Overall Results of the OR Practice Survey

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Abstract

- IFORS have commissioned a survey of OR practice in member countries, so as to gain a better understanding of the usage of quantitative tools, techniques and approaches and their impact on decision-making in organisations, as well as the background of the OR analysts involved.

- It is expected that the results will enable IFORS to improve their support to and promotion of OR in member countries.

- Over 250 practitioners from 28 member countries completed a comprehensive on-line questionnaire and some overall results will be presented.

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Objectives

- To enable a better understanding of:
  - usage of quantitative tools, techniques and approaches and their impact on decision-making in organisations,
  - the background of the OR analysts involved.
- All (active) 49 country members of IFORS included
- Contact via IFORS country Representative
- HORF Support in UK, INFORMS too

Methodology

- ## Initial questionnaire
  - – to collect some basic information
  - – to assess the likely response to the main questionnaire

- ## Main questionnaire
  - – To collect detailed information from individual OR analyst/consultants

Initial Survey

– 34 out of 49 countries responded, including 13 from EURO

– Limited awareness of OR practice in many countries

– Analytical work not always labelled OR

– Significant OR practice by academic consultants in some countries

– High response to main survey unlikely

Survey Design Compromises

- Single or multiple questionnaires
  - OR practice varies in maturity between countries
    - Classification?
    - Ease of analysis
- OR groups basis vs OR activity
  - Comparison with previous work on groups

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Main Questionnaire

- ## Three Main Sections
  - Country/Name/Position in Organisation
  - Organisational Information
    - Size, sector, OR and organisation characteristics
    - Competing groups, barriers to use of OR
  - Personal Experience of OR Practice
    - Academic background, On-the-job training, membership of professional societies
    - Use/Understanding of OR techniques and software
    - Application Areas

Responses by Region & Organisational Type

| Region Orgn. Type	ALIO	APORS	EURO	NORAM	TOTAL
Public	0	3	59	13	**75** 30%
Private	2	14	25	41	**82** 31%
Consultancy	2	12	21	20	**55** 22%
Academic	8	6	16	12	**42** 17%
Total	**12** 5%	**35** 14%	**121** 47% (UK = 84)	**86** 34% (US = 73)	**254** 100%

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Size of Organisation 1

Turnover of your organization - 184 Responses
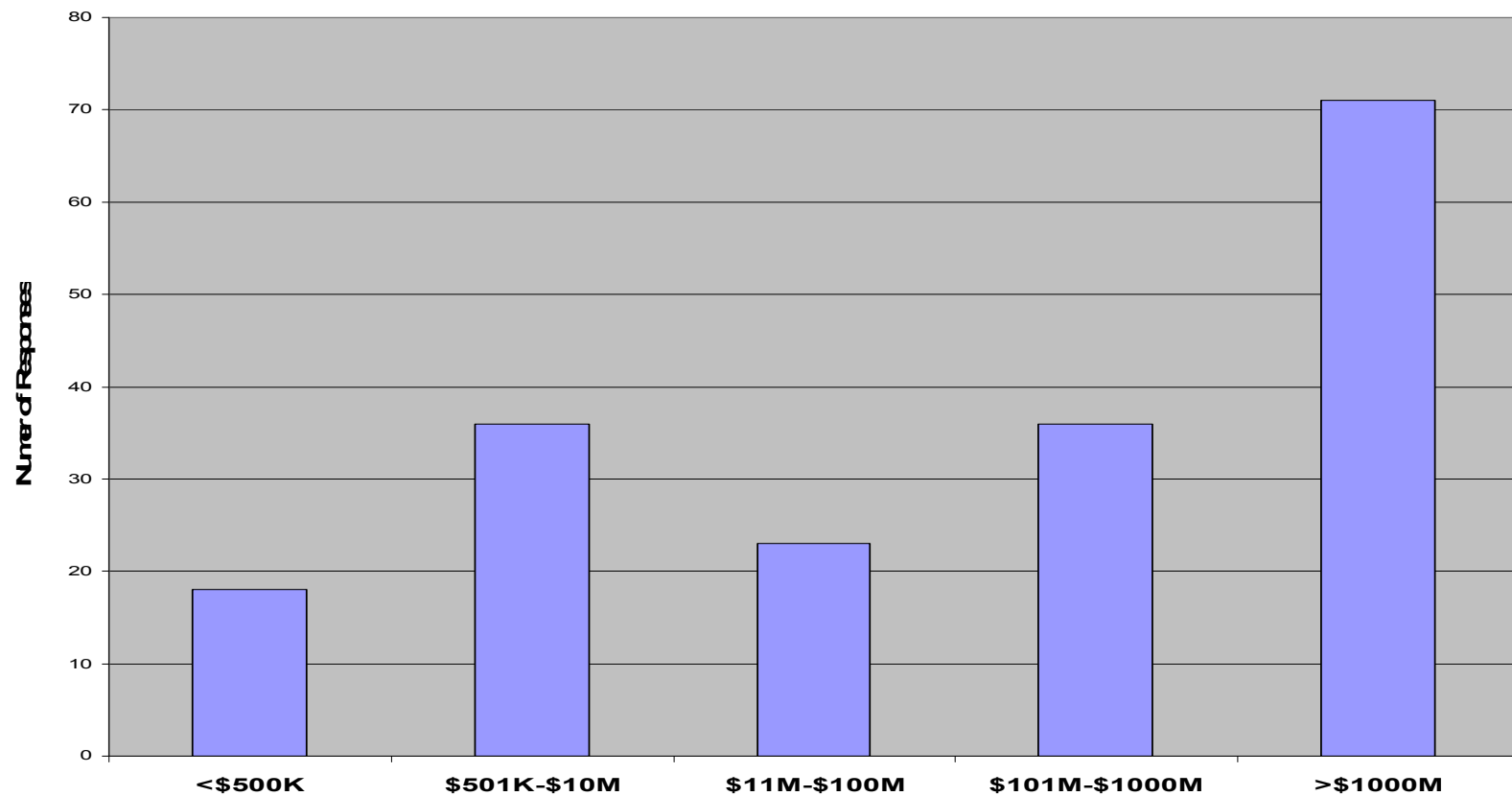
Size of Organisation 2

Number of employees in your organization: 208 Responses
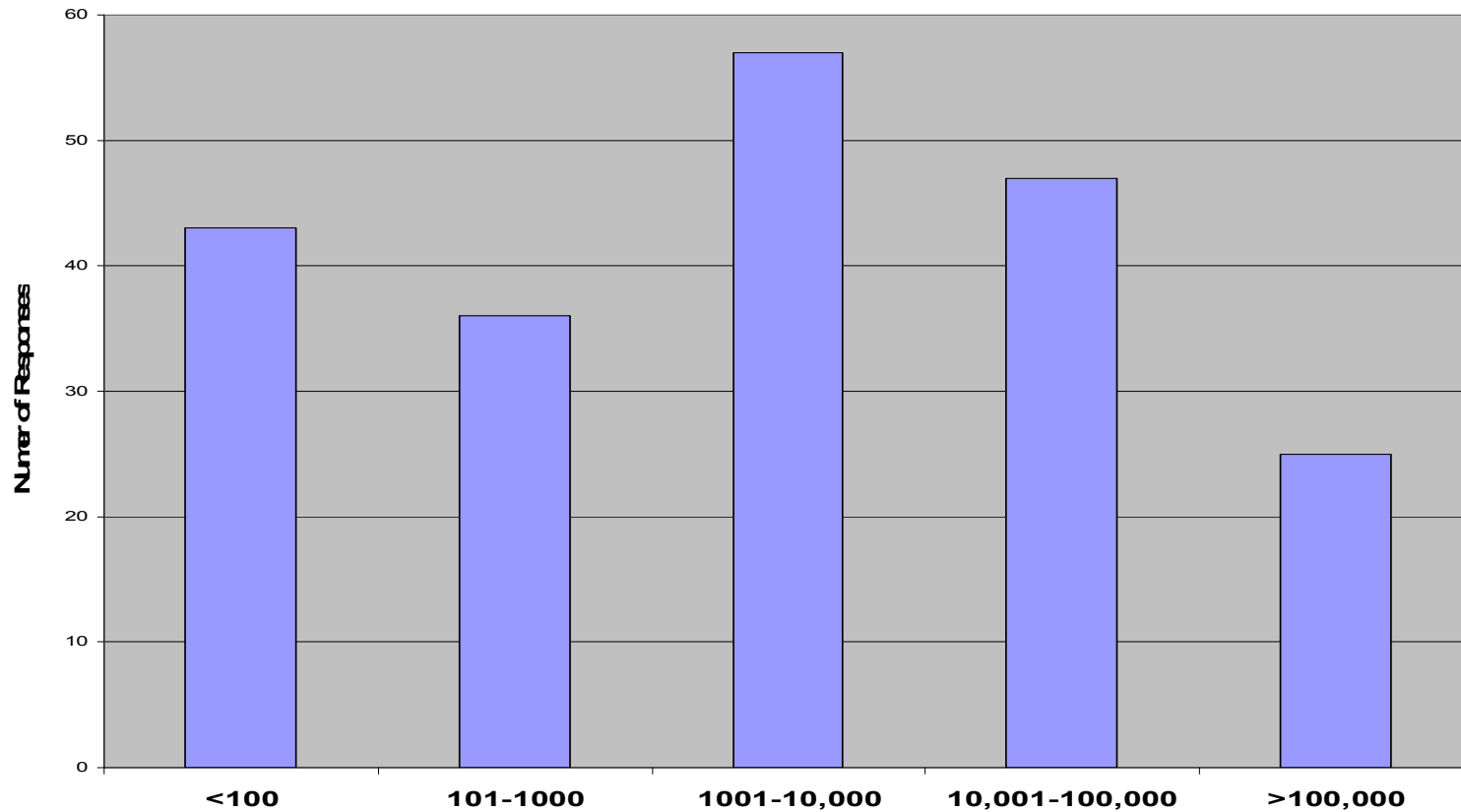
Industry Sector

