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EVOLUTION OF IS RESEARCH BASED ON LITERATURE PUBLISHED IN TWO LEADING IS JOURNALS - EJIS AND MISQ

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EVOLUTION OF IS RESEARCH BASED ON LITERATURE PUBLISHED IN TWO LEADING IS JOURNALS - EJIS AND MISQ

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Abstract

There is growing interest amongst IS academics and scholars in studying the evolution of IS research. Scholarly literature published in top-ranking IS journals provide a pertinent source for this exploratory study. However, the list of journals selected for such a study should ideally be representative of publication outlets from different regions of the world. Thus, in the research on IS evolution presented in this paper, the authors' selection of the two leading IS journals – EJIS and MISQ – is motivated by their conscious attempt to chart the evolution of IS research in both European and North American contexts. Towards this end, the paper employs co-citation analysis to identify prominent articles, authors and journals being referenced to by the citing EJIS and MISQ authors; it utilises extended citation data (e.g., keywords and article abstracts) to recognise frequently occurring noun phrases in the citing articles. The contribution of this paper is the methodological study of the evolution of IS research based on a comparative co-citation analysis of journals. The limitation of the paper is its underlying dataset that presently comprises of only two journals.

Keywords: IS Research, IS Evolution, Turning Points, CiteSpace analysis

1 Introduction

There is an ongoing debate amongst IS academics on the definition and sustainability of the discipline of IS. This debate has led scholars to suggest a number of prescriptive measures for future IS research and teaching. Related to this, one of the areas that has recently gained the attention of IS academics and scholars is the persuit towards developing an understanding of the history and evolution of IS research. While delivering the keynote speech at the 16th European Conference on Information Systems (ECIS), the President of Association for Information Systems (AIS) highlighted the need to undertake such scholarly activity and called for the IS community to conduct research critical to the survival of the discipline (Avison, 2008). This research is likely to inform the lines of inquiry that are persued by researchers, may help in obtaining research funding and, most importantly, will improve the focus and content of IS teaching. The work presented in this paper is largely influenced by this "call to arms". A further impetus for this research is the underrepresentation of European publications when considering journal rankings (Mylonopoulos and Theoharakis, 2001; Gallivan and Benbunan-Fich, 2007). As an example, we cite the study conducted by Sidorova et al. (2008) that focuses on uncovering the intellectual core of the Information Systems discipline. One of the important limitations of this study is the exclusion of European publications from the analysis; thus, the findings are skewed towards the North American way of thinking about IS development, IS management, and IS usage. Sidorova et al. (2008) recognise this limitation and call for researchers to undertake a study on the evolution of IS intellectual wealth from the European perspective.

The work presented in this paper is guided by the authors' acknowledgement of the need to do further research in IS evolution, as this would permit better understanding of this area (hopefully without any regional bias). Towards this end, the paper aims to elicit and map the evolution of IS research based on research published in one North American IS journal (*MIS Quarterly - MISQ)* and one European journal (*European Journal of Information Systems - EJIS*). Both MISQ and EJIS are considered as leading IS journals (AIS, 2007; Fisher *et al*., 2007). The study forms an initial effort towards comparative understanding of the history and evolution of IS research with regard to North America and Europe. The remainder of this paper is structured as follows. Section 2 presents a literature review; this is followed by the section on research methodology (Section 3). Section 4 then presents a discussion on the EJIS/MISQ dataset and the analyses to be conducted. The results of the analyses are presented in the section pertaining to findings (Section 5). Section 6 presents the conclusions and limitations of this work, and draws the paper to a close.

2 Literature Review

Several studies have classified, categorised and profiled existing journal and conference publications based on a number of dimensions, e.g., author and institutional productivity, geographical diversity, theoretical/methodological diversity, emergence of research agenda (Avison *et al*., 2008; Avgerou *et al*., 1999; Barki *et al*., 1993; Benbasat and Weber, 1996; Claver *et al*., 2000; Dwivedi and Kuljis, 2008; Dwivedi *et al*., 2008; Gallivan and Benbunan-Fich, 2007; Galliers *et al*., 2007; Galliers and Whitley, 2002, 2007; Grant and Koop, 1995; Lee *et al*., 1999; Lyytinen *et al*., 2007; Mingers and Harzing, 2007; Ramiller *et al*., 2008; Vessey *et al*., 2002; Vidgen *et al*., 2007). Yet another stream of studies have focused on the issue of imbalance between North American and European IS research (Katerttanakul and Han, 2003; Dwivedi and Kuljis, 2008; Lyytinen *et al*., 2007). Examples of such imbalances include, the marked geographical disparity of authors between European and American IS journals; their differences in terms of the research methods they employ (e.g., with regard to studies on IS management, European journals like *EJIS* usually use a qualitative interpretative empirical approach using case studies, whereas American journal like *Information & Management* generally employ a quantitative positivist approach

