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Serving the world: which interests do operations management academic journals serve?

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Abstract

We apply Social Network Analysis (SNA) to editorial review board membership data of 38 journals in the Operations and Technology Management list of the Academic Journal Quality Guide of the (UK) Association of Business Schools. The journals are grouped in to seven interest groups (communities) based on their network connections and attributes examined for the groups. Review board members are shown to be overwhelmingly male, affiliated to business schools and USA-based institutions. A key network feature is the strong connections between eight journals belonging to the logistics and supply chain area that surprisingly includes the Journal of Operations Management.

Keywords: journals, networks, review board members

Introduction

According to the EUROMA 2012 conference website, "the overarching theme of the conference will be Serving the World. The theme emphasizes the shift from a traditional production operations focus to a more service-oriented focus that many companies in the Western world face and which also affects academic research. The theme also highlights the fact that procurement, operations and supply chains have become more global."

In this paper we investigate how the Operations Management (OM) academic community is configured to respond to this clarion call to serve. In particular we examine how the OM research community reflects various interest groups or smaller, composite communities. Assessing the overall position comprises a substantial endeavour and so we limit our focus to analysing a key expression of academic community, namely academic journals; but do so bringing a novel approach to bear.

We address the research question: how do the characteristics of operations management journals and their editorial review boards reflect the various interest groups within the field? We use social network analysis (SNA) (Scott, 2003,

Wasserman and Faust, 1999) as the main technique to connect journals, academics and institutions via interlocking membership of journal editorial review boards.

In academia, many researchers have studied the intellectual structure of their fields and disciplines; and such studies appear to be carried out more frequently as fields mature and research styles become more reflexive. Often researchers analyse the content of academic journals to establish how knowledge in a particular academic domain is partitioned and connected. Past approaches have included subjective classification of journal content, citation/co-citation analysis (CCA) (Cawkell, 2000) and more recently forms of co-word analysis, e.g. latent semantic analysis (LSA) (Larsen et al., 2008). These studies select their base data from various sources including: article content, authorship details and citations. Recent examples within OM include Pilkington and Meredith (2009) who used CCA to study article content of three OM journals over 30 years while Kulkarni et al. (2011) used LSA to identify the major topics and methods in IJOPM articles over a thirty year period.

Recently Burgess and Shaw (2010) introduced a new approach to studying academic communities by applying SNA to editorial review board data to examine how journal governance connects to intellectual structure; in contrast to previous studies that focused on structures derived from journal content and authorship data. Their study examined the links between the main academic fields comprising management and business, whereas here it is applied to the links between sub-fields in a single academic field (OM).

Next the methodology is described and then results are presented. A discussion follows and then some concluding remarks complete the paper.

Methodology

The study sample comprises the journals listed under the category of Operations and Technology Management in version 4 of the Academic Journal Quality Guide of the Association of Business Schools (ABS, 2010). Although 40 journals are listed, the sample reduces to 38 since two are duplicated under different names (see Appendix for full list of journals included in the study). The main data have been collected with details of the journal's editorial review board members extracted from the journals' websites, cross-checked against and updated from institutional and personal websites, and consolidated into Excel. This overall database was checked and three two-mode data files extracted from the Excel spreadsheet and imported into UCINET (Borgatti et al., 1999) for analysis as one-mode data (journals, academics and institutions) and visualisation in NETDRAW. The more detailed analysis methods are covered in the results.

Results

The data for the 38 journals comprised 1,902 editorial review board memberships that were occupied by 1,534 individuals in 708 organisations located in 59 countries. Over 87% of the memberships were occupied by males, the majority of occupants (i.e. over 93%) were located in universities or similar higher education institutions, 57% were affiliated to business schools and 46% were affiliated to organisations located in the USA. On average a journal editorial review board comprised 50 members with the number varying from 20 to 177 (see Table 1). Journals had been in existence for 27 years on average and the mean ABS rank was 2.

