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A social network analysis of the co-authorship network of the Australasian Conference of Information Systems from 1990 to 2006

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A SOCIAL NETWORK ANALYSIS OF THE CO-AUTHORSHIP NETWORK OF THE AUSTRALASIAN CONFERENCE OF INFORMATION SYSTEMS FROM 1990 TO 2006

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Abstract

Using bibliographic data extracted from an Endnote database, social network analysis techniques were used to generate and analyse a network of co-authors with the aim of developing an understanding of the research community that produces the research knowledge published by the Australasian Conference on Information Systems (ACIS). The ACIS community was found to be a healthy small-world community that kept evolving in order to provide an environment that supports collaboration and sharing of ideas between researchers. It was also found that, unlike a similar analysis of the European Conference (ECIS), the Australasian scene was not dominated by a couple of key researchers as quite a significant number of popular researchers were identified.

Keywords: social network analysis, Information Systems discipline, co-authorship, collaboration

1 INTRODUCTION

Interaction between researchers is well known to be the essence of research practice. Researchers interact not only to communicate research activities but also to collaborate with each other to co-produce research and co-author research results (Melin & Persson 1996). Since collaboration has the potential to promote research activity, productivity and impact, it should be encouraged, supported and monitored. Although it has been argued that co-authorship is no more than a partial indicator of collaboration, Laudel (2002) found that a major part of collaboration is not acknowledged as co-authors. Several studies (for instance, Patel 1973) have shown that there is a positive correlation between collaboration and co-authorship. In fact, co-authorship is one of the most tangible and documented forms of research collaboration (Glänzel & Schubert 2004).

A co-authorship network is a social network consisting of a collection of researchers each of whom is connected to one or more other researchers if they have co-authored one or more papers. This is based on the reasonable assumption that researchers who co-author a paper are acquainted with each other, although there are many researchers who know each other quite well but have never written a paper together. Such a network can be represented as a set of nodes (or vertices) denoting co-authors joined by edges (or links) denoting research acquaintance.

Social Network Analysis (SNA) is a sociological approach for analysing patterns of relationships and interactions between social actors in order to discover underlying social structure such as: central nodes that act as hubs, leaders or gatekeepers; highly connected groups; and patterns of interactions between groups (Wasserman & Faust 1994). SNA has been used to study social interaction in a wide range of domains. Examples include: collaboration networks (Newman 2001a), directors of companies (Davis & Greve 1997; Davis, Yoo & Baker 2003), organisational behaviour (Borgatti & Foster 2003), inter-organisational relations (Stuart 1998), computer-mediated communications (Garton, Haythornthwaite & Wellman 1999), and many others.

In this study, we propose to use SNA to study the community of researchers who publish their papers in the Australasian Conference of Information Systems (ACIS) in order to reveal interesting patterns and features within this academic community. With the help of SNA, we hope to develop an understanding of the research community that produces the research knowledge published by ACIS by answering the following- Is the network a random structure or does it display recognisable properties? Is the community highly clustered around a few high profile researchers or is influence spread among a number of researchers? Who are the influential members of this community? What are the weaknesses or strengths of this network?

Clarke (2008) has recently completed a retrospective review of the Information Systems discipline in Australia based on new research and revisiting the work of Culnan (1986; 1987), Land (1992), Barki et al. (1993), Avgerou (1999), Pervan and Cecez-Kecmanovic (2001), Galliers and Whitley (2002) and Banker and Kauffman (2004). He notes that IS emerged as a discipline in the 1960s in Australia, formally from the old Caulfield Institute of Technology (now embedded within Monash University) and has grown now to a community of some 700 with explosive development from the 1970s onwards. Clarke notes further that "the emergence of the IS discipline was in historical terms brisk, but to an observer at the time would have appeared laboured and wayward". However, by the end of the 1980s all but the two oldest universities (Melbourne and Sydney) had specialist organisational units in IS. What is clear from this research and others reported in a newly edited book by Gable et al. (2008) on the Information Systems discipline in Australia is that the discipline and its associated conference (ACIS) has grown significantly reaching its peak after 2000 and which subsequently has generally shown a decline in research output, student graduates and student demand, albeit at a time of skills shortages in IT in Australia generally. The ACIS conference emerged in 1990 as a response to the growth in research activity in Australian universities.

2 RELATED WORK

The idea of studying research collaboration patterns using bibliographic data is not new as there is a substantial body of literature in Information Science dealing with co-authorship patterns (Crane 1972; Persson & Beckmann 1995; van Raan 1990). Using co-authorship networks to study collaboration patterns between researchers is also not a new idea since with the availability of large bibliographic databases, it is relatively easy to construct large social networks with high reliability. These networks are true social networks, in the sense that it is very likely that two authors who write a paper together are acquainted with each other (Newman & Park 2003).

