

## Snapshot of the Durch O.R. Society

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SNAPSHOT OF THE DUTCH O.R. SOCIETY

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Report Bdk/OR/7810

University of Technology  
Eindhoven  
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## 1. Introduction

In January-March 1978, I rang up as many members of the Netherlands Society of Operational Research (NSOR) as I could. The aims were three-fold:

- (a) Asking whether they would support a request to their employers for a subvention of EURO III, Third European Congress on Operations Research, Amsterdam, 9-11 April 1979, the main argument being that it was in their own interest for a European conference to be held in the Netherlands.
- (b) Asking whether they would be prepared to distribute a letter canvassing for new members. After an average increase of 23 members per year during 15 years, the membership of NSOR had stagnated since 1974, see table 1, possible reasons for this stagnation being
  - the general economic depression (?)
  - saturation of the demand for membership (?)
  - integration in 1974 of the special OR news bulletin into the general bulletin of the Netherlands Society for Statistics, Biometrics, Econometrics and Operational Research (?)
  - a 30% subscription increase in 1975 from 45 to 60 gld (?)
- (c) Collecting statistical information on the NSOR members. In the membership list, 75% of the addresses were residential addresses. Apart from personal acquaintancy, no statistical information was available.

In view of aims (a) and (b), I tried to contact all members rather than just a sample (the more subsidies and the more new members the better). In total, I reached 372 members, see table 2. Although so far it has not appeared easy to obtain subsidies or new members, all respondents provided the statistical information requested.

The remainder of this note gives the statistical picture of the Dutch OR society. The sequence of the aspects discussed is

- affiliation
- education
- age, also related to affiliation and education
- potential activities.

Table 1. NSOR membership\*

year	number	increase
1958	132	0
1959	138	6
1960	155	17
1961	189	34
1962	203	14
1963	243	40
1964	256	13
1965	277	21
1966	282	5
1967	292	10
1968	316	24
1969	358	42
1970	386	28
1971	414	28
1972	433	19
1973	458	25
1974	487	29
1975	446	*/. 41
1976	460	14
1977	464	4

\* The Netherlands Society of Operational Research is a "Section", founded in 1958, of the Netherlands Society for Statistics, Biometrics, Econometrics and Operational Research. The total membership of the latter society was 1348 in 1977.

Table 2. NSOR members questioned

category	number	percentage
questioned private members and institutional members for the attention of some named person	372	100%
not questioned because		
- living abroad	16	
- no telephone	21	
- secret telephone number	2	
- institutional member <u>not</u> for the attention of some named person	50	
- resigned membership	6	
membership list, Nov. 1977	467	126%

## 2. Affiliation

The hypothesis that about two thirds of NSOR members are employed in "practice" and one third are academics (working in universities) proved to be near the mark. In fact, 32% are academics. Table 3 gives the distribution over sectors. It should be remarked that the Netherlands does not have a large nationalized sector, contrary to some other European countries. It is well known that employment declines in manufacturing industries (secondary sector) whereas it grows in services (tertiary sector) and government, non-profit institutions and education (quartary sector). Therefore, it may be considered favourable for the future that only 28% are working in manufacturing industries.

Membership distribution by firm/institution is very skew. The 372 members belong to 158 different firms/institutions. There are

105 firms/institutions with just one NSOR member

27 firms/institutions with two or three members

26 firms/institutions with more than three members.

Of the latter, 14 are companies and 12 are educational institutions. The top is Philips with 24 members.

Table 3. Affiliation

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Manufacturing industries (secondary sector)	28%
Services and independent (tertiary sector, e.g., banking, transportation, consulting)	20%
Non-profit institutions, semi-government, government, etc. (quartary sector, except education)	16%
Education (of which non-university 4%)	36%
	<hr/> 100%

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### 3. Education

Some introductory remarks about university education in the Netherlands are appropriate. There are four legally protected university degrees:

- mr ("meester"), master's degree in law
- ir ("ingenieur"), master's degree in technology conferred by a university of technology
- drs ("doctorandus"), master's degree of any other faculty
- dr ("doctor"), which is internationally recognized

The first three degrees are obtained after the "doctoraal" examination and open the way to the doctor's degree. Most people consider their studies finished after (but not before) the "doctoraal" examination and do not take their Ph.D. And they have studied quite long enough: although most university programs take 5 years nominally, the average is about 7 years in reality. There is actually a drive from the ministry to shorten programs to 4 years with a maximum period of study of 5 years but this meets stubborn resistance from the universities and - strange enough - from left-wing students.

According to the 1971 census,

- the Netherlands population was 13,060,000
- the number of people with one of the above four university degrees was 95,500 or 0.73% of the population
- the number of people with a Ph.D. degree was 13,000 or 13.6% of those who had the right to take a Ph.D. degree.

There are 13 universities in the Netherlands (one per million inhabitants), three of which are universities of technology (Delft, Eindhoven and Twente, founded in 1905, 1956 and 1964, respectively).

One can study to be a mathematical engineer (math.ir) at all three universities of technology (since 1956, 1960 and 1967, respectively), and mathematical doctorandus (math.drs) at six other universities (mostly since their foundation long ago). A mathematical ir is more synthesis, application, probably more OR oriented; a mathematical drs is more analysis, theory, probably less OR oriented.



Econometrics can be studied at five universities: at Rotterdam, Tilburg, Amsterdam (two universities), and Groningen. The earliest programs started around 1955 and econometrics was only legally recognized in 1969. Usually two specializations are distinguished:

- social or general econometrics
- business econometrics ("bedrijfseconometrie"), which is almost synonymous with operations research.

