Index Expanded (SCIE). Its impact factors have been 0.75 (June 2009) and 0.69 (June 2010). Although these are good ratings for a young journal, they are considerably penalized by our policy of publishing PhD Thesis abstracts. Indeed they are counted by ISI as regular papers, but receive practically no citation because authors tend

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to cite the original thesis (even if unpublished). More correctly (in our opinion) Google Scholar credits such citations to the regularly published abstract. The difference can be dramatic: to make an example, the PhD Thesis by Monaci (2003) has no citation according to ISI, and 34 citations according to Scholar!

- On the one hand PhD Thesis abstracts penalize our impact factor, but on the other hand they are very appreciated by our readers, as shown by the high number of downloads. We contacted ISI, suggesting that they could be classified as sort of *Letters to the Editors*, but the answer was they have all characteristics of a regular paper: they are four pages long, are subdivided into sections, have an author's affiliation, an abstract and a bibliography. We thus decided to try a compromise: they are now limited to a single section of at most two pages, without author's affiliation, abstract and bibliography. With issue 4 of 2011 we have exhausted our backlog of "old style" abstracts (meaning that there will be no effect on the 2012 impact factor), while our hope is that the "new style" ones will not be counted by ISI (although they took no commitment in this sense).
- Since its birth *4OR* adopted an electronic handling of submissions, managing all exchanges between authors, editors-in-chief, area editors, referees and publisher through emails. Starting January 1st 2012, we switched to the Springer electronic submission system (<https://www.editorialmanager.com/forj/>). The system was adapted to our specific needs, and, so far, it looks quite efficient and user friendly.
- For the first 5 years we have followed a publishing pace of 4 issues of approximately 85 pages per year. Since the backlog of accepted papers was increasing, starting with vol. 6 in 2008, the size of the journal was increased to 100 pages per issue. Starting with vol. 8 in 2010, the size was further increased to 110 pages per issue, an increase of 30% with respect to the beginning.
- The quality of the Invited Surveys that were published in the first six volumes of the journal led to two volumes of the *Annals of Operations Research* republishing (updated versions) of these surveys (see Bouyssou et al. 2007, 2010a).
- During 2009, the journal was managed by Philippe Baptiste, Silvano Martello and Frank Plastria. In 2010, having served for 7 years, Frank Plastria retired as one of the principal editors of the journal and was replaced by Thierry Marchant (<http://users.ugent.be/~tmarchan/>). In the same year 2010 Philippe Baptiste was appointed as Director of the CNRS Institute for Information Science and Technology: in consideration of the heavy workload required by his new position, Philippe resigned as principal editor, and was replaced by Leo Liberti (<http://www.lix.polytechnique.fr/~liberti/>). We would like to warmly thank Frank Plastria and Philippe Baptiste for their invaluable contribution to the journal. They now joined Denis Bouyssou as Senior Editors of *4OR*.
- At the beginning of the triennium, a new board of Area Editors was appointed, to better reflect the fields of Operations Research in which we receive many

Table 1 Types of papers published (2009–2011)

Type of papers	Number of papers	Number of pages	Percentage of pages
Editorials	2	20	1.6
Invited surveys	11	328	25.7
Research papers	40	685	53.7
Industry papers	4	72	5.7
Education papers	1	18	1.4
PhD thesis abstracts	38	152	11.9
Total	96	1274	100.0

Plus 12 pages of acknowledgements and letters to Editors

submissions. We would like to welcome all Area Editors, and thank them for their effort towards the development of *4OR*.

2 What has been published?

In addition to editorials like the present one, the journal currently publishes papers in five different sections:

- invited surveys;
- research papers;
- abstracts of PhD thesis;
- industry papers;
- education papers.

All types of papers were indeed published in volumes 7–9. A synthetic view of what was published appears in Table 1. We detail below, for each of the sections of the journal, which papers were published and how they were selected.