Scientific collaboration networks were studied for three disciplines, namely: physics, biomedical research and computer science using bibliographic data from four databases for the period 1995-1999 (Newman 2001b). In all three networks, a giant component of researchers was found to exist in which there is only a short path of intermediate acquaintances between any two researchers, hence all networks studied displayed the "small world" property. Some differences found between the disciplines studied were: (1) on average, researchers from experimental disciplines have larger number of collaborators than those from theoretical disciplines (largest average number of collaborators found in high-energy physics), and (2) the degree of network clustering is much lower in biomedicine than in the other disciplines (indicating less social organization in biomedicine). A similar study was performed for the disciplines of mathematics and neuro-science using bibliographic records from an electronic database for the eight-year period from 1991 to 1998 (Barabási et al. 2002).

Research collaboration within the Information Systems discipline has also been studied as social network analysis has been performed for both the International Conference on Information Systems (ICIS) (Xu & Chau 2006) and the European Conference on Information Systems (ECIS) (Vidgen, Henneberg & Naudé 2007). Social network analysis of ICIS was conducted using bibliographic data for the period 1980 to 2005 available from the Association of Information Systems to study the social identity of the discipline (Xu & Chau 2006). Among other things, results showed that: (1) the community of international IS researchers is well connected and they frequently interact with each other, (2) there exists a giant component of well-connected and most productive authors, and (3) the network has evolved healthily over time with the addition of new members and the improved connection among members.

The ECIS analysis was performed using bibliographic data from an Endnote database available from the London School of Economics for the period 1993 to 2005 (Vidgen, Henneberg & Naudé 2007). Research contributions were separated into research papers and panels and two networks were generated and analysed. While the panel network displayed small world properties, unlike other collaboration networks, the co-authorship network displayed only a few "small world" properties and hence a lesser sense of social cohesion than would be expected. Although social network analysis of the Information System discipline has been performed at the international and European levels, to the best of our knowledge, it has not been attempted for the Australasian scene yet, other than a study of frequency of publication locations by Australian authors in IS by Sellitto (2007), hence the motivation for the present work.

3 METHODOLOGY

Social network analysis (SNA) has emerged as a key technique in the social and behavioural sciences as well as in other major disciplines (Wasserman & Faust 1994). The main focus of SNA is on the relationships among social entities (e.g. communications among members of a group) and it makes use of a variety of statistical and visual analyses to achieve this. Although, social networks were initially studied in the social sciences, such studies were restricted to rather small systems viewing these networks as static graphs consisting of nodes representing individuals and links representing various quantifiable social interactions. In contrast, recent approaches rooted in statistical physics focus more on large networks searching for universalities both in the topology of the network and in the dynamics governing its evolution (Barabási et al. 2002).

Recently, SNA has been increasingly used as a structured way to analyse the extent of informal relationships (among people, teams, departments, or even organisations) within various formally defined groups (Cross et al. 2001). SNA makes visible these otherwise invisible patterns of interaction, to identify important groups in order to facilitate effective collaboration (Cross, Borgatti & Parker 2003). Thus, SNA helps to identify and assess the health of strategically important networks in an organisation. In the context of this study, we are using SNA to gain an understanding of the nodes (co-authors) and relationships (those who wrote a paper together) in the co-authorship network. Clearly, there are many different metrics that can be used to assess such networks. At an aggregate level, we will analyse the network as a whole in order to identify important major groups or components within the community of researchers, and for the giant or core component we will use measures that can give an indication of the productivity of the network (i.e. density of the network), speed of communication within the network (diameter of the network), etc. At a lower level, we will analyse the nodes of the network using several measures of centrality to find out who the most popular and influential researchers are within the ACIS community.

4 DATA COLLECTION AND PROCESSING

The bibliometric data used in this study is based on bibliographic data extracted from an Endnote database available from the ISWorld Net Research and Scholarship page[1] of the Association for Information Systems. The Endnote database contained all research papers published by ACIS from 1990 to 2006.

The contents of the Endnote database were exported in XML format in order to facilitate further processing. Since we are only interested in co-authored publications, all papers written by single authors were ignored. This was achieved by writing a small Java program to extract a list of co-authors on a paper-by-paper basis. Another custom-written Java program was then used to convert this list of authors into a network file to the DL format which is readable by UCINet (Borgatti, Everett & Freeman 2002), the software used for most of the social network analysis in this study. Apart from generating the DL file, the Java utility was programmed to output a list of authors sorted in alphabetical order which was visually inspected to discover typographical errors (e.g. Peta Dark instead of Peta Darke) and inconsistencies in authors' names, especially those with middle initials who used them part of the time (e.g. Brian Corbitt instead of Brian J. Corbitt) and those with aliases (e.g. Kit Dampney instead of C. N. G. (Kit) Dampney). A more subtle typographical error was the use of a left apostrophe instead of a right apostrophe (e.g. Paul O`Brien instead of Paul O'Brien) in the Endnote database. Data cleaning was a highly iterative activity and consumed a large part of the data processing activities. Once the co-authorship data was in UCINet's DL format, various statistical analyses were performed using UCINet at network and co-author levels and the results of these analyses are reported and discussed in the following sections. Visualisation of the co-authorship network (or parts of the network) was performed using Pajek (Batagelj & Mrvar 1998), another popular SNA software.