Table 1Characteristics of editorial review boards for individual journals

Jnl code	Group	Mem-bers	Deg-ree	Bet-ween-ness	% Male	% Bus Schl	% Univ	% USA	ABS	Age (yrs)
CIE	C&P	55	10	14.2	96.4	12.7	94.5	47.3	2	36
IJCIM	C&P	48	13	5.2	91.7	10.4	89.6	25.0	2	25
IJPE	C&P	57	17	25.4	98.0	45.3	96.5	31.6	3	23
IJPR	C&P	41	19	31.6	87.8	41.5	100.0	29.3	3	51
PPC	C&P	56	18	31.7	94.6	28.6	94.6	25.0	3	22
IJLM	L&S	52	10	4.7	88.5	86.5	98.1	59.6	2	22
IJLRA	L&S	39	8	4.1	87.2	55.3	89.7	10.3	2	15
IJPDLM	L&S	90	15	17.9	76.4	85.2	100.0	46.7	2	42
JBL	L&S	156	15	81.3	85.3	88.5	96.2	88.5	2	33
JOM	L&S	177	23	50.8	82.8	78.5	99.4	68.9	4	32
JPSM	L&S	65	15	63.6	86.2	81.3	100.0	26.2	2	18
JSCM	L&S	52	11	6.6	78.8	92.3	100.0	80.8	1	48
SCM	L&S	38	19	21.4	89.5	68.4	92.1	34.2	3	16
HCI	M	23	0	0	87.0	4.3	69.6	78.3	1	26
IJTM	M	23	0	0	100.0	13.0	34.8	30.4	2	26
IJTMSD	M	25	1	0	84.0	20.8	92.0	12.0	1	10
JPA	M	54	1	0	88.7	59.3	94.4	46.3	2	23
MSQ	M	36	4	0	69.4	83.3	100.0	36.1	1	21
PIME	M	29	8	1.9	93.1	3.4	100.0	13.8	1	29
RESS	M	47	2	0.5	93.6	4.3	74.5	38.3	3	26
IJASM	OP&S	31	15	9.3	96.7	16.1	96.8	9.7	1	6
IJBPM	OP&S	42	17	36.1	92.9	40.5	88.1	7.1	1	14
IJOPM	OP&S	40	14	6.0	82.5	80.0	100.0	20.0	3	32
IJPPM	OP&S	21	13	7.2	71.4	52.4	85.7	14.3	1	61
JMTM	OP&S	30	16	7.5	85.7	50.0	100.0	16.7	2	23
IEEETEM	P&EM	116	9	29.0	78.4	78.9	99.1	69.8	3	58
IJPM	P&EM	34	5	5.5	91.2	55.9	97.1	17.6	2	30
JCEM	P&EM	42	3	0	88.1	2.4	100.0	73.8	2	29
PMJ	P&EM	43	6	11.2	90.7	41.5	69.0	58.1	2	43
BMK	Q&P	26	12	2.6	96.2	76.9	88.5	57.7	1	18
BPMJ	Q&P	55	13	5.4	96.4	54.5	92.7	27.3	1	17
IJQRM	Q&P	28	17	14.7	100.0	59.3	92.9	21.4	2	29
KPM	Q&P	45	7	0.5	82.2	35.6	50.0	28.9	1	19
TQMBE	Q&P	30	14	18.0	96.7	32.1	80.0	13.3	2	22
JFMS	S&M	37	3	2.3	83.8	24.3	100.0	2.7	2	28
JOS	S&M	40	6	11.8	97.5	20.0	97.5	25.0	3	15
MSOM	S&M	59	3	0.9	84.7	91.5	100.0	84.7	3	14
POM	S&M	20	8	10.3	85.0	95.0	100.0	95.0	3	21

