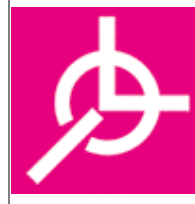


Boletim da Apdio



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ARTIGOS PUBLICADOS NO EJOR (1990-1994) POR PAÍS

As tabelas seguintes traduzem uma análise sumária dos artigos publicados no European Journal of Operational Research, durante o período 1990-1994, por país dos seus autores. A análise e a relevância (ou falta dela !) que os leitores entendam atribuir a estes dados dependerão da perspectiva que cada um tem da IO como disciplina científica. Para acautelar possíveis polarizações da análise convém ter em mente algumas das seguintes observações (a que cada leitor atribuirá um grau de verdade variável): a principal função de um investigador operacional (nao sei se é uma profissão reconhecida oficialmente !) nao será publicar papers, a maioria dos associados da APDIO trabalha em ambiente académico, o EJOR não representa todos os jornais de IO, o EJOR é o mais importante jornal europeu de IO, folhear uma edição ao acaso das americanas Operations Research ou Management Science permite verificar que aqui cerca de 85% dos autores são americanos, e outras precauções prévias sobre estes números. Uma última observação: a situação de Portugal nestas ordenações não está propriamente mal !...

Nº total de artigos (1990-94)

País	Nº artigos	% total	País	Nº artigos	% total
1º USA 1	502.98	37.4	17º Espanha	18.25	1.36
2º Canadá	113.42	8.44	18º Grécia	16.33	1.21
3º Reino Unido	96.41	7.17	19º Suécia	15.50	1.15
4º Holanda	80.67	6.00	20º Turquia	14.17	1.05
5º Alemanha	52.86	3.93	21º Hungria	12.58	0.94
6º França	43.00	3.20	22º Suíça	10.67	0.79
7º Itália	41.06	3.05	23º Coreia	10.33	0.77
8º Finlândia	31.32	2.33	24º Brasil	9.17	0.68
9º Índia	31.17	2.32	25º Dinamarca	9.00	0.67
10º Israel	26.67	1.98	26º N. Zelândia	8.17	0.61
11º Taiwan	25.33	1.88	27º Áustria	8.00	0.60
12º Austrália	20.50	1.52	28º Noruega	8.00	0.60
13º Japão	20.50	1.52	29º Hong Kong	5.83	0.43
14º Bélgica	20.00	1.49	30º Bulgária	5.17	0.38
15º Portugal	19.00	1.41	31º Arábia Saudita	5.17	0.38
16º Polónia	18.33	1.36			

(só são listados os países com uma média superior a 1 artigo por ano)

Nº de artigos por 10 milhões de habitantes (1990-94)

País		País	
1º Holanda	118.556	21º Austria	10.415
2º Finlândia	62.630	22º Hong Kong	9.931
3º Israel	60.701	23º Irlanda	7.654
4º Canadá	42.030	24º França	7.543
5º Luxemburgo	25.641	25º Itália	7.099
6º Nova Zelândia	23.584	26º Alemanha	6.632
7º Bélgica	20.136	27º Bulgária	5.804
8º USA	19.841	28º Polónia	4.845

9° Noruega	18.665	29° Espanha	4.624
10° Portugal	18.252	30° Croácia	4.513
11° Suécia	18.063	31° Kuwait	4.456
12° Dinamarca	17.462	32° Bielorrússia	3.369
13° Reino Unido	16.730	33° Arábia Saudita	3.096
14° Grécia	15.880	34° Turquia	2.407
15° Suíça	15.677	35° Coreia	2.386
16° Eslovénia	13.402	36° Letónia	2.232
17° Singapura	12.518	37° Tunísia	1.79
18° Taiwan	12.188	38° Japão	1.650
19° Hungria	11.922	39° Jugoslávia	1.455
20° Austrália	11.768		

(listados os países com uma média superior a 1 artigo por 10 milhões de habitantes)

OR IN PORTUGAL

PAST ACHIEVEMENTS AND CURRENT PERSPECTIVES

(texto publicado na edição do EJOR "Operational Research in Europe"

comemorativa dos 20 anos da EURO, vol.87, nº 3, Dez. 1995)

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Abstract:

This paper reviews some of the most important aspects of the recent history of OR in Portugal, namely the key role played by academics, the position of OR in the curricula of Portuguese universities, successful applications in industry and the development of APDIO, the Portuguese OR association. After discussing some negative aspects of these achievements the review ends with a suggestion for a new line of action considered essential in order to ensure a favourable evolution of OR in Portugal.

1. INTRODUCTION

Operational Research (OR) arrived in Portugal comparatively late. In spite of this disadvantage it soon reached a status of maturity among academics and practitioners. This status is reflected in the recognition of the contribution of OR to the training of an increasing number of professionals, and through them to support the increasingly complex decision processes which are faced by our organisations in most sectors of activity. In the first part of this review some of the most important aspects of the recent history of OR in Portugal will be analysed.

However, there are negative aspects to these achievements which have been clearly identified and discussed in other countries and if not recognised and combated by our OR community may cloud our collective future. These signs are the subject of the second part of this review. The review ends with the introduction of a new line of action considered essential in order to ensure a favourable evolution of OR in our country.