5 NETWORK ANALYSIS

Recent analysis by Gable (2008) shows that at the ACIS conference ten universities (Monash, Melbourne, Edith Cowan, Curtin, Deakin, QUT, Wollongong, UNSW, Tasmania and Victoria) have contributed the vast majority of papers. This paper reports on the broader perspective of the people involved as a number of key people have moved from one university to another as universities try to shore up quality and buy expertise to strengthen or develop existing or new departments. Table 1

[1] http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=395

shows the evolution of the ACIS community during the period 1990 to 2006. The cumulative number of papers presented at the conference grew from 15 in 1990 to 1333 in 2006 while the cumulative number of co-authored papers grew from nine to 820 during that time frame. As of 2006, the percentage of co-authored papers represents 69% of the total number of papers.

The *size* of a social network is denoted by the number of actors or nodes (co-authors in this case) and it gives an indication of the likelihood of interaction between nodes; the bigger the network, the greater the likelihood of interaction between co-authors. However, the bigger the network, the more difficult it becomes for everyone to be connected with each other and when the network is not fully connected, it contains a number of sub-networks (called components) for which there are no paths between nodes from one sub-network to another sub-network. The number of co-authors in the ACIS network grew from 19 in 1990 to 1256 in 2006 while the number of co-authors in the *main component* (the largest sub-network in which there is a path from a co-author to any other co-author) grew from three in 1990 to 587 in 2006. As of 2006, the percentage of co-authors in the main component represents 46% of the total number of co-authors. It should be noted that the main component is not a fully-connected network (i.e. everyone is not connected to everyone). The degree of connectedness of a network (or sub-network) is given by the *density* measure, which is the percentage of the number of actual connections over the total number of possible connections. The density of the main component dropped from 33.33 % in 1990 to 0.24% in 2006.

Another interesting feature of a network is an indication of the amount of time for a communication to pass through the network. A commonly-used measure is the *diameter* of the network; the shorter the diameter, the faster the diffusion of communications. The diameter of a network is measured by the longest geodesic distance in the network with the geodesic distance being the shortest path (in terms of number of links or connections) between any two nodes. So far, the diameter of the network has grown to 9, slightly more than what would be expected from a “small-world” network. One of the main characteristics of a small-world is the so-called “Six Degrees of Separation” phenomenon in which it is claimed that everybody on the planet is separated by only six other people (Milgram 1967; Watts 1999).

The structure of the ACIS network of co-authors displays small world properties because co-authors are well-connected, and are close to each other. Hence, information and knowledge can be transferred effectively in the network, although in practice the flow of information might be different from the established formal network structure, and is thus acknowledged as a limitation of the study (Cross, Borgatti & Parker 2002).

Table 1: Evolution of ACIS community (1990-2006)

Year	# Papers (cumulative)	# Co-authored papers (cumulative)	# Actors in co-authorship network	# Actors in main component	Density of main component	Diameter of main component
1990	15	9	19	3	0.3333	1
1991	44	24	48	4	0.2500	1
1992	89	40	84	4	0.2500	2
1993	149	69	142	5	0.2000	1
1994	205	104	209	8	0.1429	2
1995	268	144	264	13	0.0962	2
1996	340	179	324	13	0.0962	2
1997	401	216	372	25	0.0617	3
1998	461	259	420	29	0.0505	2
1999	563	330	516	51	0.0263	4
2000	657	405	628	110	0.0123	5
2001	741	462	694	170	0.0077	5
2002	845	543	795	170	0.0077	5
2003	991	660	940	273	0.0046	7
2004	1111	758	1058	410	0.0033	8
2005	1223	837	1146	467	0.0030	9
2006	1333	920	1256	587	0.0024	9

In order to give an idea of the evolution of the ACIS co-authorship in time, cumulative networks were drawn from 1990 to 2005 and assembled in Figure 1. Since the main component was rather small in the early years (1990-1994), the first four pictures show the complete network (with the main component in the middle of the network) while the rest of the pictures (1995-2005) show only the main component. It can be seen that the main component started to become significant around the year 2000.