Figure 1 shows the sociogram for the journal network where the link connecting two journals represents at least one person who sits on both editorial review boards. The shape of the journal node, and its colour, represents its ABS rank. Diamond (grey) is the highest rank of 4* which applies to one journal (JOM) that is at the centre of the network. Triangle (black) is 3*, square (blue) – 2* and circle (red) – 1*. In general the higher the ABS rank then the more central the journal is positioned in the network. Two journals are not connected to the network HCI and IJTM (isolates) while two more journals are "pendants", i.e. each only connects to one other journal (JPA and IJTMSD).
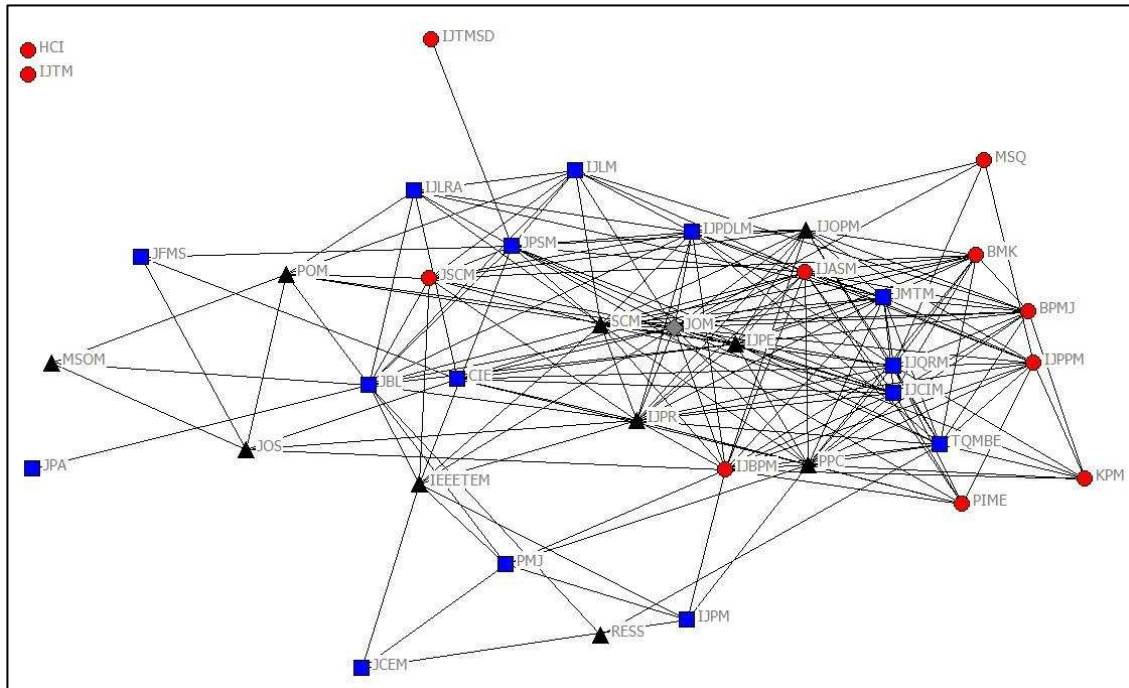
Figure 1 Journal network

The OM journals were grouped into communities (sub-fields) based on a hierarchical cluster analysis and a multi-dimensional scaling (MDS) plot assisted by the author's views, grounded in their experience of the field, of what might comprise intuitive groupings. Figure 2 shows the MDS plot with the six main communities that were identified superimposed on the diagram. A seventh group of miscellaneous journals that did not fit in the other six groups are not fully shown on Figure 2 since a number are outliers on the MDS plot. The six communities were named to reflect the composition of the groups: (i) computers & production, (ii) logistics & supply, (iii) operations, performance & systems, (iv) project & engineering management, (v) quality & process and (vi) services & manufacturing. Table 1 shows the allocations of the individual journals to their community groups (M stands for miscellaneous) while Table 2 shows the journal characteristics aggregated against these community groups. Some comments are now made against each of the groups.