Sector	Responses
Public, incl. defence, police	55 (25%)
Ext. consultancy – commercial	37 (17%)
Ext. consultancy – academic	28 (13%)
Transport	20 (9%)
Technology	15 (7%)
Health	11 (5%)
Industrial	10 (5%)
Other	42 (19%)
Total Responses	218

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How is the OR Service Provided?

	Responses
Central	64
Dispersed	58
Mixture	56
Total	178

Name of Group

Words in Title	Responses
Operational/Operations Research	46 (29%) (13 in UK Govt)
Opns. Management, Ind. Engineering etc	9
Analytics	9 (All in USA)
Total Responses	158

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Objectives of 'OR' Group

	Responses
OR Services	73 (45%)
Manufacturing,Logistics	29
Process Improvement	14
Marketing support	10
Software sales & use	7
Other	28
Total	161

Location of OR Group (non-academic organisations) – most common

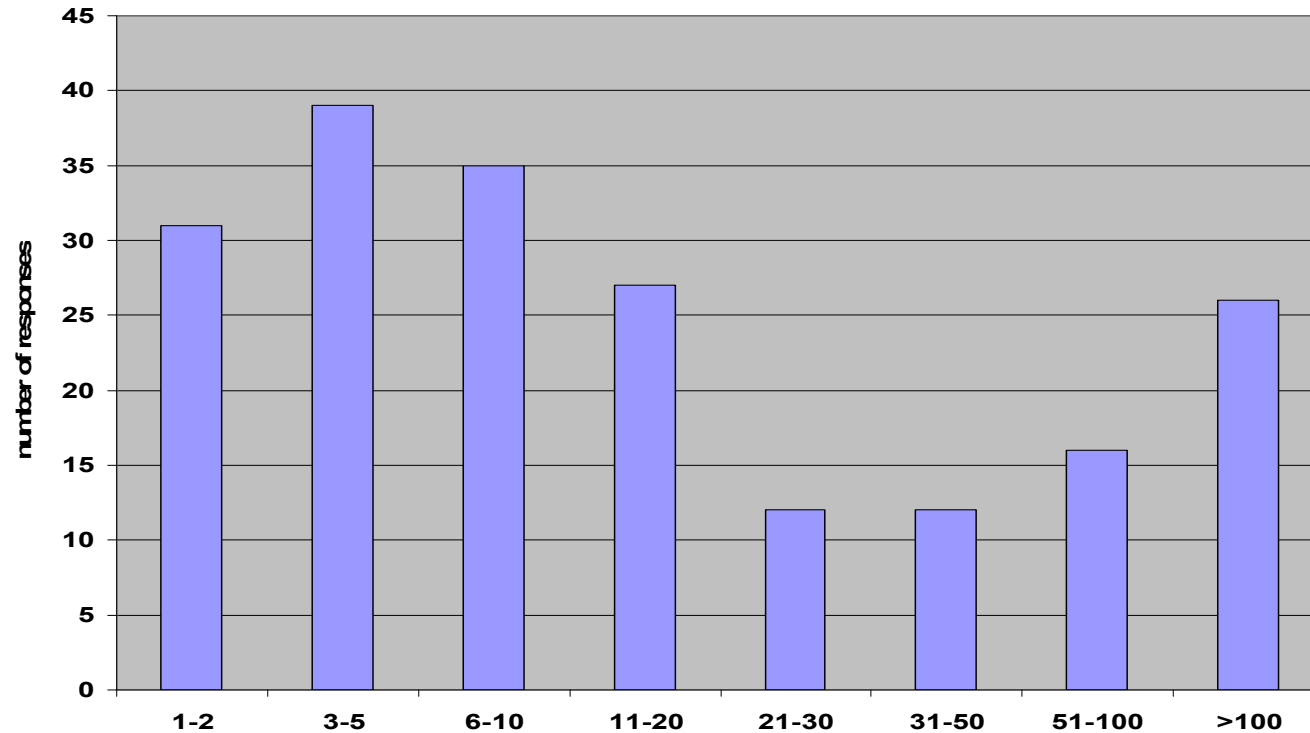| Location	Number of Groups
Operations/logistics	34
R & D	20
Strategy	14
Sales/Marketing	7
Consultancy	7
Finance	6
IT	6

Size of OR Group

Size of the OR Group (197 Responses)
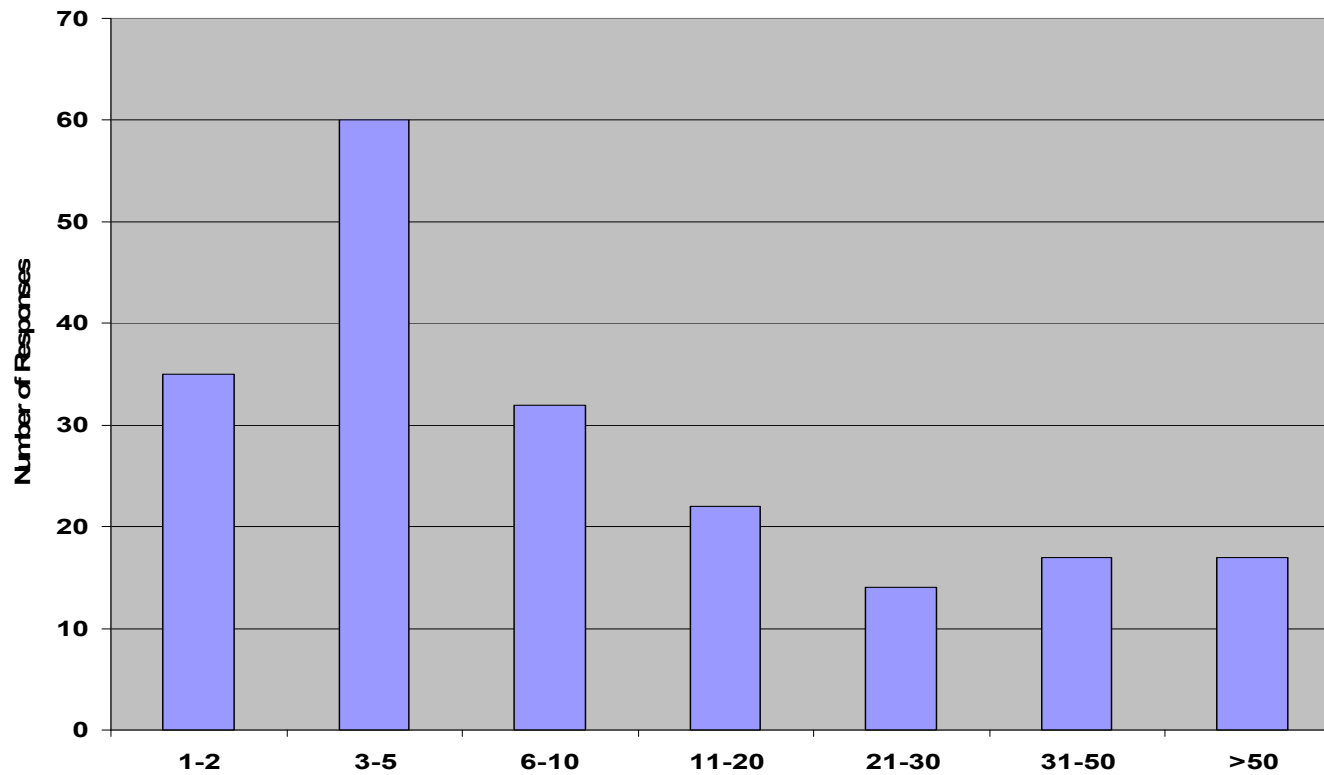
Number of OR Staff across the Organisation

Approximate number of OR staff across the organization (214 Responses)

Financial Control: are projects charged directly to clients?