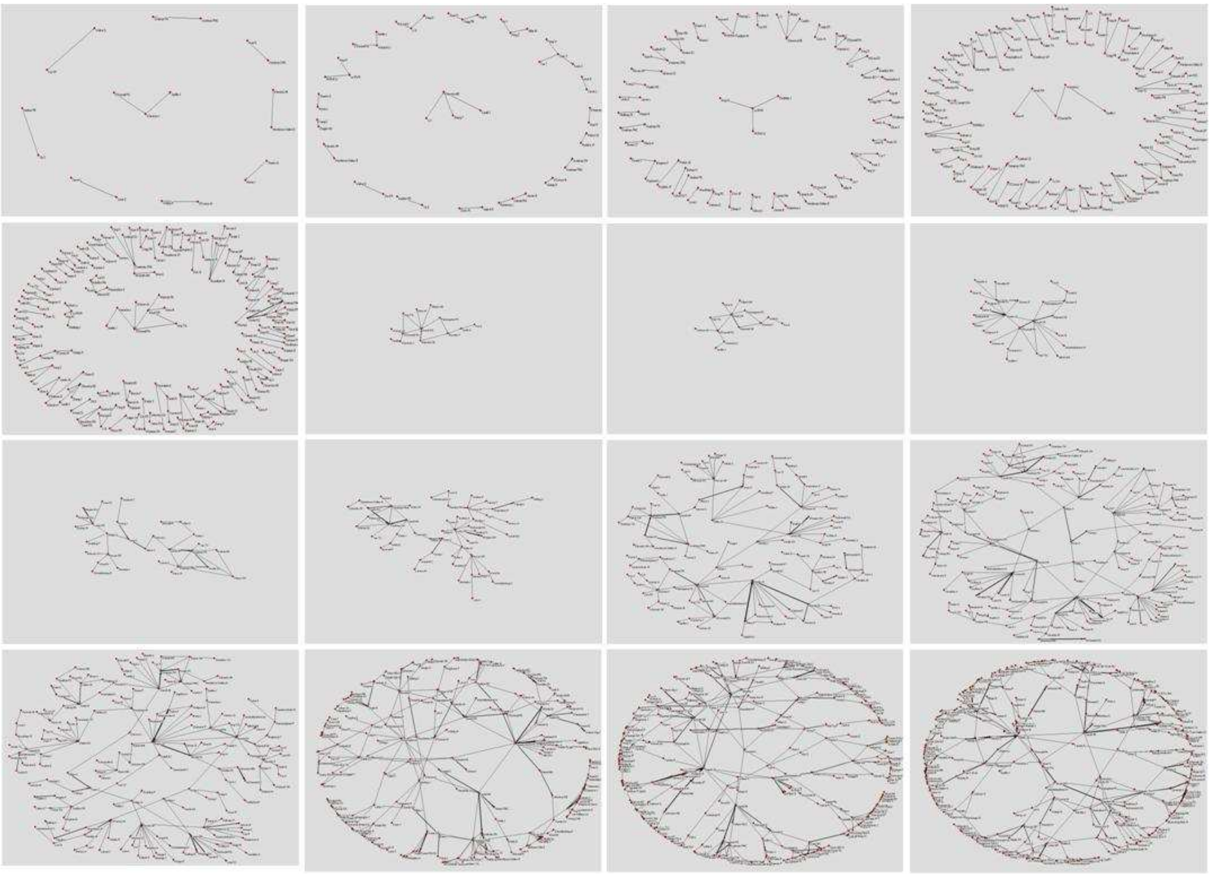

Figure 1: ACIS Network evolution (1990-2005)

The state of the ACIS network in 2006 (most current at the time of writing) represented using its main component is shown in Figure 2. We chose to represent the co-authorship network as a directed network i.e. directed links from the main author to his/her co-authors. The thickness of the links gives an indication of the number of co-authored papers between a main author and the particular co-author. Although the network shows the high popularity of certain individuals (e.g. Graeme Shanks), it also shows that the scene is not dominated by a few individuals as there is quite a range of well-connected individuals. A more detailed analysis of popular individuals follows in the next section.

6 EGO ANALYSIS

After having analysed the characteristics of the ACIS network as an entity, we now analyse it in terms of the individual actors or "egos" that make up the nodes of the network. More specifically, co-authors are analysed in terms of their *centrality* in the ACIS network. The idea of centrality of individuals was one of the earliest used by social network analysts and the origins of this idea can be found in the sociometric concept of the *star* i.e. the most popular person or the person at the centre of attention (Scott 2007). Thus, a central actor is one at the centre of a number of connections i.e. an actor with a large number of direct links with other actors.