3 Invited surveys

In volumes 7–9, we have published 11 invited surveys, one per issue (except for one issue [vol. 4(1)] in which the invited survey was replaced by editorial notes). The average length of these papers was 30 pages (compared to 32 in volumes 1–3 and 39 in volumes 4–6) with a minimum of 18 pages and a maximum of 48 pages. About one fourth of the journal is devoted to these texts. Whereas the room taken up by these surveys decreases the space left for research papers, our belief is that they are appreciated by the OR community (this is confirmed by a high number of downloads). Hence, they tend to be frequently referenced, therefore increasing the visibility of the journal, which should be beneficial to all authors in the long run.

Our policy is to publish surveys written by well-established scholars, presenting the state-of-the-art of relevant Operations Research areas. Papers in this section are solicited by one of the Editors-in-Chief, and are reviewed collectively by all of them. A further priority of ours is that the survey authors should come from a large variety

Table 2 Country of origin of invited surveys published (2009–2011)

Country	Number of surveys	Percentage
Italy	5	45.4
France	1	9.1
Denmark	1	9.1
Japan	1	9.1
Turkey	1	9.1
UK	1	9.1
USA	1	9.1
Total	11	100.0

of countries (see Table 2; we conventionally record the nationality of the majority of authors, using the country of origin of the first author to break ties). Four out of eleven surveys came from outside EU.

We detail in Sect. 3.1 how the *Annals of Operations Research* volume containing the ones in volumes 4–6 saw light. We detail in Sect. 3.2 the invited surveys that were published in volumes 7–9.

3.1 The *Annals of Operations Research* volumes

In 2006 Peter L. Hammer contacted the Editors-in-Chief of *4OR*, proposing to collect the surveys published in the first three volumes of the journal in a volume of the *Annals of Operations Research* series, in order to make them more widely available to the OR community. The volume, edited by Bouyssou et al. (2007) appeared in 2007. After Peter's tragic death, his successor, Endre Boros, proposed to continue the series with the surveys published in 2006–2008. The volume, titled *Surveys in Operations Research II (Invited Surveys from 4OR, 2006–2008)* (Bouyssou et al. 2010a) appeared in 2010. We very shortly describe here its contents, referring the reader to Bouyssou et al. (2010b) for a more detailed description.

1. *Some operations research methods for analyzing protein sequences and structures* [*4OR* 4/2, Błażewicz et al. (2006)]: Jacek Błażewicz, Piotr Łukasiak and Maciej Miłostan review Operations Research techniques that were relatively recently introduced in biology, especially in the protein analysis area, to support biologists.
2. *Integrating operations research in constraint programming* [*4OR* 4/3, Milano and Wallace (2006)]: Michela Milano and Mark Wallace describe how constraint programming, viewed as a natural formalism for modeling problems, allows linear programming to be combined with propagation and novel and varied search techniques.
3. *Ejection chain and filter-and-fan methods in combinatorial optimization* [*4OR* 4/4, Glover and Rego (2006)]: Fred Glover and César Rego present the general framework of the ejection chain and filter-and-fan methods, powerful neighborhood structures fundamental to the performance of local search and metaheuristic algorithms for combinatorial optimization.