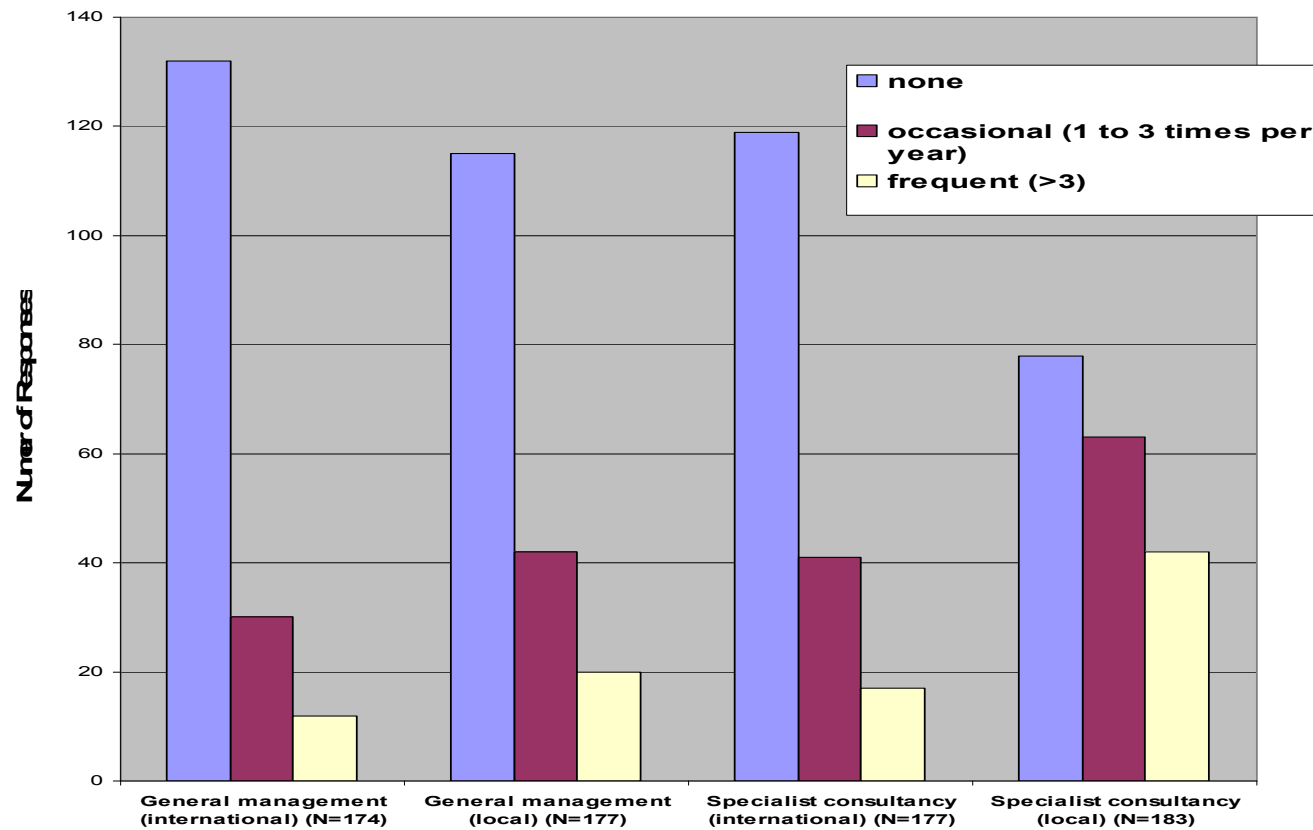|	Number of Groups	% of Groups
Yes	102	52
No	98	48
Total Responses	200	100

Reporting Level of OR Group Manager

Reporting level of group manager (191 Responses)
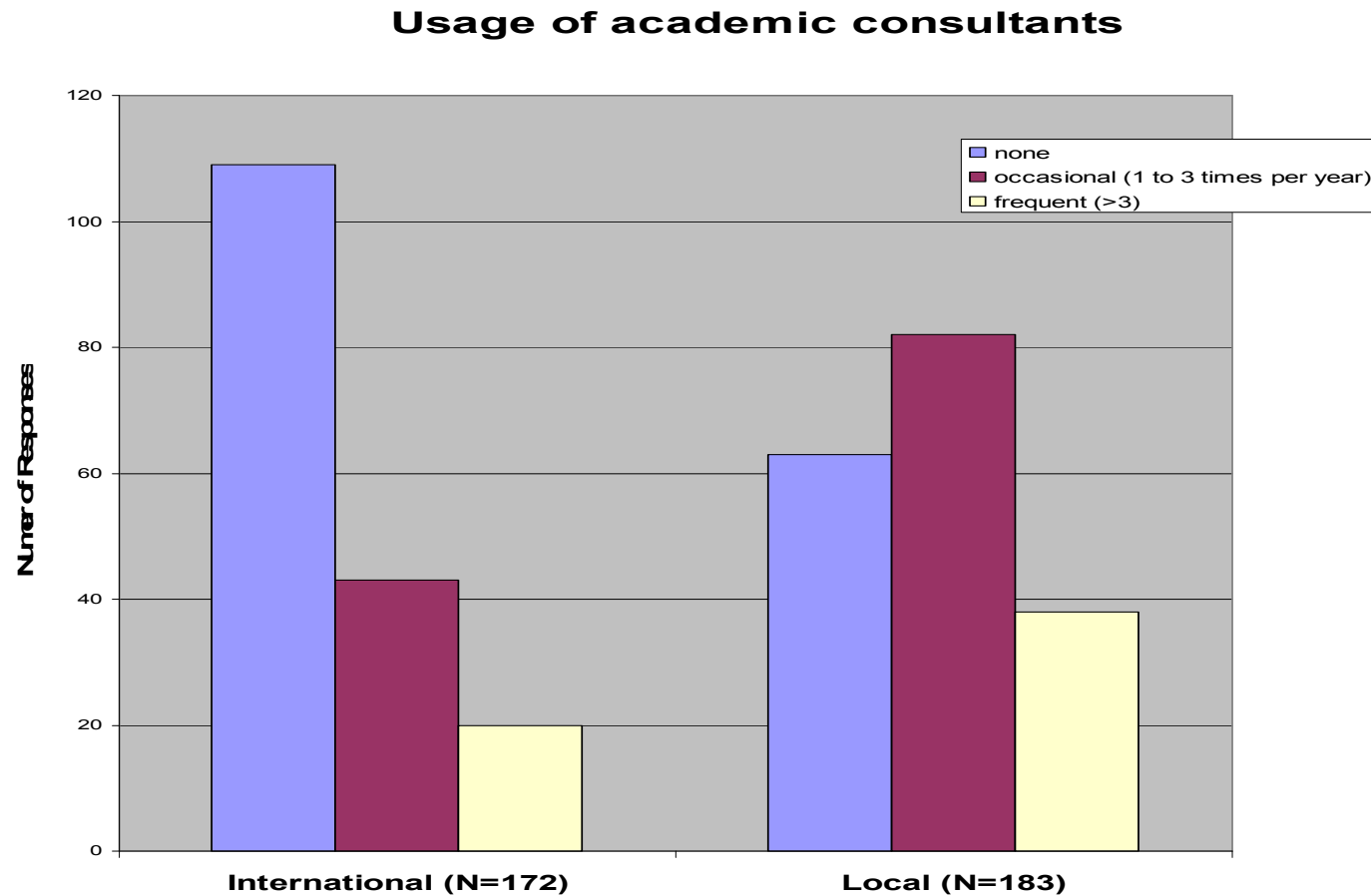(How many levels from Chief Executive?)