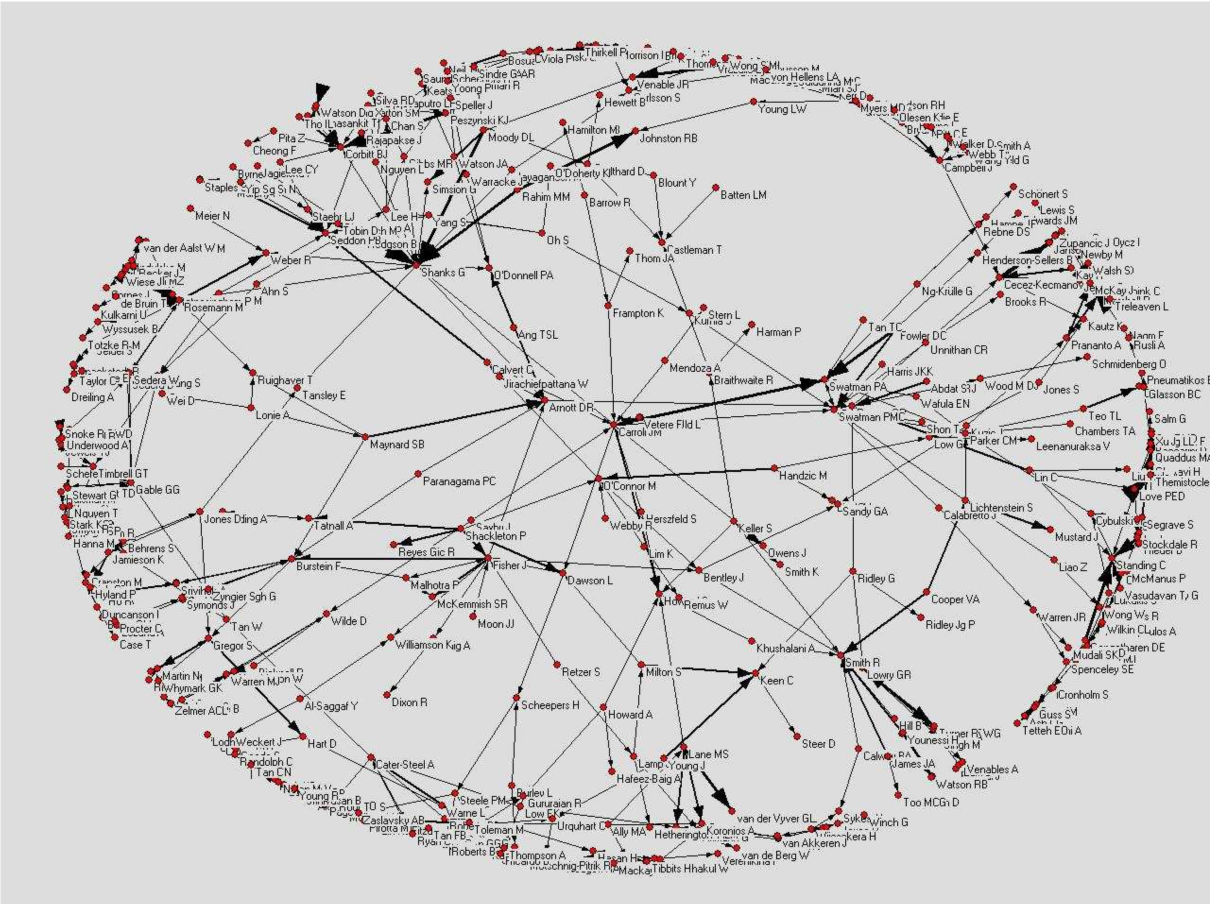

Figure 2: Main component sub-network

Centrality is measured by the *degree* of the various nodes in the network, with degree representing the number of other nodes to which a node is adjacent. This measure of centrality is known as *local centrality* since indirect connections to the particular node are ignored. Thus, the notion of centrality has been extended to *global centrality* (Freeman 1979) to include the distant connections of the nodes. This is measured by the *closeness* of the nodes to other nodes expressed in terms of the distances among the various nodes. *Betweenness* (Freeman 1979) is another centrality measure which measures the extent to which a particular node lies between the various other nodes of the network. A node of relatively low degree may play an important intermediary node (e.g. broker, gatekeeper, etc) and hence be a central node in the network. *Eigenvector* (Bonacich 1972) is another measure of centrality proposed based on the belief that the centrality of a particular node cannot be assessed in isolation from the centrality of all the other nodes to which it is connected. Centrality scores are assigned to nodes based on the principle that connections to high-score nodes contribute more to the score of the particular node than connections to low-score nodes.

The term *structural hole* was coined by Burt (1992) to refer to some important aspects of positional advantage (or disadvantage) of actors in a network. He developed a number of measures to explain how and why the ways actors are connected affect their constraints and opportunities and hence their behaviour. Table 2 shows the top 30 actors ranked on the centrality measures previously discussed, namely: (1) degree, (2) betweeness, (3) closeness, (4) eigenvector (5) and structural holes.