4. *A survey on the linear ordering problem for weighted or unweighted tournaments* [4OR 5/1, [Charon and Hudry \(2007\)](#)]: Irène Charon and Olivier Hudry survey results, conjectures and open problems dealing with the combinatorial and algorithmic aspects of the linear ordering problem.
5. *Combinatorial optimization and green logistics* [4OR 5/2, [Sbihi and Eglese \(2007\)](#)]: Abdelkader Sbihi and Richard W. Eglese introduce the area of green logistics and describe the main topics in this field which can be formulated as combinatorial optimization problems.
6. *Generalized Nash equilibrium problems* [4OR 5/3, [Facchinei and Kanzow \(2007\)](#)]: Francisco Facchinei and Christian Kanzow discuss the main properties and solution algorithms for the generalized Nash equilibrium problem, an important model that has its roots in the economic sciences but is being fruitfully used in many different fields.
7. *Recent advances in vehicle routing exact algorithms* [4OR 5/4, [Baldacci et al. \(2007\)](#)]: Roberto Baldacci, Paolo Toth and Daniele Vigo review the most recent developments that had a major impact in the current state-of-the-art of exact algorithms for the capacitated vehicle routing problem.
8. *A decade of application of the Choquet and Sugeno integrals in multi-criteria decision aid* [4OR 6/1, [Grabisch and Labreuche \(2008\)](#)]: Michel Grabisch and Christophe Labreuche examine the main advances on the use of the Choquet and Sugeno integrals in multi-criteria decision aid over the last decade.
9. *On the use of graphs in discrete tomography* [4OR 6/2, [de Werra et al. \(2008\)](#)]: Dominique de Werra, Marie-Christine Costa, Christophe Picouleau and Bernard Ries present a tutorial paper on a graph theoretical model for the basic image reconstruction problem which stems from discrete tomography.
10. *Mathematical optimization in intensity modulated radiation therapy* [4OR 6/3, [Ehrgott et al. \(2008\)](#)]: Matthias Ehrgott, Çiğdem Güler, Horst W. Hamacher and Lizhen Shao survey optimization models, methods, and theories in mathematical optimization which were recently successfully introduced in the design of intensity modulated radiotherapy treatments.
11. *Variable neighborhood search: methods and applications* [4OR 6/4, [Hansen et al. \(2008\)](#)]: Pierre Hansen, Nenad Mladenović and José Moreno Pérez review the main aspects of variable neighborhood search metaheuristics, a framework based upon systematic changes of neighborhoods.

3.2 Invited surveys: 2009–2011

The following surveys were published in volumes 7–9.

1. *Constraint programming-based column generation* [4OR 7/2, [Gualandi and Malucelli \(2009\)](#)]: Stefano Gualandi and Federico Malucelli survey recent applications and advances of the constraint programming-based column generation framework, where the master subproblem is solved by traditional OR techniques, while the pricing subproblem is solved by constraint programming.

2. *The core of games on ordered structures and graphs* [4OR 7/3, [Grabisch \(2009\)](#)]: Michel Grabisch gives a unified view of the results that have been obtained by defining a game on a subcollection of the power set of the set of players, examining the implications on the mathematical structure of the core.
3. *Intra-domain traffic engineering with shortest path routing protocols* [4OR 7/4, [Altn et al. \(2009\)](#)]: Aysegül Altn, Bernard Fortz, Mikkel Thorup and Ümit Hakan review optimization techniques that have been developed for managing intra-domain routing in networks operated with shortest path routing protocols, and the state-of-the-art research that has been carried out in this direction.
4. *Extended formulations in combinatorial optimization* [4OR 8/1, [Conforti et al. \(2010\)](#)]: Michele Conforti, Gérard Cornuéjols and Giacomo Zambelli survey the size of perfect formulations for combinatorial optimization problems, with special emphasis on situations where the addition of a polynomial number of extra variables allows a formulation with a polynomial number of inequalities.
5. *Robust portfolio asset allocation and risk measures* [4OR 8/2, [Scutellá and Recchia \(2010\)](#)]: Maria Grazia Scutellà and Raffaella Recchia discuss the mathematical models, and related algorithmic approaches, that have recently been proposed to address uncertainty in portfolio asset allocation, focusing on robust optimization methodology.
6. *Recent progress of local search in handling the time window constraints of the vehicle routing problem* [4OR 8/3, [Hashimoto et al. \(2010\)](#)]: Hideki Hashimoto, Mutsunori Yagiura, Shinji Imahori and Toshihide Ibaraki review recent results on how to handle hard and soft time window constraints of the vehicle routing problem, putting emphasis on its different definitions and algorithms.
7. *Makespan minimization in online scheduling with machine eligibility* [4OR 8/4, [Lee et al. \(2010\)](#)]: Kangbok Lee, Joseph Y.-T. Leung and Michael L. Pinedo examine online scheduling problems in parallel machine environments with various types of machine eligibility constraints, and the makespan as objective function.
8. *Probabilistic decision graphs for optimization under uncertainty* [4OR 9/1, [Jensen and Nielsen \(2011\)](#)]: Finn Jensen and Thomas Nielsen survey probabilistic decision graphs for modeling and solving decision problems under uncertainty, providing an introduction to influence diagrams and to alternative representation languages.
9. *Airport runway scheduling* [4OR 9/2, [Bennell et al. \(2011\)](#)]: Julia Bennell, Mohammad Mesgarpour and Chris Potts review the main solution techniques (dynamic programming, branch and bound, heuristics and meta-heuristics) that are used for scheduling aircraft landings and take-offs.
10. *Political districting: from classical models to recent approaches* [4OR 9/3, [Ricca et al. \(2011\)](#)]: Federica Ricca, Andrea Scozzari and Bruno Simeone introduce and discuss selected optimization models and algorithms for political district-