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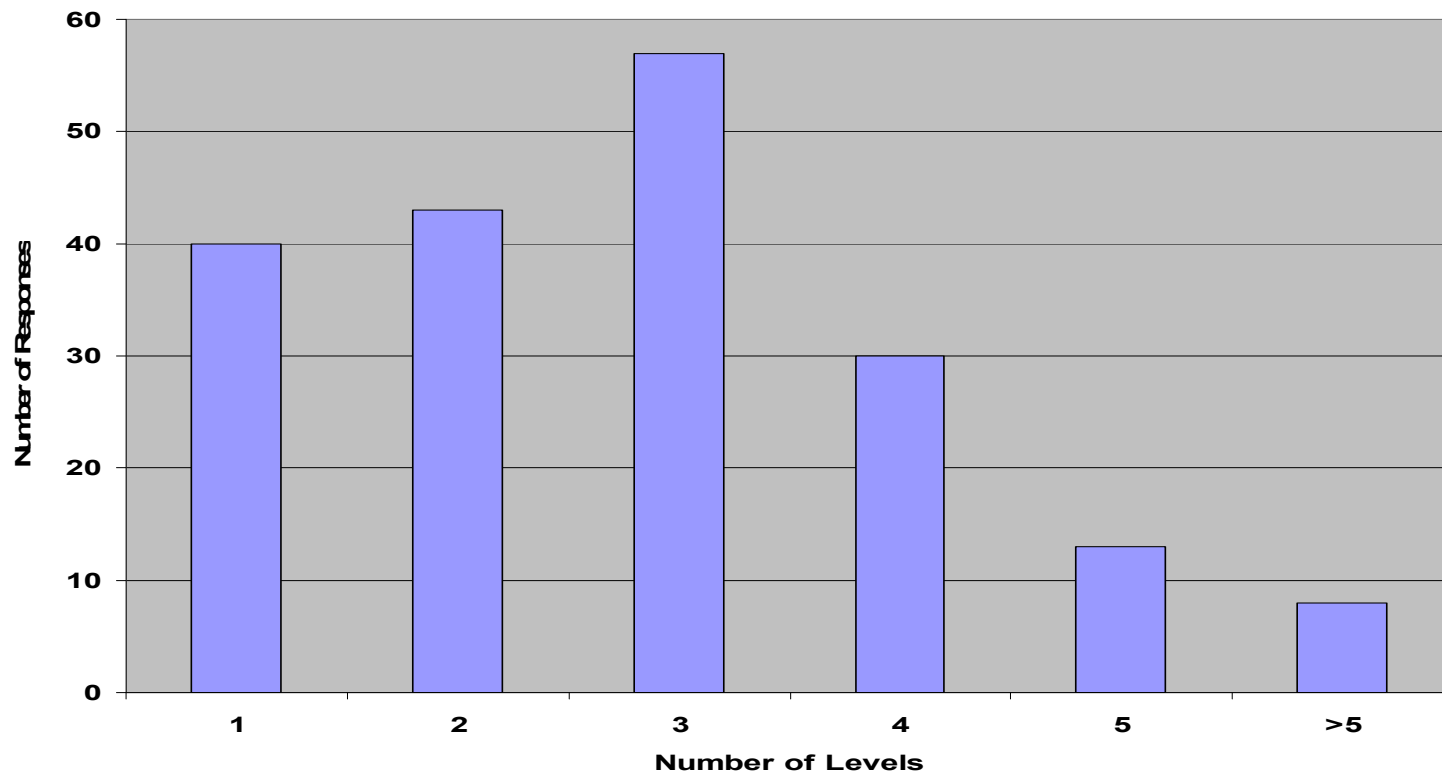
Usage of External Commercial Consultants for OR work

Usage of external commercial consultants

Usage of Academic Consultants for OR work

Usage of academic consultants

Legend:
- none
- occasional (1 to 3 times per year)
- frequent (>3)

Y-axis: Numer of Responses (0 to 120)

X-axis categories: International (N=172), Local (N=183)

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Perceived Barriers to the Use of OR

Barriers to the use of OR (max 254 responses)

Categories (x-axis): Staff cost, Training cost, OR software cost, Computer hardware cost, Staff lack expertise, OR software inadequate, Data limitations, Lack of Company support, Company unsure of benefits, Company's lack of awareness, Lack of Client understanding, company's culture unsuitable

Legend: Importa
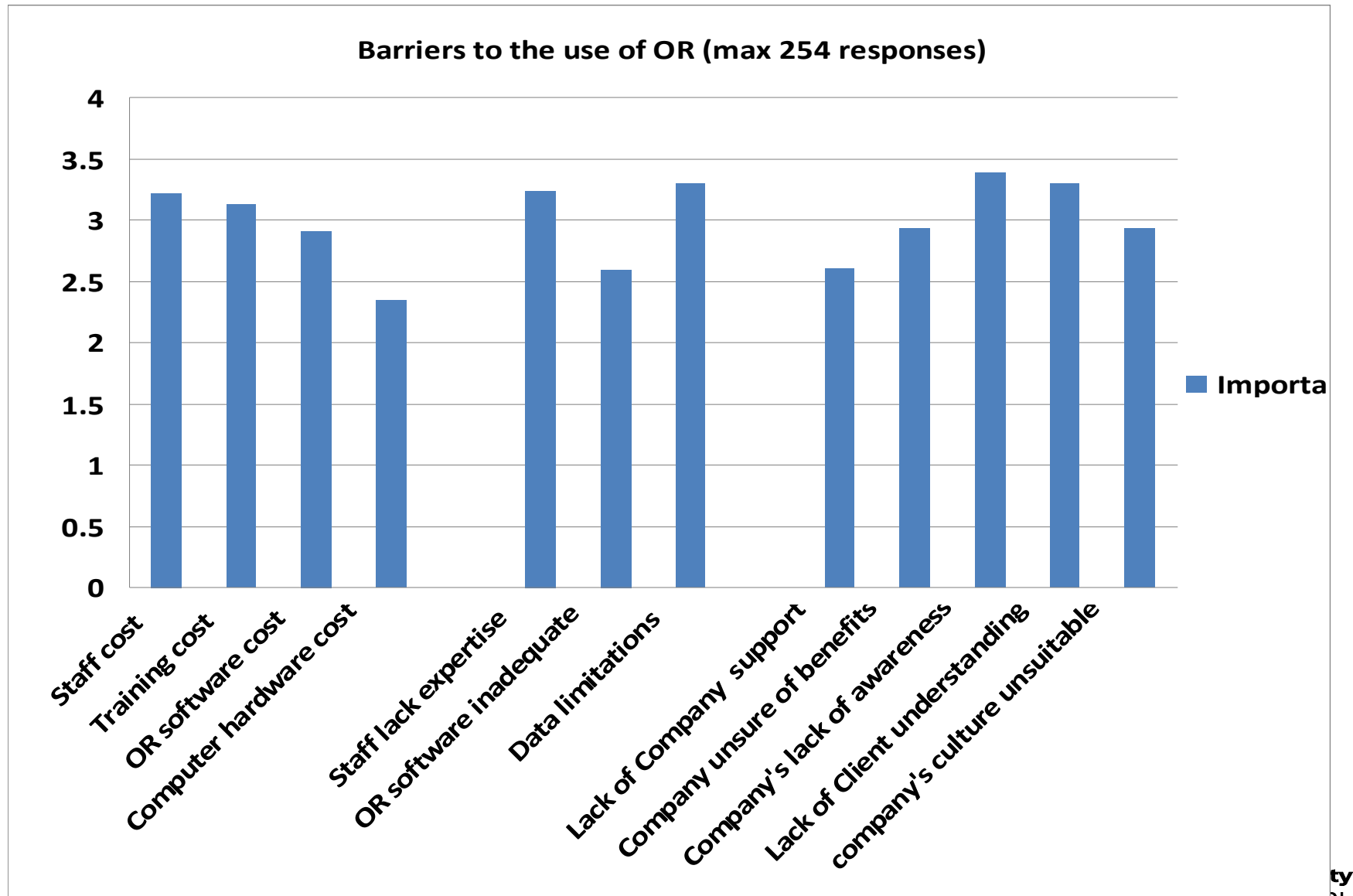
Subject of First Degree

SUBJECT	ALIO	APORS	EURO	NORAM	TOTAL	(%)
Maths/Stats	2	8	46	23	79	(35)
Sciences	0	4	26	5	35	(16)
Engineering	2	4	7	19	32	(14)
Industrial Eng.	4	11	4	11	30	(13)
OR/MS	1	4	13	3	21	(9)
Other	3	1	14	11	29	(13)
Total Known	12	32	110	72	226	(100)
Unknown	0	3	11	14	28	
Total Returns	12	35	121	86	254	

Postgraduate Qualifications

Qualification	ALIO	APORS	EURO	NORAM	GLOBAL(%)
MSc OR/IE	2	14	43	26	85 (33)
MSc - other	2	0	29	26	57 (22)
PhD OR/IE	6	2	7	25	40 (16)
PhD other	2	8	28	14	52 (20)
Total	12	24	107	91	234
No PGQs	0	12	19	6	37 (15)
With PGQs	12	23	102	80	217
Sample size	12	35	121	86	254 (106)
% with PGQs	100	66	84	93	85