Table 2: Centrality measures of actors in main component

1a. Out Degree											
1	Rosemann M	15	9	Love PED	9	17	Arnott DR	6	25	McKay J	6
2	Shanks G	14	10	Marshall P	9	18	Campbell J	6	26	Rahim MM	6
3	Carroll JM	13	11	Johnstone MN	8	19	Cater-Steel A	6	27	Rouse AC	6

4	Cecez-Kecmanovic D	13	12	Lowry GR	8	20	Cybulski JL	6	28	Ally MA	5
5	Fisher J	13	13	Burstein F	7	21	Fowler DC	6	29	Darke P	5
6	Lane MS	12	14	Keller S	7	22	James JA	6	30	Falconer DJ	5
7	Moody DL	11	15	Peszynski KJ	7	23	Lichtenstein S	6			
8	Shackleton P	11	16	Standing C	7	24	Lin C	6			
					1b. In Degree						
1	Shanks G	21	9	Swatman PA	11	17	Marshall P	7	25	Zaslavsky AB	6
2	Rosemann M	16	10	Carroll JM	9	18	McKay J	7	26	Burn JM	5
3	Pervan GP	13	11	Gable GG	9	19	Quaddus MA	7	27	Campbell J	5
4	Corbitt BJ	12	12	Arnott DR	8	20	Fisher J	6	28	Cavaye ALM	5
5	Standing C	12	13	Burstein F	8	21	Gregor S	6	29	Darke P	5
6	Swatman PMC	12	14	Toleman M	8	22	O'Donnell PA	6	30	Hasan H	5
7	Seddon PB	11	15	Cecez-Kecmanovic D	7	23	Venable JR	6			
8	Smith R	11	16	Howard S	7	24	Yoong P	6			
					2. Betweenness						
1	Shanks G	50	9	Bentley J	12	17	Gregor S	8	25	Corbitt BJ	7
2	Carroll JM	40	10	Howard S	12	18	Lane MS	8	26	Marshall P	6
3	Arnott DR	34	11	Campbell J	10	19	Kuzic J	8	27	Timbrell GT	6
4	Pervan GP	29	12	Gable GG	10	20	Prananto A	8	28	Steele PM	6
5	Fisher J	20	13	Lin C	10	21	Seddon PB	7	29	Standing C	6
6	Rosemann M	19	14	Burstein F	9	22	Calvert C	7	30	O'Connor M	5
7	Dawson L	16	15	Swatman PMC	9	23	Keller S	7			
8	Cecez-K D	15	16	Sandy GA	8	24	Scheepers H	7			
					3. Closeness						
1	Shanks G	22	9	Calvert C	19	17	Nguyen L	18	25	Chaiyasut P	18
2	Arnott DR	21	10	Corbitt BJ	19	18	Simsion G	18	26	Cheong K	18
3	Carroll JM	21	11	Weber R	19	19	Howard S	18	27	Moore J	18
4	Fisher J	20	12	Tansley E	19	20	Rahim MM	18	28	Nuredini J	18
5	Dawson L	20	13	Staehr LJ	19	21	Darke P	18	29	Rembach M	18
6	O'Donnell PA	20	14	Gibbs MR	18	22	Shackleton P	18	30	Tobin D	18
7	Rosemann M	19	15	Jayaganesh M	18	23	Giannoccaro A	18			
8	Pervan GP	19	16	Moody DL	18	24	Hodgson B	18			
					4. Eigenvector						
1	Shanks G	75	9	Darke P	20	17	Staehr LJ	15	25	Cheong K	13
2	Rosemann M	48	10	Indulska M	17	18	Gibbs MR	15	26	Moore J	13
3	Carroll JM	34	11	Simsion G	17	19	Recker J	14	27	Nuredini J	13
4	Arnott DR	30	12	Giannoccaro A	17	20	Tansley E	14	28	Rembach M	13
5	Weber R	22	13	Hodgson B	17	21	Jayaganesh M	14	29	Tobin D	13
6	O'Donnell PA	21	14	Fisher J	16	22	Rahim MM	14	30	Swatman PA	12
7	Corbitt BJ	21	15	Green P	16	23	Swatman PMC	14			
8	Moody DL	20	16	Nguyen L	15	24	Chaiyasut P	13			
					5. Structural Holes						
1	Shanks G	22	9	Arnott DR	12	17	Love PED	8	25	Quaddus MA	7
2	Rosemann M	18	10	Seddon PB	11	18	Gregor S	8	26	Shackleton P	7
3	Carroll JM	16	11	Gable GG	11	19	Smith R	8	27	Lane MS	7
4	Burstein F	14	12	Corbitt BJ	11	20	Zaslavsky AB	8	28	Lichtenstein S	7
5	Fisher J	13	13	Swatman PMC	10	21	Moody DL	8	29	Marshall P	6
6	Pervan GP	12	14	Campbell J	9	22	Cater-Steel A	8	30	Timbrell GT	6
7	Cecez-Kecmanovic D	12	15	Hasan H	9	23	Parker CM	7			
8	Standing C	12	16	Lowry GR	9	24	Cavaye ALM	7			

Since we chose to represent our co-authorship network as a directed network (because the author selected the co-author for writing the paper), a centrality degree analysis yielded two scores: *out degree* (number of connections sent out i.e. as main author) and *in degree* (number of connections received i.e. as co-author). The first part of Table 2 shows the ranking of the top 30 individuals on the out degree score while the second part of the table ranks individuals by the in degree score. The top scorers in terms of out degree (main author) are: Michael Rosemann closely followed by Graeme Shanks, Jennie Carroll, Dubravka Cecez-Kecmanovic and Julie Fisher. The individuals with high out degree scores can be thought of as having high influence in the network while those with high in degree scores as prestigious or popular individuals. The most prestigious individual is Graeme Shanks followed by Michael Rosemann.