Table 2 Characteristics of journal editorial review boards for community groups

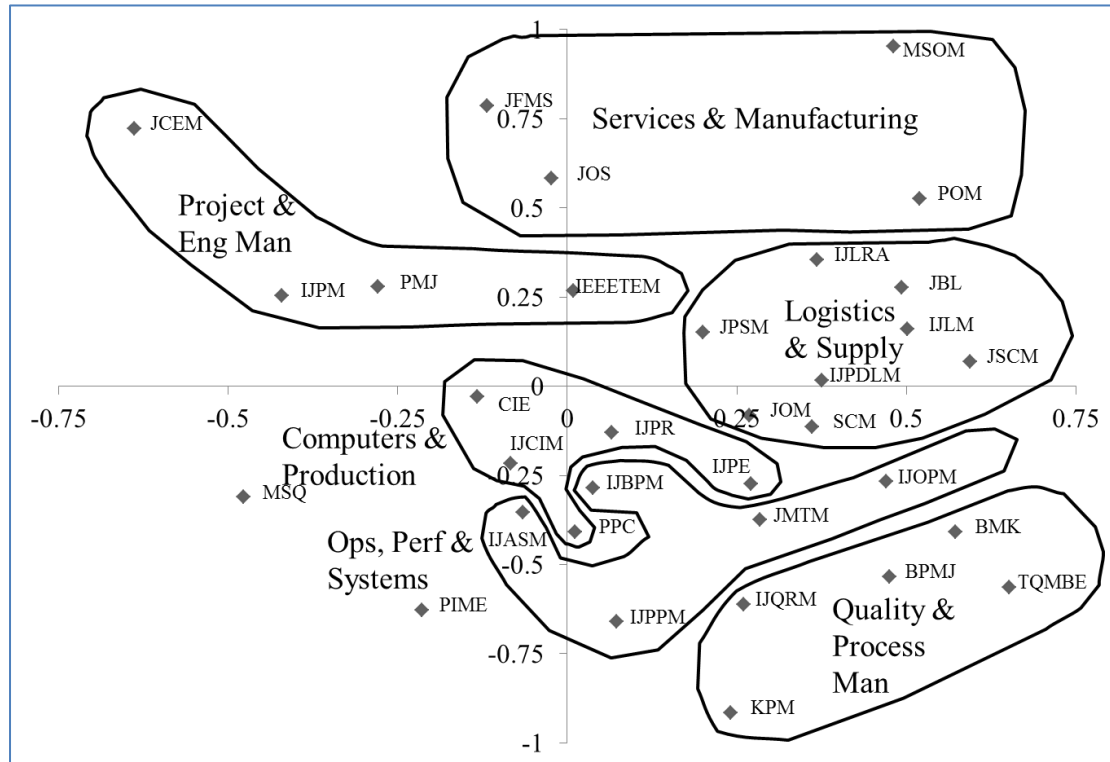| Group	No	Members	Degree	Between-ess	% Male	% Bus Schl	% Univ	% USA	ABS	Age (yrs)
C&P	5	51.4	15.4	21.6	94.0	27.3	94.9	31.9	2.60	31.4
L&S	8	83.6	14.5	31.3	83.6	81.8	97.8	61.1	2.25	28.2
M	7	33.9	2.3	0.3	87.7	31.4	83.5	37.1	1.57	23.0
OP&S	5	32.8	15.0	13.2	87.0	48.8	94.5	13.4	1.60	27.2
P&EM	4	58.8	5.8	11.4	84.3	55.0	93.6	60.8	2.25	40.0
Q&P	5	36.8	12.6	8.2	93.5	50.3	79.8	28.8	1.40	21.0
S&M	4	39.0	5.0	6.3	87.8	57.7	99.4	51.3	2.75	19.5
Mean	5.4	50.0	10.3	14.2	87.2	56.9	93.2	46.1	2.03	26.9

Figure 2 Multi-dimensional scaling plot of journals showing community groups

Computers & production

This group of five journals (CIE, IJCIM, IJPE, IJPR and PPC) has a high average ABS rank, substantially-sized boards and the highest degree of the communities, i.e. it is the group containing journals with the highest number of connections with other journals. It has the highest percentage male membership. Review board members in this group tend not to be affiliated to business schools and tend not to be drawn from USA-based institutions.

Logistics & supply

This is the largest community containing eight journals (IJLM, IJLRA, IJPDLM, JBL, JOM, JPSM, JSCM and SCM). The ABS rank is higher than the average for the overall network. Journals in this group have the highest number of board members compared to other journals. This group has the highest proportion of members affiliated to business schools and to USA-based institutions. The group has one of the highest levels of connectedness within the network on the basis of degree and has the highest level of betweeness, i.e. the journals are not only at the centre of the network, but have a strong role as intermediaries that link other journals together.

Operations, performance & systems

The five journals in this group (IJASM, IJBPM, IJOPM, IJPPM and JMTM) have the lowest mean number of members per journal. The group has a below average ABS rank, and members with a below average affiliation to business schools and the lowest affiliation to USA-based institutions. On centrality the group has some high measures showing the journals occupy a central position in the network.

Project & engineering management
This small group contains four journals (IEEETEM, IJPM, JCEM and PMJ) that are above average size on number of editorial board members per journal and above average on ABS score. The group contains the longest established journals and has one of the highest membership affiliations to USA institutions. The community has low centrality scores.

Quality & process
The five journals in this community (BMK, BPMJ, IJQRM, KPM and TQMBE) are below average in size as measured by mean members per journal and they have the lowest mean ABS rank of the groups. The community has the highest non-university affiliation, although there is still a high percentage of university affiliation. The membership affiliation to USA-based institutions is one of the lowest of the communities. The centrality scores are about average for the communities.