On-the-Job Training

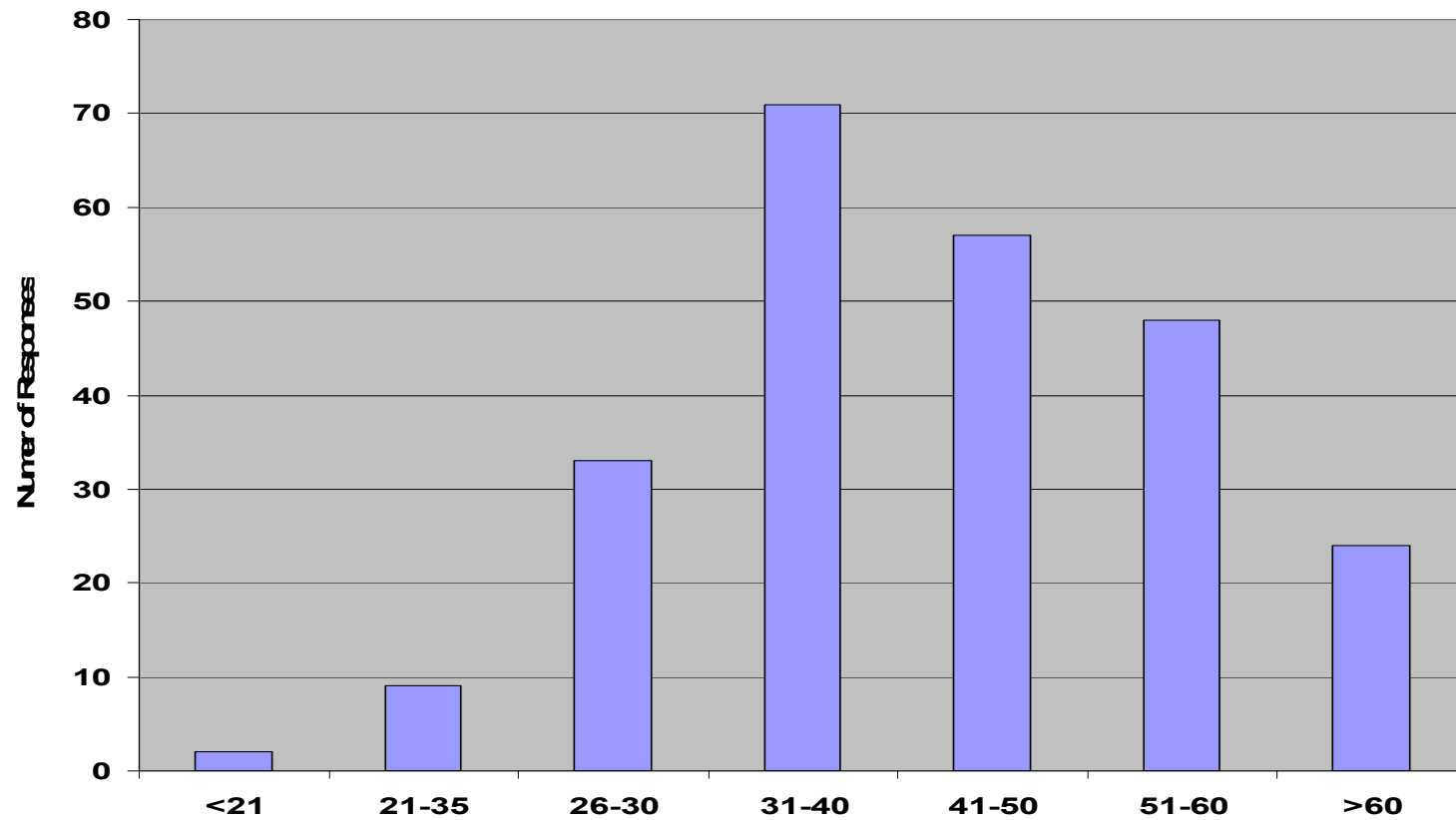**On-the-job training - Maximum 254 Responses**
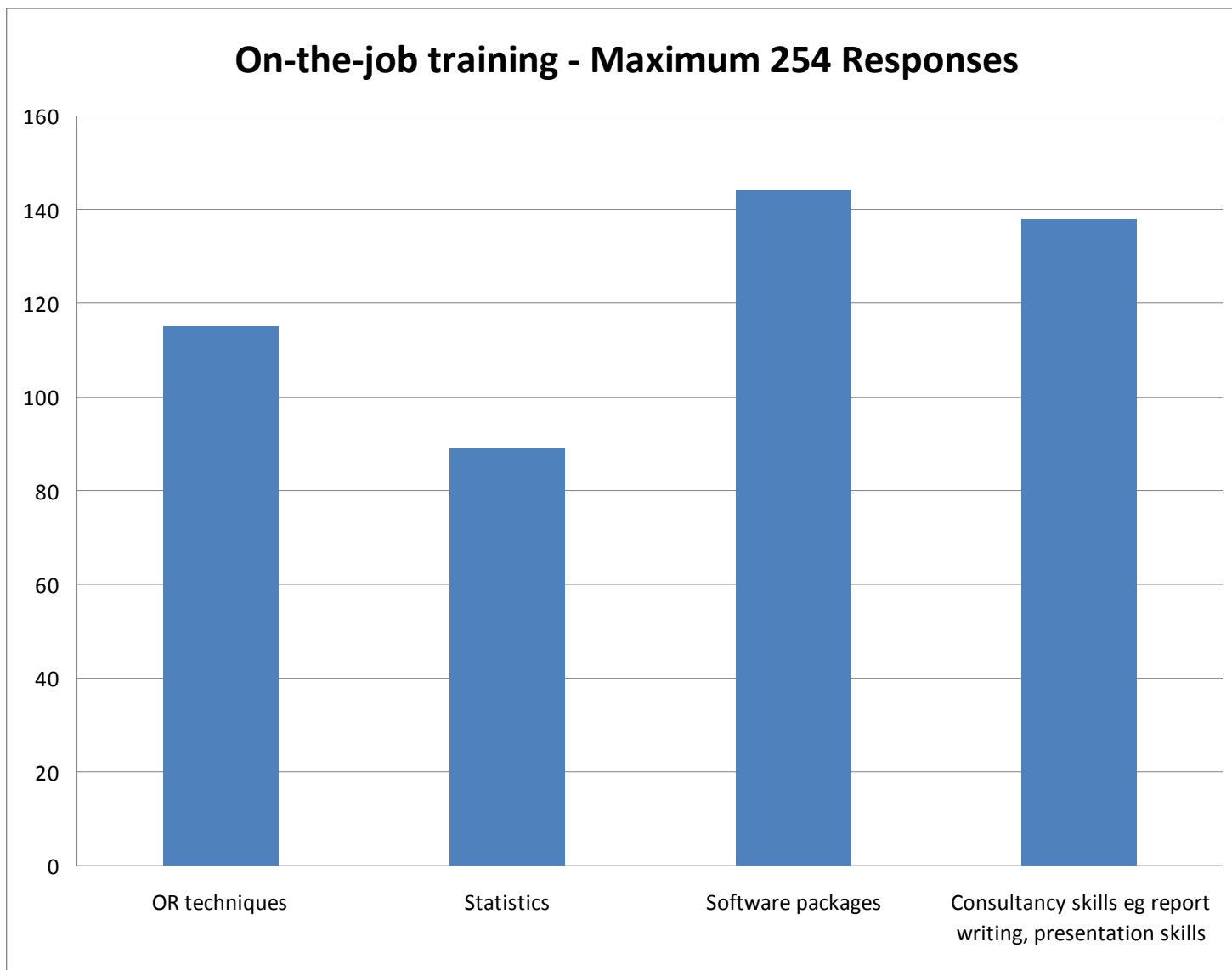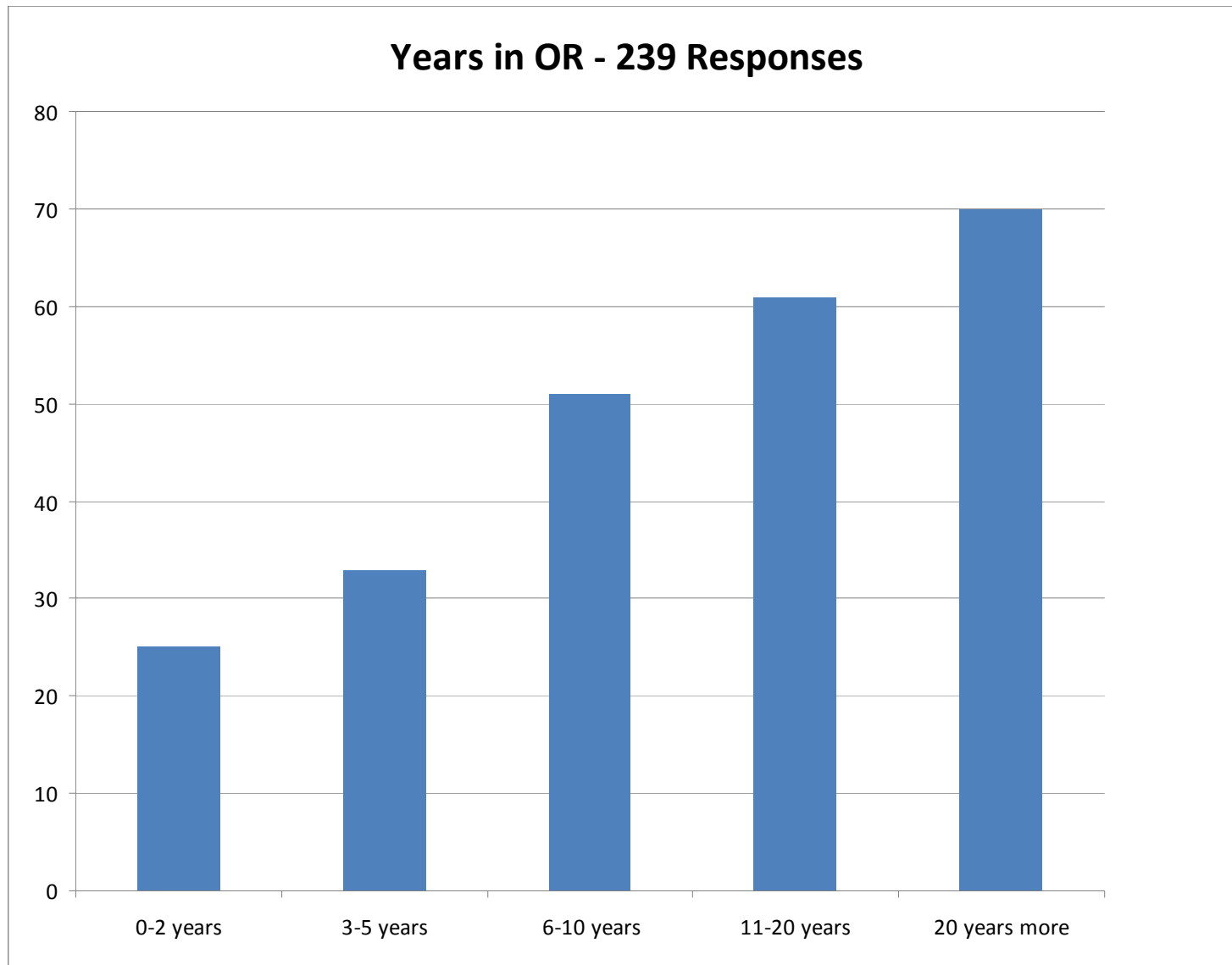
On the Job Training: Other Courses