Table 3 Origin of research papers (excluding book reviews) published (2009–2011)

Country	Number of papers	Percentage
France	8	20.0
Belgium	6	15.0
Italy	4	10.0
Germany	3	7.5
Taiwan	3	7.5
Iran	2	5.0
Portugal	2	5.0
Tunisia	2	5.0
USA	2	5.0
Australia	1	2.5
Austria	1	2.5
Canada	1	2.5
China	1	2.5
India	1	2.5
Netherlands	1	2.5
Spain	1	2.5
UK	1	2.5
Total	40	100.0

ing, which gave rise to the main lines of research on this topic in the Operations Research literature of the last five decades.

11. *Mixed integer nonlinear programming tools: a practical overview* [*4OR* 9/4, [D'Ambrosio and Lodi \(2011\)](#)]: Claudia D'Ambrosio and Andrea Lodi review available tools for solving mixed integer nonlinear programming problems, with the aim of giving the reader a flavor of the difficulties one can face in this field.

4 Research papers

4.1 Research papers published

Regular papers are the core of the journal. We published 40 such papers in volumes 7–9, giving an average number of 3.33 research papers per issue. For volumes 1–6, we had an average of 2.5. Table 3 details the country of origin of the papers published (using the same convention as above). Belgium, France and Italy account for 45% of all papers.

The average length of the research papers published in volumes 7–9 is 16.5 pages with a minimum of 6 pages and a maximum of 34 pages. This is detailed in Table 4. Around half the papers published are under 15 pages. This seems in line with our policy of favoring the publication of short papers, although we do not have a strict rule concerning the maximum length of a research paper.

Table 4 Length in pages of research papers (excluding book reviews) published (2009–2011)

Length	Number of papers	Percentage
$x \leq 10$	5	12.5
$11 \leq x \leq 14$	9	22.5
$15 \leq x \leq 19$	16	40.0
$20 \leq x \leq 24$	7	17.5
$25 \leq x$	3	7.5
Total	40	100.0

4.2 Selection of research papers

We give here information on the reviewing process of research papers for which a decision was made between 1 January 2009 and 31 December 2011.

Except for few cases of plagiarism that were fortunately detected and a couple of parallel submissions, the reviewing process of the papers was rather smooth. The collaboration between the three editors and the area editors proved effective and efficient.

4.2.1 Rejection rate

Submissions have been following a regular pace. Between 1 January 2009 and 31 December 2011, 219 decisions concerning research or industry papers were made (to be compared with 136 in the years 2005–2008 and 189 submissions before 31 December 2005).