Services & manufacturing
Four journals (JFMS, JOS, MSOM and POM) comprise this community. The group has the highest ABS rank of the communities and contains the "youngest" set of journals but the low centrality scores indicate they are located toward the periphery of the network.

Miscellaneous
The seven journals forming this community (HCI, IJTM, IJTMSD, JPA, MSQ, PIME and RESS) have a low ABS score, a low membership number per journal, low affiliation to business schools, and low affiliation to USA-based organisations. The group has the lowest set of centrality scores indicating their location at the edge of the network. As commented earlier the journals in this group include ones that are disconnected from the network and ones that are connected to only one other journal.

Other features of the data set
In addition to the grouping of journals various other features shed light on the influence of various interest groups. These are presented in this section. Table 3 shows the dominant position of members drawn from USA-based organisations. The table also indicates the dominance of the English-speaking countries of the world.

Table 3 Top 10 membership affiliations by country

Country	No of memberships	Percentage of total	Rank
USA	877	46.1	1
UK	263	13.8	2
Canada	70	3.7	3
Australia	66	3.5	4
China	65	3.4	5
Germany	44	2.3	6
Netherlands	42	2.2	7
Sweden	39	2.0	8
Singapore	35	1.8	9
Italy	35	1.8	10

Table 4 also reflects this dominance by showing the top ten organisations based on number of editorial memberships they have within the OM journals. Table 5 shows the

distribution of review board memberships to individual academics. The vast majority of individuals (86.7%) only have one place on an editorial review board, while a very limited number have five or more memberships.

Table 4 Top 10 membership affiliations by organisation

Organisation	Country	Number of memberships	Percentage of total	Rank
Arizona State University	USA	35	1.84	1
Michigan State University	USA	33	1.74	2
Ohio State University	USA	32	1.69	3
National University of Singapore	Singapore	26	1.37	4
Pennsylvania State University	USA	21	1.11	5
University of Tennessee at Knoxville	USA	19	1.00	6
University of Manchester	UK	17	0.90	7=
University of Texas	USA	17	0.90	7=
University of California	USA	17	0.90	7=
Georgia Institute of Technology	USA	17	0.90	7=

Table 5 Distribution of editorial review board memberships to individuals

Number of memberships	1	2	3	4	5	6	7	8	9	Total
Number of individuals	1650	181	46	15	6	2	0	0	2	1902
Percentage	86.7	9.5	2.42	0.79	0.32	0.11	0	0	0.11	

Discussion

Some aspects of the analysis are not as strong as others. For example, the S&M community appears more like the amalgamation of two small sub-groups – one containing the business school- and USA-affiliated journals MSOM and POM, and JFMS and JOS that are affiliated to non-business school and non-USA-based institutions. Conversely the C&P and OP&S communities, despite their difference in ABS scores, form a larger meta-community group that could be taken as the conventional core of the OM field.

The L&S journals form what seems to be a formidable grouping with what appears to be an unusual member of the group, JOM, the only 4* ABS ranked journal in the whole 38 journal set which helps to lift the mean score for the L&S community. The strength of connection between the journals forming this community becomes more apparent with the analyses illustrated by Figures 3 and 4. Figure 3 shows the connections between the whole set of 38 journals for those with a high strength of tie. To be specific the figure shows those journals that have more than 11 individuals in common between any two journals. Five of the journals displaying high degree of overlaps between board memberships are in the L&S group, e.g. the same 42 individuals feature on the review boards of both JBL and IJPDLM. A further feature of Figure 3 is the centrality of JBL which conveys its important brokerage position although it is not highly ranked by the ABS (2). Figure 3 also points to why JOM is included within the L&S group, namely its overlapping board memberships with JBL and JSCM.