- Few responses, mostly on aspects of consultancy skills (eg client negotiation) and understanding management functions

- Project management (6 mentions)

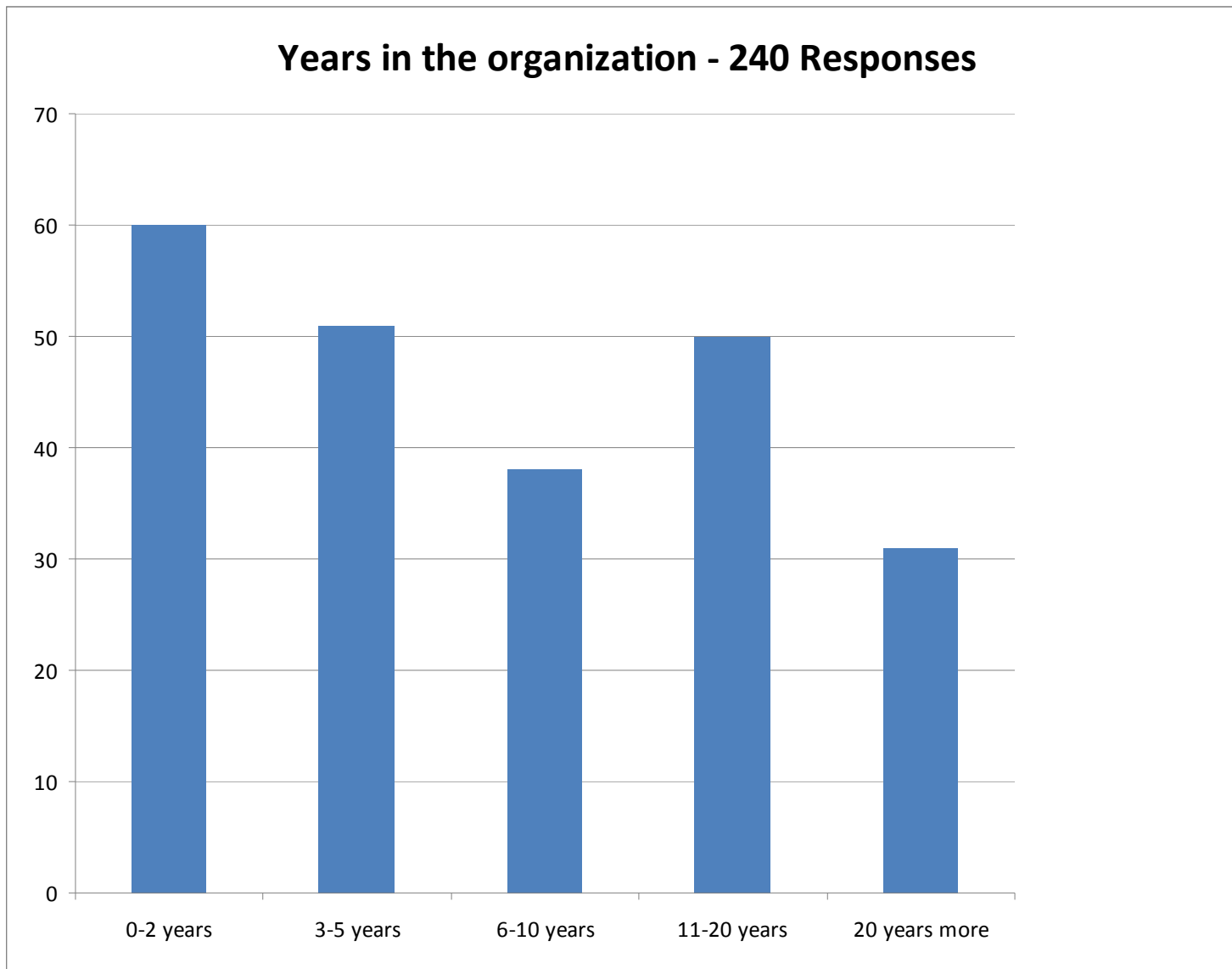- Facilitation (5)

- Leadership (just 4!)

Age of Respondents

Age of Respondents (244 Responses)
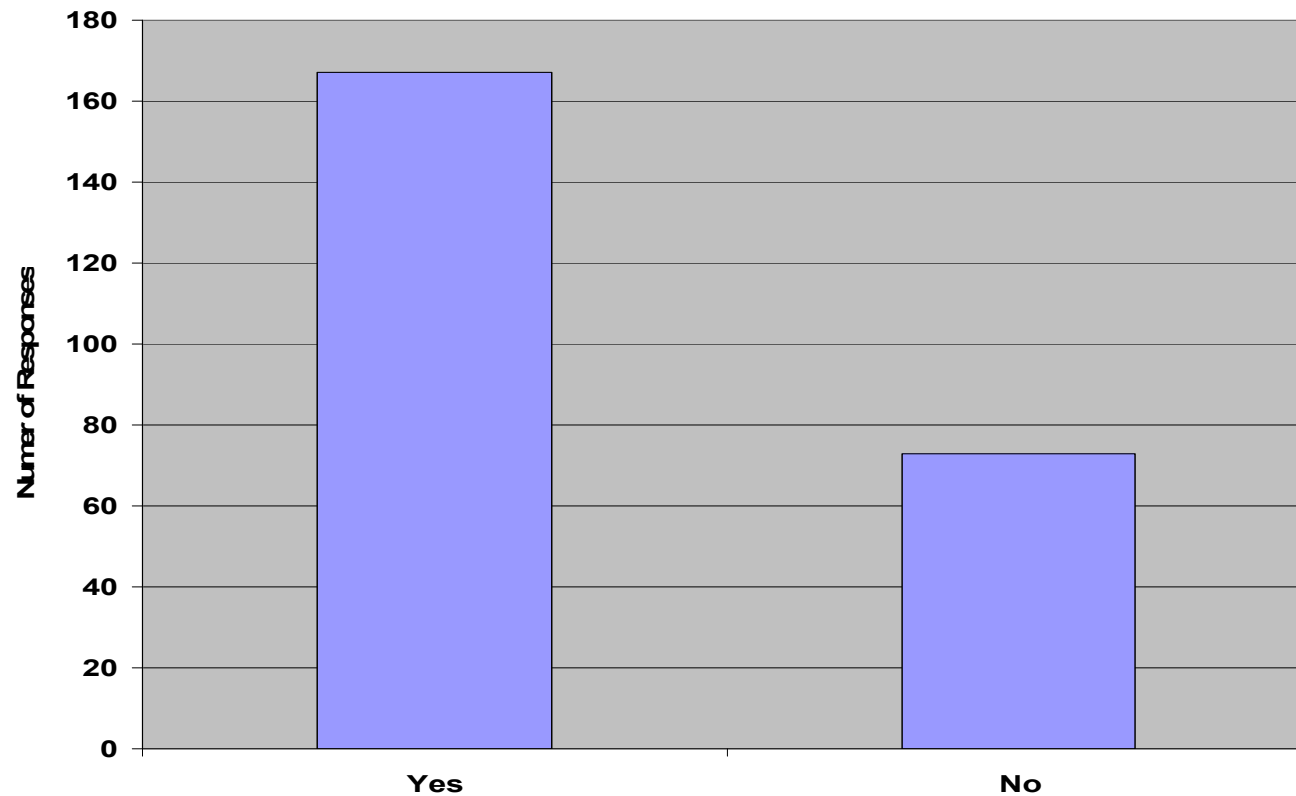
Personal Experience: Years in OR