In regards to betweeness centrality, the top individuals are: Graeme Shanks followed by Jennie Carroll. Thus, Shanks and Carroll can be viewed as leaders in the ACIS network since being on the shortest paths between other individuals they are able to control the flow of information in the network. The leading individuals in terms of closeness centrality are: Graeme Shanks closely followed by David Arnott, Jennie Carroll, Julie Fisher, Linda Dawson and Peter O'Donnell. Since closeness centrality measures the distance of an individual to all others in the network, the closer an individual is to others, the more favoured that individual is. Individuals with high closeness scores are likely to receive information more quickly than others as there are fewer intermediaries between them. Graeme Shanks is by far the leading individual when the eigenvector centrality criterion is used. This means that he is connected to many other individuals who are well connected and thus is most likely to receive new ideas.

Structural holes was measured in terms of *Effective size of the network* i.e. the number of connections an individual has, minus the average number of connections that each individual has to other individuals. Graeme Shanks followed by Michael Rosemann again led on this criterion suggesting that they have more opportunities to act as brokers or coordinators. From the ego analysis, it can be seen then that, unlike the ECIS community, influence in ACIS is not limited to a few individuals (Vidgen, Henneberg & Naudé 2007).

7 VISUAL ANALYSIS

The top-ranking 30 actors for each centrality criteria mentioned in Table 2 were merged and an ego network (sub-network) made up of only these actors and their collaborators extracted from the main component sub-network in an attempt to visually identify any leading individuals. The resulting network is shown in Figure 3. From Figure 3, it can be seen that Graeme Shanks and Michael Rosemann are significant individuals. It can also be seen that there are other popular individuals, such as (limited to a few names in alphabetical order as the list can be quite long): Jennie Carroll, Dubravka Cecez-Kecmanovic, Brian Corbitt, Julie Fisher, Guy Gable, Michael Lane, Graham Pervan, Peter Seddon, Craig Standing, Paul Swatman, and Paula Swatman. Figure 3 further reinforces the previous finding (from the ego analysis) that there are quite a number of key researchers in the ACIS community. Another possible limitation of the study is that the cumulative approach used to include authors in the network does not remove authors who for some reason or another are no longer present. However, in the current study this was not the case as the main actors identified are known to be still active.

8 DISCUSSION

The key findings of this study of the community of ACIS researchers are: (1) the total number of papers presented at the conference has been constantly growing since the establishment of the conference, (2) currently the percentage of co-authored papers represents 69% of the total number of papers, (3) the network contains a significantly large main component which includes 47% (587 individuals) of the total number of co-authors, (4) the main component exhibits small-world characteristics (nodes that are well-connected and close to each other), (5) although Graeme Shanks and Michael Rosemann seem to be very popular individuals, they are closely followed by a number of other popular individuals.

The positive evolution of the main component of the ACIS network coupled with the presence of a number of key individuals (rather than a few) are evidence of the healthy status of the ACIS community. They are proof of the ability of the community to attract new members over the years and to produce new generations of popular researchers. It is worth noting that although popular researchers play an important role in the ACIS network, other researchers are also important as without them is no ACIS community.