A total of 32 research papers were accepted, meaning an overall rejection rate of 85 % (79 % in 2006–2008 and 71 % before 31 December 2005). In order to interpret this, rather high, rejection rate one should keep in mind that the editorial policy of the journal, in order to ensure a fast and fair processing of the manuscripts, is to reject all papers needing a major revision. After they have been revised, some of these papers are resubmitted to the journal, in which case they are considered as new submissions.

4.2.2 Time before decision

The mean time between the reception of the paper and the communication of the decision to the authors was 122 days, i.e., 4 months (to be compared with 144 days for papers with a decision in 2006–2008 and 142 days before 31 December 2005) with a minimum of 0 days and a maximum of 698 days. Information on the reviewing time of research papers is summarized in Table 5.

For the 187 papers that were rejected, the mean time before decision was 99 days, i.e., 3 months (130 days for papers processed in 2006–2008 and 125, before 31 December 2005) with a minimum time of 0 days (paper rejected the day it was received) and a maximum time of 497 days.

For the 32 papers that were accepted the average time before decision was 253 days, i.e., less than 7 months (198 days for papers processed in 2006–2008 and 183, before 31 December 2005) with a minimum of 55 days (corresponding to a paper

Table 5 Processing time (in days) of research papers (excluding book reviews, 2009–2011)

Time in days	Number of papers	Percentage
$0 \leq x \leq 20$	62	28.3
$21 \leq x \leq 40$	17	7.8
$41 \leq x \leq 60$	8	3.7
$61 \leq x \leq 80$	7	3.2
$81 \leq x \leq 100$	7	3.2
$101 \leq x \leq 200$	71	32.4
$201 \leq x \leq 300$	32	14.6
$301 \leq x \leq 400$	10	4.6
$401 \leq x \leq 500$	4	1.8
$501 \leq x$	1	0.5
Total	219	100.0

Table 6 Origin and selection of research papers (excluding book reviews, 2009–2011)

Country	Percentage of papers received	Rejection rate (%)
Europe	33.5	68.1
among which BIF ^a	19.0	61.5
UJTSASAAZ ^b	17.5	83.3
Rest of world	49.0	96.0
Total	100.0	86.3

^a BIF: Belgium, Italy, France

^b UJTSASAAZ: USA, Japan, Taiwan, South America, South Africa, Australia, New Zealand

re-submitted after having been rejected because it needed a major revision) and a maximum of 698 days.

4.2.3 Origin of papers

Table 6 summarizes the country of origin of the submissions for which a decision was made between 1 January 2009 and 31 December 2011 (using the same convention as above; Table 7 gives more details).

The fact that the journal is attracting papers from outside the three promoting countries is happily confirmed. It should also be noticed that, within Europe, there is no significant difference between the rejection rate according to the country of origin of the authors: papers coming from Belgium, France or Italy obviously do not receive a special treatment when compared to papers received from other European countries.

A substantial number of papers is received from countries outside Europe and having quite well structured academic systems (mostly from Taiwan and the USA). The very high rejection rate observed for those papers perhaps indicate that researchers in these countries prefer to send their best papers to American journals.

Table 7 Origin of research papers received (excluding book reviews, 2009–2011)

Country	Percentage	Country	Percentage
Iran	15.7	Argentina	1.0
China	12.7	Australia	1.0
India	9.8	Luxemburg	1.0
France	8.8	South Africa	1.0
Taiwan	7.8	Austria	0.5
Italy	5.9	Egypt	0.5
USA	5.4	Finland	0.5
Belgium	4.4	Kazakhstan	0.5
Tunisia	2.9	Malaysia	0.5
Germany	2.9	Mexico	0.5
UK	2.5	Morocco	0.5
Spain	2.5	New Zealand	0.5
Portugal	2.5	Norway	0.5
Algeria	2.5	Poland	0.5
Turkey	2.0	Saudi Arabia	0.5
Canada	1.5	South Korea	0.5
Netherlands	1.5		
Total			100

Comparing Tables 6 and 7, it is clear that papers coming from outside Europe are mainly coming from countries in which academic institutions are still poorly structured and/or financed. We are sorry to say that, although we received many papers from such countries and in spite of our willingness to help colleagues doing good work under poor conditions, we have only been able to accept very few of these papers.