Years in OR - 239 Responses

Years in Current Organisation

Years in the organization - 240 Responses

Membership of Local OR Society

Membership of Local OR Society (240 Responses)
(69% = YES)

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Membership of OR and Other Professional Societies

Society	Number
None	129 (51%)
INFORMS	29
IEEE	14
SIAM	13
Military OR	8
APICS	6
Other	134

Occasional and Frequent Use of OR Techniques: 8 Most Popular

Your Personal Understanding and Use of OR and related techniques
Top 8 techniques – Maximum 254 Responses
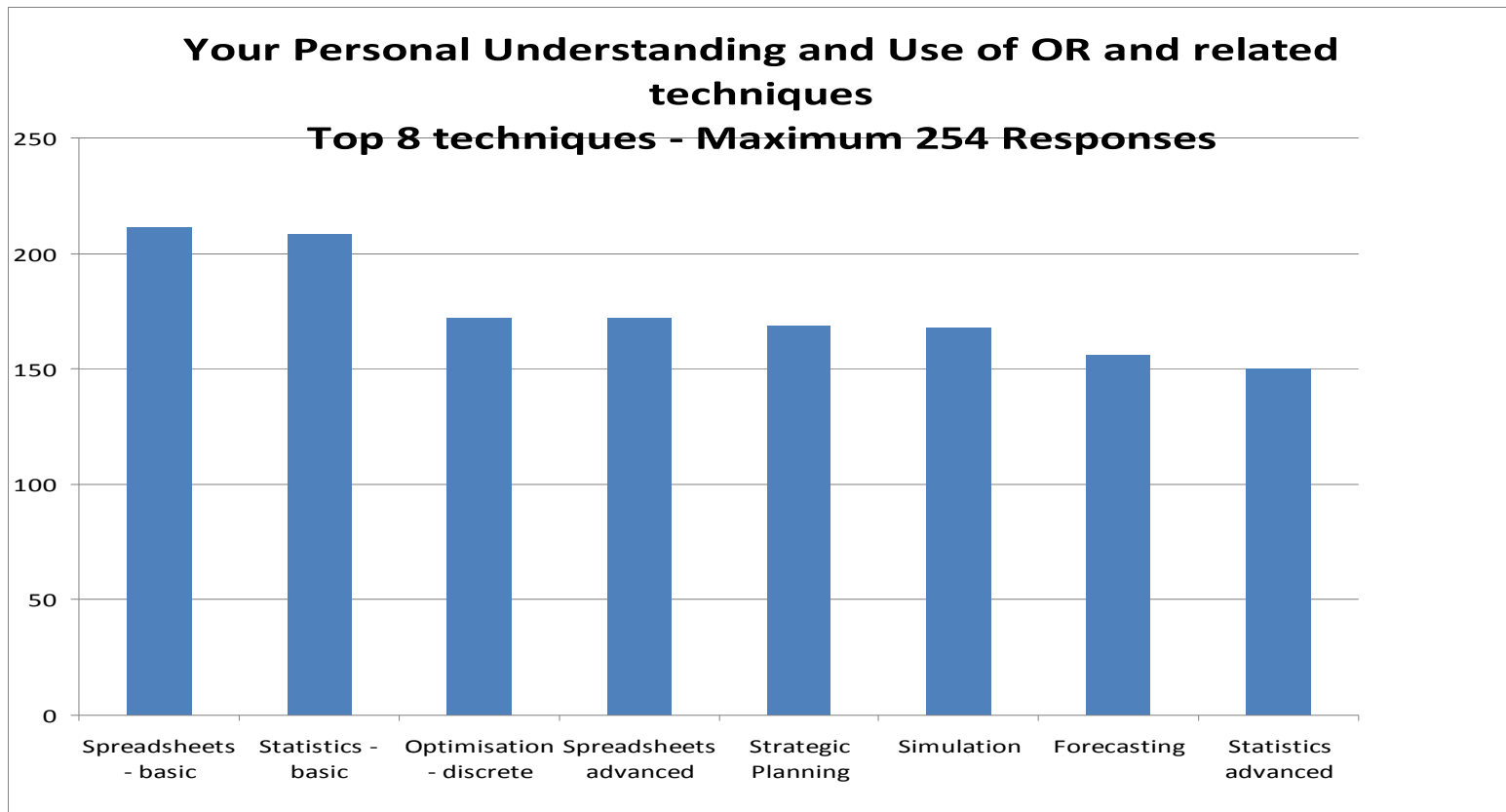
Occasional and Frequent Use of OR Techniques: 9 - 16 Most Popular