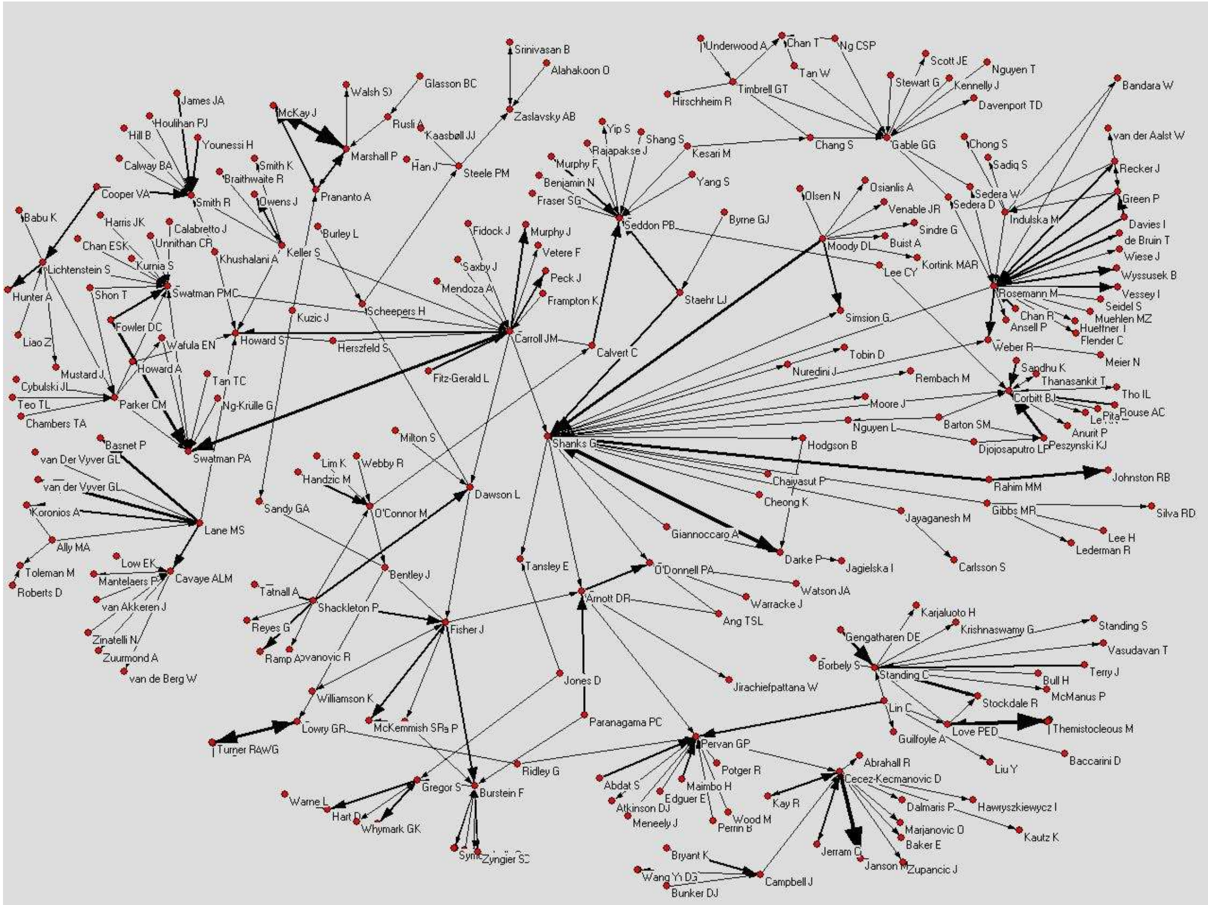

Figure 3: Main actors sub-network

The existence of a number of key researchers in the ACIS community provides several advantages. Firstly, it ensures the diversity of research within the community as a large number of popular researchers would decrease the likelihood of performing similar research. Secondly, the ACIS community is resilient since removing a few key persons from the community (e.g. retirement, etc) will not cause it to fall apart as other key persons will ensure its continued existence. Thirdly, succession planning is a smooth and effective process as the large number of current generation popular researchers train their doctoral students and junior collaborators to form a large pool of researchers from which new popular researchers will emerge to lead the community in the future.

The structural properties of the ACIS network also indicates the existence of some potential problems with the community. Since the diameter of the network is slightly wider than desirable (nine instead of six), it is possible that information might not travel quickly enough for effective collaboration. However, the diameter of the ACIS network is still better than the diameter of 31 for the ECIS network (Vidgen, Henneberg & Naudé 2007). Although the presence of many key researchers guarantees free and open debate which is the lifeblood of academia, the uptake of new ideas might meet with more opposition (e.g. political resistance, resistance to change, etc) because there are more people to convince and hence greater likelihood of disagreements.

9 CONCLUSION

In this paper, we used SNA to study the interactions between co-authors of research papers presented at ACIS. SNA provides techniques to analyse the structure of a network as an entity as well as with techniques to analyse individual nodes (egos) and their place in the network. Using SNA metrics and visualisation techniques we were able to reveal structural characteristics of the ACIS co-authors community and identify influential members of this community. The ACIS community was found to be a healthy small-world community that kept evolving in order to provide an environment that supports collaboration and sharing of ideas between researchers. It was also found that unlike Europe, the Australasian scene was not dominated by a couple of key researchers as quite a number of such people were identified.

Future work that could be undertaken to provide a better understanding of the ACIS community includes: (1) identification of the various groups that exist in the network and their research topics (using keyword analysis), and (2) incorporating institutional information in the analysis. Since most researchers publish in more than one conference or journal, the analysis of bibliographical data from ACIS cannot give a complete picture of the Australasian IS authorship patterns. Thus, for a more complete coverage of the IS discipline in Australasian, the boundary of the network should be extended to include other IS-related conferences and journals.

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