2. AN AFFIRMATIVE PAST

When we compare the state of development of OR in Portugal in the seventies when it made its first steps, with the present, the enormous development achieved is striking. It is therefore pertinent to look more closely at some aspects of this phase of expansion and consolidation:

- The training of a significant number of academics in foreign universities, mainly European. These academics were key elements in the constitution and reinforcement of the OR groups in the most important Portuguese universities. We believe that the connections that they established have led our OR community towards an attitude of openness to the outside world.
- The strong position of OR in the curricula of Portuguese universities. OR is present today in the curricula of many degrees and Masters courses, either on its own or as a part of courses in economics, management, engineering, mathematics and other disciplines. This wide presence is a reflection of the increasing recognition of the potential contribution of OR through the education of agents of social and economic change, who are crucial to national development.
- The report of successful applications of OR in the solution of problems faced by organisations operating in a wide variety of sectors of activity. The majority of these applications have their roots in work developed by academics (individually, through their companies or through university-community interface organisations) and students (during their last year of in-company training and Masters' dissertations, in both cases under academic supervision).
- The creation and development of an OR association - APDIO - of a substantial size and with considerable drive. APDIO was formally constituted at the end of 1980. It has today about 400 active members. A considerable number when we consider that our country has only 10 million inhabitants. The broad objectives of APDIO, which are certainly similar to those of other

OR societies, are to promote the scientific development and the practical application of OR in Portugal, to disseminate up-to-date information about activities in the OR field and to establish a forum for co-operation among OR scientists and practitioners. Among APDIO's many activities the following deserve mentioning:

- the holding of a national congress every other year (the 1994 congress had 350 delegates and about 100 papers were presented),
- the regular publication of the journal *Investigação Operacional* (twice yearly, with papers in Portuguese and English) and a Newsletter (every six months),
- the award, presented at the national congress, of prizes for the best OR work developed by students of Portuguese universities (at both first degree and Masters levels),
- the electronic discussion list which has recently been created to provide a means for fast and informal exchange of information, data and results between members of the OR community,
- and international meetings, fifteen of which have been organised since 1985 (conferences seminars and workshops included). Two in particular deserve a mention for their size and organisational effort, EURO VIII in 1986 and IFORS 93 (a list of the international meetings organised by APDIO can be found in the Annex).

3. AN UNCOMFORTABLE PRESENT

Two negative signs, which should be identified, can be contrasted with these achievements, namely:

- The implantation of OR in the entrepreneurial world is limited. In fact, the majority of the applications which have been implemented originated in the activity of a limited number of academics who act as external consultants individually or within an organisational framework. Only a few Portuguese companies have in-house OR capabilities either through forming internal groups or by encouraging the careers of individuals on the basis of their OR skills.

- The effort of our technical and scientific community is clearly biased towards techniques, whilst relegating to a secondary role the methodological debate (the contents of the communications presented in the last national congress clearly confirms this fact). Judging by the concerns presented elsewhere this state of affairs does not place us in an uncommon position in the European and international context. In our particular case, the number of students who concluded first and Masters degrees in OR is still very limited. We may therefore argue that there is still a long way to go but that as companies take in future generations of graduates and Masters who are aware of, or have specialised in OR, these problems may be eliminated or at least decreased.

4. TOWARDS A BETTER FUTURE

We believe that many of the Portuguese OR community may be unconcerned about this state of affairs or with the essential questions connected with the evolution of the OR concept, in particular:

- do we genuinely wish to try to understand organisations and learn with decision makers?
- are we making use of soft systems methodologies?
- are we resisting the temptation of adapting problems to standard techniques or, what is equally wrong, ignoring the problems which do not fit in with those techniques?
- are we attempting to analyse in an integrated manner the concept of OR and the characteristics of the learning processes with the objective of improving the methods of teaching/learning OR? In our view the future of our OR community will depend on the regular and effective debate of these and other essential questions. A debate which will be all the more effective if it benefits from the participation and experience of our European colleagues. The objective of this debate which we consider a priority will obviously not be to develop a monolithic concept of OR, but rather to promote a better understanding and a higher degree of articulation of different points of view based on the diversified experience of the elements which form the Portuguese OR community. To this end APDIO will promote in 1996 the organisation of the first national meeting dedicated to methodological matters and teaching.

APPENDIX - LIST OF INTERNATIONAL MEETINGS ORGANISED BY APDIO

- XXI Journées Européennes sur l'Aide à la Décision Multicritère (28-29 March 1985)

- v- OR Models on Microcomputers (25-27 September 1985)

- IFAC/85 on Systems Analysis Applied to Water and Related Land Resources (2-4 October 85)

- EURO VIII, 8th European Conference on Operational Research (16-19 September 1986)

- PMS - Project Management and Scheduling Workshop (11-13 July 1988)

- 3rd Int. Summer School on Multiple Criteria Decision Aid: Methods, Applications and Software (13-30 July 1988)

- 13th Urban Data Management Symposium (29 May-2June 1989) - Sixth EURO Summer Institute (26 May-10 June 1989)

- NATO ASI - Operations Research and Management in Fishing (26 March-6 April 1990)

- Workshop on Large Scale Optimization (29-31 July 1991)

- Workshop on Transport Policies and New Information Technologies (20-22 October 1991)

- Sixth International Workshop on Computer-Aided Scheduling of Public Transport (6-9 July 1993)

- IFORS 93 - XII World Conference on Operations Research (12-16 July 1993)

- Workshop on Man-Environment Integration (7-9 February 1994)

- XIth International Conference on Multiple Criteria Decision Making (1-6 August 1994).