5 Industry papers

Industry papers consist of case studies, state-of-the-art papers on the applications of OR techniques or considerations on the practice of OR in industry. We published 4 papers in this section in volumes 7–9 (down from 6 in volumes 4–6): two of them originate from France, one from Italy, and one from Taiwan. The average length is almost 18 pages, with a minimum of 14 and a maximum of 20 pages. These papers are usually reviewed by the three Editors-in-Chief, using a referee from industry whenever necessary.

Unfortunately, the number of industry papers 4OR manages to attract remains small. The encouraging trend highlighted in volumes 4–6 (an increase by 50% with respect to volumes 1–3) failed to keep its promise.

6 Education papers

Education papers aim at giving an up-to-date exposition of classical OR problems and techniques that are frequently used in OR courses, or casting them in a new light.

Consistently with the past (volumes 1–3 and 4–6), we only received a single submission in 2009–2011. The paper [Feillet \(2010\)](#), which counts 18 pages, was reviewed by the three Editors-in-Chief and was accepted and published in 2010.

7 PhD thesis abstracts

The journal publishes abstracts of PhD thesis defended in Belgium, France or Italy, or by Belgian, French or Italian nationals studying abroad. These abstracts are published under the responsibility of the thesis adviser, who is supposed to send an email to the handling editor (Leo Liberti) confirming that he or she agrees with the abstract. So far, we published all abstracts that satisfy these requirements, although we retain the right to change this in the future.

In the period 2009–2011 we received 38 PhD abstracts, two of which were rejected insofar as they did not satisfy the above requirements. Of the remaining 36, 21 (58.3%) come from Italy or are authored by an Italian national abroad, 9 (25%) come from France, and 6 (16.6%) from Belgium. It was stated in the 2009 Editorial [Bouyssou et al. \(2009\)](#) that due to a previously low intake from PhD abstracts from Italy, an effort was made to improve this state of things. The figures for 2009–2011 confirm the success of our advertising strategy as regards PhD abstracts from Italy. Our intentions for the next 3 years is to get a more equitable repartition from the three states.

As mentioned above, we recently changed our publication policy for PhD abstracts. In order not to penalize our impact factor, we made sure PhD abstracts looked more like abstracts than short papers. The heading only carries the title, the author's name (but not the affiliation nor the e-mail address), and the submitted/accepted dates. The body must not exceed two pages in the Springer journal LaTeX class, and bear no section title nor section breaks. The first paragraph should contain information about: (a) the thesis defense date and time, the adviser's name, the author's e-mail address as well as a URL where the thesis can be downloaded in electronic form. Footnotes are strongly discouraged.

8 What's next?

At the time of writing this editorial, the backlog of accepted papers in *4OR* represents slightly more than half-year of publication at the present publishing pace of 110 pages per issue. This is rather a comfortable situation, but we should not forget that *4OR* is only 9 years old. We recently entered the small world of journals having an impact factor, a world in which competition is fierce. You can help us. Indeed, we would be grateful to our readers for:

- promoting the journal;
- submitting good papers (and suggesting others to submit good papers), and, in particular, industry and education papers;
- citing papers published in the journal;
- accepting refereeing tasks and giving motivated and constructive advice without undue delay;

- making the editors aware of new emerging fields that would give nice invited surveys by well-established scholars.

Furthermore, we are eager to receive comments and suggestions on the present state of the journal and possible directions of improvement. The new editorial team will continue to work hard to make this journal a useful tool for any member of the three promoting OR societies and, more generally, for the whole OR community.

These notes are also the occasion to warmly thank once more our board of Area Editors and all the people that have accepted to referee papers for the journal (the list of referees is published every year at the end of the fourth issue of each volume). Their help has been instrumental in the success of the journal.

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