Figure 4 shows a two-mode sociogram of board members connected to journals for those board members who have four or more board memberships. At the top centre of the figure is a cluster of six of the L&S group (IJLM, IJPDLM, JBL, JPSM, JSCM and SCM) surrounded by ten individuals who are linked through review board membership

to at least four out of the six journals. The two L&S journals missing from this group are (i) IJLRA which does not feature at all in the diagram and (ii) JOM which is positioned toward the bottom right of the figure to connect with three individuals who also have board memberships with IEEETEM. At the bottom left are two individuals who link to SCM, IJCIM, JMTM and IJASM.
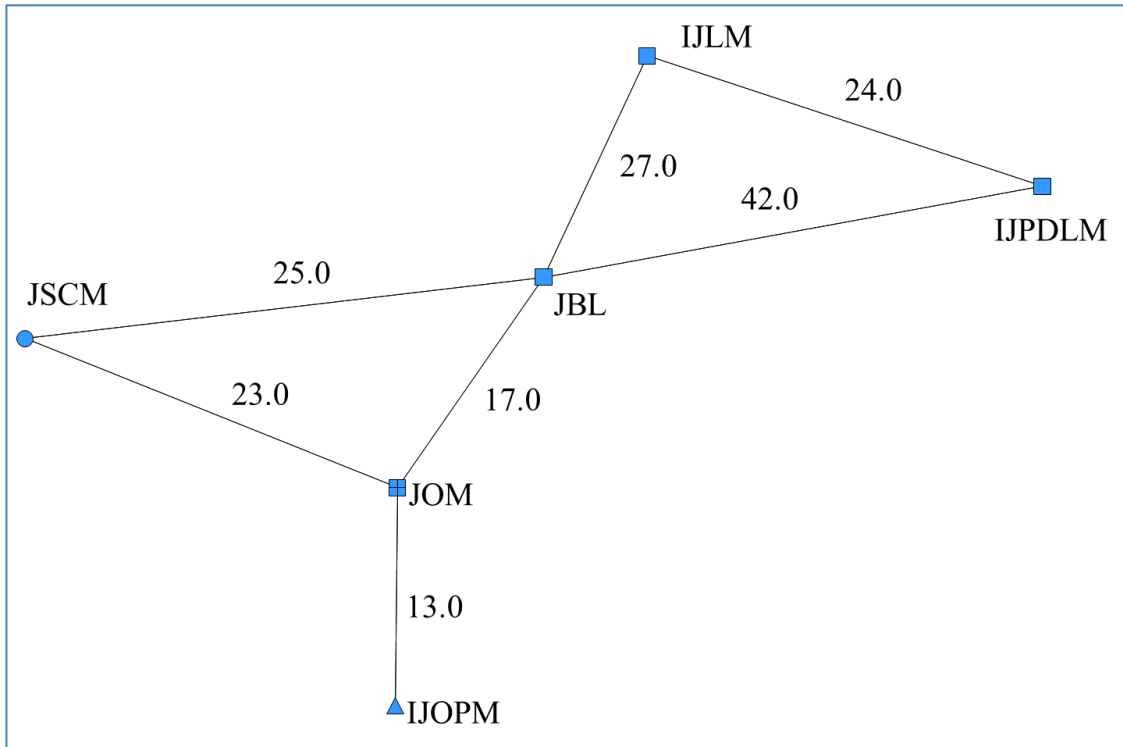

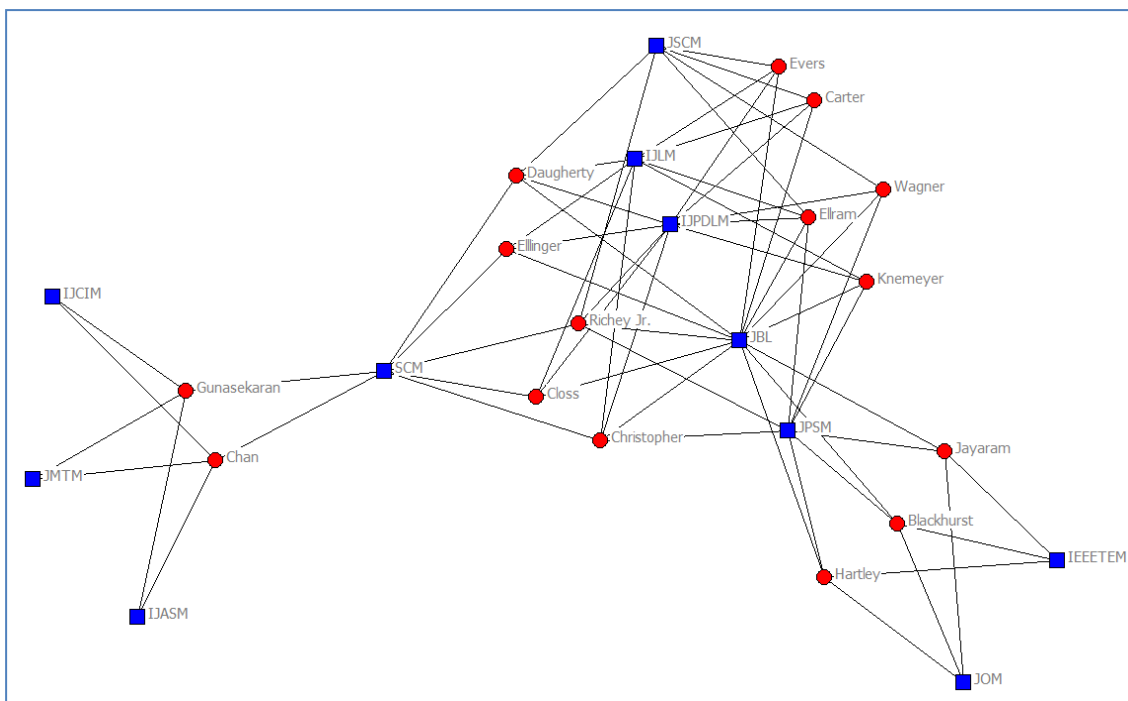Figure 3 Analysis for high strength of tie (greater than 11)