Your Personal Understanding and Use of OR and related techniques
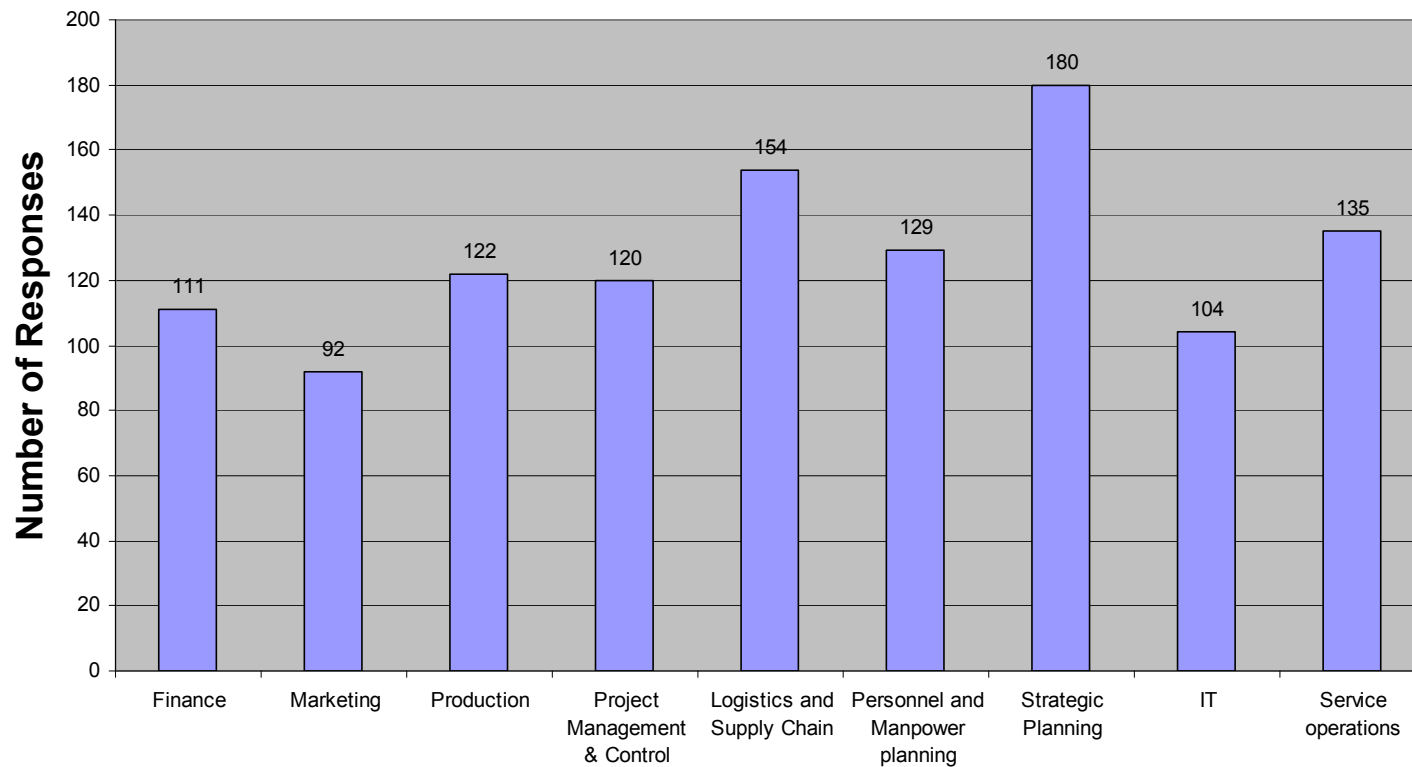**Next 8 techniques**
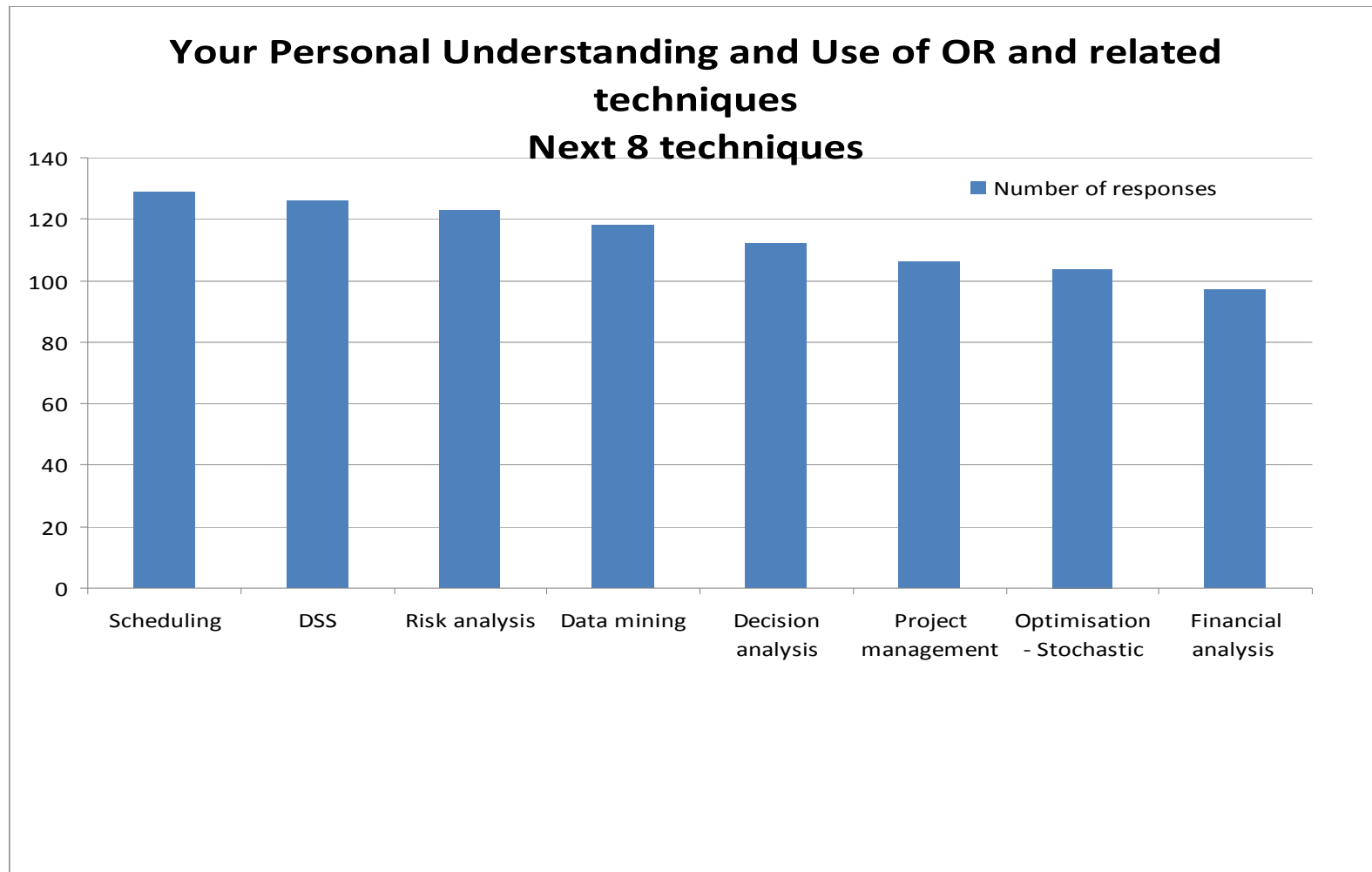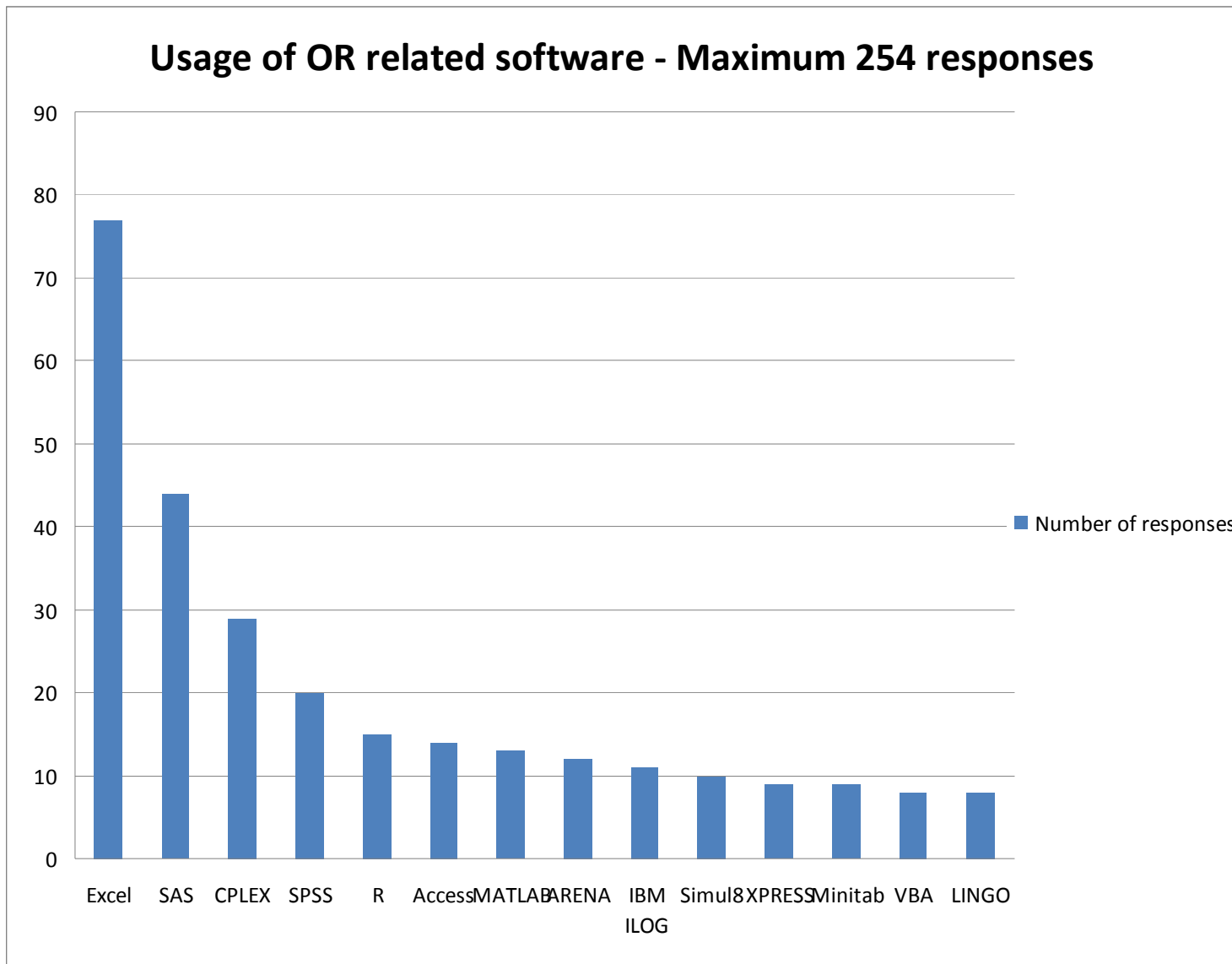
Use of OR Techniques - Summary

- Many OR techniques are used regularly
  - Spreadsheet Analysis and Statistical Analysis are the most common
  - Problem structuring (Soft OR) approaches are mainly used in the UK

Application Areas

Application areaa of your OR work (ALL)

Usage of OR Related Software

Usage of OR related software - Maximum 254 responses

Comments on the Survey

- Low and zero response from many countries
  - 62% of responses from UK & USA
- Good balance between public, private, consultancy & academic organisations
  - But low response from small/medium private companies
- No understanding of OR-type practice outside the OR community

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Summary of Results 1: Personal Experience of OR

- OR Practitioners are highly qualified academically
    - 85% have postgraduate qualifications
- 69% belong to the local OR Society
- 49% belong to other OR and professional societies
- 55% have more than 10 years in OR (average = 12 years)
- Nearly 50% have 5 years or less in current organisation (but average = c8.5 years)

Summary of Results 2: OR Practice

- Application Areas
  - Good spread across all functions
  - Strategic planning & logistics most popular
- Use of techniques
  - Many used regularly (spreadsheets, stats.)
- Use of Software
  - Limited use of OR software (except Excel/stats)
- On the Job Training common
  - Over 50% on software, consultancy skills

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Summary of Results 3: OR Practice

- OR consultancy via academics is significant in some countries

- 'Operational Research' is rarely used in an OR group's name

- Company's lack of awareness of OR and clients' lack of understanding of OR are key barriers to wider use

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Final Comments

- IFORS Country Representatives have limited knowledge of OR practice or contact with OR practitioners
  - Action for IFORS and Country OR Societies
  - Publicise successful activities to involve practitioners
- INFORMS and ORS are reaching out to the wider analytics community

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