based on surveys). These cross-continental studies have prompted researchers to gain a deeper understanding of the possible reasons for such imbalances and to recommend solutions to correct them. Finally, there are a number of studies that have focussed on the development of the IS discipline, for example, Mingers (2004) presents a personal overview of the history of the IS discipline over the last 20 years and highlighted the epistemological battle between positivism and interpretivism and a related debate over a critical approach to information systems.

The review of literature in this section has shown that an increasing number of studies are employing profiling techniques, bibliometric analysis and meta-data analysis in order to gain a better understanding of the evolution of IS research. It is expected that this study will contribute to this growing corpus of literature by charting the evolution of IS research in both European and North American contexts. Furthermore, the paper demonstrates the added value of using co-citation analysis in conducting a bibliometric study.

3 Research Method

Our research method primarily employs co-citation analysis. In a citation-based investigation the significance of an article is often measured in terms of the number of cites it has received. However, it can be argued that certain articles may be significant even though they may have relatively fewer number of citations (for example, papers that have fewer citations but have been cited across domains; papers with fewer but a consistent number of citations through the years). Furthermore, it usually takes at least 5-6 years for a paper to build up its citation count. Thus, using only citation metrics to identify significant articles would risk excluding articles that hold promise. Co-citation analysis offers a potential solution to this – it identifies clusters of "co-cited" references by creating a link between two or more references when they co-occur in the reference lists of citing articles (Raghuram et al., 2010). These co-citation clusters (also referred to as co-citation networks) provide important insights into knowledge domains by identifying frequently co-cited papers, authors and journals.

Our underlying dataset comprises of both *citing articles* and the references they cite (*cited articles*). The latter is essential for co-citation analysis. In our research we have used the software program called *CiteSpace* (Chen, 2004) for co-citation analysis. CiteSpace identifies significant papers (also referred to as the "turning point" articles), authors ("turning point" authors) and journals irrespective of their citation count; it implements innovative visualisation techniques to visual identify such points of significance in the underlying co-citation networks (refer to Figure 1). In this study we specifically use CiteSpace to extract (and subsequently to compare) the values of specific variables from our underlying EJIS and MISQ datasets.

4 EJIS/MISQ Datasets and CiteSpace Analysis

ISI Web of Knowledge^{SM} (Thomson Scientific Solutions, 2011) archives citation data pertaining to impact factor journals (this includes both EJIS and MISQ). For this study we decided to limit our analysis from 1995 to 2008. The lower bound was selected since ISI Web of Knowledge^{SM} archives EJIS data from 1995. The upper bound of 2008 is the year in which leading researchers encouraged the community to undertake research on IS evolution (Avison, 2008; Sidorova *et al*. 2008). The downloaded EJIS/MISQ citation data consists of only articles and reviews. In total, 387 records (375 articles and 12 reviews) were considered for EJIS; in the case of MISQ only 339 records (288 articles and 51 reviews) were included in our study. CiteSpace was used to analyse the data downloaded from ISI and two separate analyses were conducted for EJIS and MISQ respectively. Identical CiteSpace options were selected for both the

analyses, for example, the time interval of analysis was set to 1995-2008, the unit of analysis 3 years per time slice, etc. A brief overview of the analysis performed by CiteSpace is now presented.

Nodes and links are the building blocks of a co-citation network. CiteSpace supports a total of eight different Node Types (NTs), e.g., *NT references, NT cited authors, NT cited journals, NT keywords*. The different time-sliced co-citation networks are distinguished by their colour. The colours indicate time and through the use of the VIBGYOR spectrum they represent the entire time interval of the analysis (1995-2008). For example, in our analysis the time slice 1995-1997 is shown in indigo, 1998-2000 is represented in blue, time slice 2001-2003 is shown in green, and so on and so forth (see Figure 1[*]). The nodes are connected through links and they visually represent several characteristics of the underlying network, for example, the colour of the link represents the year in which a connection between two nodes was first established, and the strength of connection between any two nodes is represented by the thickness of the link. Further description of CiteSpace (in relation to specific EJIS/MISQ analyses) is presented Section 5.