There are no studies or faculties in the Netherlands called "operations research" or "applied systems analysis", etc.; there are, however, four faculties called "bedrijfskunde" which is alternately translated as "business administration" and "industrial engineering".

Against this educational background, table 4 becomes understandable. I think. The NSOR seems a strikingly learned society. 83% are university-trained, 54% are mathematicians or econometricians (the number of degrees may be slightly overestimated because it was not explicitly asked whether the degree had actually been obtained). Doctor's degrees have been neglected; but the number of full and associate professors who are NSOR members is 50.

Although the NSOR is an "open" society, it seems not to be so "open" in practice. Why are so few members non-university trained? One reason may be the malfunctioning of the training-course for "OR-analyst". The diploma "OR-analyst" is an official diploma conferred by the Netherlands Society for Statistics, Biometrics, Econometrics and Operational Research. In 14 years, only 24 diplomas have been granted. The reasons for this malfunctioning may be

- the diploma "OR-analyst" can only be obtained after other diplomas in statistics have been obtained
- the rules and regulations are too complicated
- the course is badly marketed and the whole image of OR is too little known or even unfavourable.

It seems to be very difficult to improve this situation.

Table 4. Education

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econometrician	20%
math. ir	15%
math. drs	19%
non-math. ir	19%
non-math. drs	10%
non-university	17%
	<hr/>
	100%

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#### 4. Age

The age distribution of NSOR members is given in table 5. The modal class is 35-39 years. We cannot conclude from this distribution that NSOR members are growing old. Older (and richer) people may just have a relatively higher propensity to become NSOR members than younger people. But we should be cautious: if in a few years' time the modal age class moves up to 40-44 years, then we can conclude that NSOR members are growing old.

Aggregating into three age groups,

- 34% is younger than 35 years
- 36% is 35-44 years
- 30% is older than 44 years.

Tables 6 and 7 give the distributions of affiliation and education, respectively, for these aggregate age groups.

Table 6 is surprising because young people are not clearly employed relatively more frequently in Services or Education than old people. They are, however, employed relatively more in Non-profit institutions, etc., and relatively less in Industry.

Table 7 is surprising because, if we compare the distributions from right to left (from old to young):

- there are strong increases in the percentages of econometricians and mathematical engineers
- the percentage of mathematical "doctorandi" is constant
- there are strong decreases in the percentages of non-mathematical university-trained and non-university trained people. Of the age group under 35, only 10% is not university-trained.

This may in part be caused by the fact that econometrics and mathematical engineering are relatively "young" studies, only recently attaining a "market share". In part, however, it may signal a debatable trend of the society focussing more and more on (applied?) mathematics and becoming less and less faithful to the broad and idealistic credos of OR, obligatorily professed time and again in OR journals and society constitutions.

Table 5. Age

20-24	2%
25-29	12%
30-34	20%
35-39	22%
40-44	15%
45-49	12%
50-54	10%
55-59	4%
60-64	3%
65-69	2%
	100%

Table 6. Affiliation and age (percentages)

affiliation	age			total
	≤34	35-44	≥45	
Industry	17	37	31	28
Services	20	22	17	20
Non-profit, etc.	25	10	13	16
Education	38	31	39	36
	100	100	100	100

Table 7. Education and age (percentages)

education	age			total
	≤34	35-44	≥45	
econometrician	31	24	4	20
math. ir	23	18	1	15
math. drs	19	19	18	19
non-math. ir	10	15	33	19
non-math. drs	6	7	19	10
non-university	10	16	26	17
	100	100	100	100

## 5. Activities

One of the questions posed was whether the respondent was interested in giving a lecture before the NSOR, or reviewing a book, or refereeing an article, and on what topic. It was expected that the number of members interested in contributing one of these activities would be much larger than the circle of those who were known at that moment and would be regularly invited to lecturing, refereeing, etc. (NSOR speakers are almost always invited, there are no "open" meetings for which a call for papers is issued). This expectation came true. 205 people (55% of the respondents) offered to contribute one or other of these activities.

Another expectation was that "academics" (people working in universities) would be overrepresented in these activities. To some extent this came true, see table 8. The "teachers" comprise 47% of the "active" respondents interested in contributing one of the activities mentioned, whereas they only comprise 36% of all respondents. Fortunately, another 53% of the "active" respondents are working in "practice" (although this is no guarantee that their work is "applied"). It would be a pity indeed if a professional OR society would be predominantly run by academics, although their services may be very valuable.

Table 8. Affiliation of all and "active" respondents  
(percentages)

affiliation	respondents	
	all	"active"
Industry	28	22
Services	20	17
Non-profit, etc.	16	14
Education	36	47
	<u>100</u>	<u>100</u>

## 6. Concluding remarks

This note has given a statistical snapshot of the Netherlands OR Society (NSOR). Trends for the future can hardly be discerned from this one picture, although one must be aware of potentialities like the membership moving outside industry, the society becoming more learned and more mathematics oriented, and the age distribution shifting upwards. Conclusions can only be drawn if in a few years' time a comparable survey is made.

Statistical pictures of other European OR societies would be most interesting. The hypothesis is that there are substantial differences in OR ideas and practices in the various European countries, which would be reflected in the composition of the various OR societies. An international comparison would yield valuable information for the optimal course of action to be taken by the EURO Association.