Figure 4 Two mode analysis of journals and board members for those with four or more board memberships

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Conclusion

Our aim was to contribute to better understanding of how the OM academic community relates to various interest areas by addressing the stated research question. We believe we have done so by showing how the characteristics of operations management journals and their editorial review boards reflect the various interest groups within the field. We employed a novel approach of analyzing the social networks of editorial review boards of OM journals as constructed from data that we collected from the web. The dominance of male editorial board members affiliated to business school and USA-located institutions have been demonstrated. We have identified various journal groupings that potentially mark out academic communities within operations management. In particular we have demonstrated what appears to be a particularly influential community of logistics and supply chain academics within the operations management field. The community associates with a group of journals that are strongly linked by editorial review board interlocks. Overall we believe we have shed some light on the interests that OM academics serve. However, we accept that there are limitations to our study, as with any research. Inferring social connections from web-based editorial review board data may be criticized by some, however we believe it to be an acceptable technique to add to other approaches. While the purpose of editorial review boards may be debated, it is difficult to deny that their existence is a substantial social phenomenon that tells us something about the academic community. In our opinion the immediacy of data checking afforded by the internet ensures that we based our study on a quality data set which runs contrary to the view that web sources tend to be of suspect value. Further analysis is ongoing and hopefully will shed additional light on the OM field.

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Appendix

Table 6 List of journals included in the study

Code	Journal Name
BMK	Benchmarking
BPMJ	Business Process Management Journal
CIE	Computers and Industrial Engineering
HCI	Human-Computer Interaction
IEEETEM	IEEE Transactions on Engineering Management
IJASM	International Journal of Agile Systems and Management
IJBPM	International Journal of Business Performance Management
IJCIM	International Journal of Computer Integrated Manufacturing
IJLM	International Journal of Logistics Management
IJLRA	International Journal of Logistics: Research and Applications
IJOPM	International Journal of Operations and Production Management
IJPDLM	International Journal of Physical Distribution and Logistics Management
IJPE	International Journal of Production Economics
IJPM	International Journal of Project Management
IJPPM	International Journal of Productivity and Performance Management
IJPR	International Journal of Production Research
IJQRM	International Journal of Quality and Reliability Management
IJTM	International Journal of Technology Management
IJTMSD	International Journal of Technology Management and Sustainable Development
JBL	Journal of Business Logistics
JCEM	Journal of Construction Engineering and Management
JFMS	Journal of Flexible Services and Manufacturing
JMTM	Journal of Manufacturing Technology Management
JOM	Journal of Operations Management
JOS	Journal of Scheduling
JPA	Journal of Productivity Analysis
JPSM	Journal of Purchasing and Supply Management
JSCM	Journal of Supply Chain Management
KPM	Knowledge and Process Management
MSOM	Manufacturing and Service Operations Management
MSQ	Managing Service Quality
PIME	Proceedings of Institute of Mechanical Engineers Part B: Journal of Engineering Manufacture
PMJ	Project Management Journal
POM	Production and Operations Management
PPC	Production Planning and Control
RESS	Reliability Engineering and System Safety
SCM	Supply Chain Management
TQMBE	Total Quality Management and Business Excellence