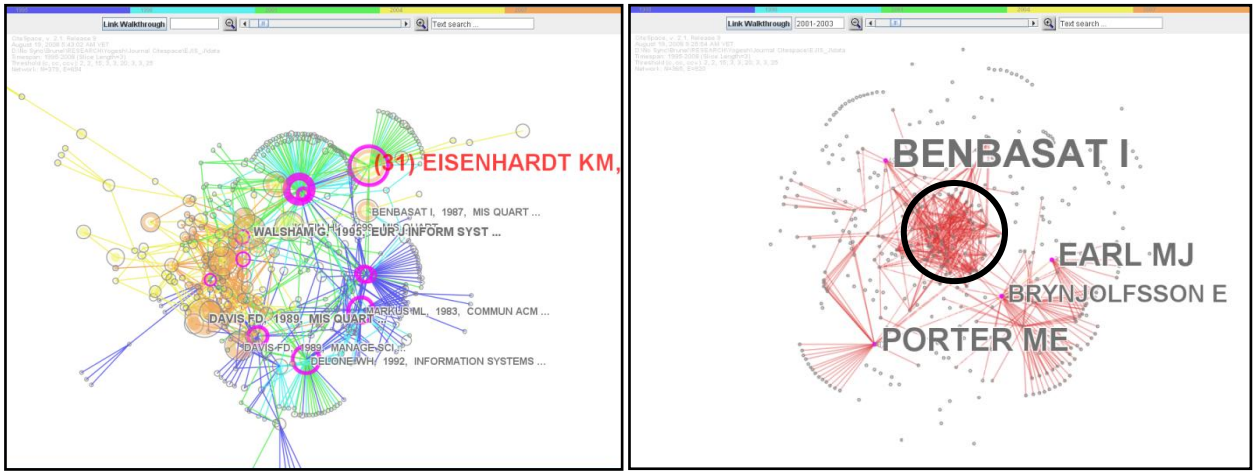

Figure 1 [LEFT]: CiteSpace identifying the highly cited articles in EJIS; Figure 2 [RIGHT]: Author co-citation network for 2001-2003 (EJIS dataset) showing high-occurrences of co-citation among authors.

5 Findings

In this section we present the findings of our study under four distinct subsections: (a) a combined analysis of highly cited articles and turning point articles *(section 5.1);* (b) a combined analysis of highly cited authors and turning point authors *(section 5.2);* (c) highly cited journals *(analysis section 5.3);* (d) evolution of IS *(section 5.4).*

5.1 Combined analysis of highly cited articles and turning point articles

This analysis is based on the underlying article co-citation network that is generated by CiteSpace. Thus each node in the resultant network refers to an article (see Figure 1). The highly cited articles can be visually identified though user interaction with the node size control. The higher the citations for a paper (in case of *NT cited authors, NT cited journals, NT keywords*, etc. it is the occurrence frequency) the more prominent the nodes will be in terms of their diameter. The text beside the node identifies the article and

[*] CiteSpace represents multiple variables using a variety of visualisation techniques - including colour. The text to certain colours in the output generated by CiteSpace. However, the CiteSpace screenshots in this paper are in B&W. Thus, we have uploaded the colour versions of all the B&W CiteSpace screenshots in the following website http://tinyurl.com/37opqg8. The reader is encouraged to refer to the website to better understand the analysis presented in this section

its co-citation count, for example, a paper by Eisenhardt is shown to have the highest number of co-citations (31). For *NT references*, the purple rings that surround the citation ring identify turning point articles. CiteSpace identifies potentially important articles in a co-citation network through *landmark nodes* (a node with extraordinary attributes), *hub nodes* (widely co-cited article) and *pivot nodes* (common nodes that are shared between two co-citation network or gateway nodes that are interconnected by inter-network links), and by enhancing the visual features of such nodes it makes it easier to detect them through visual inspection (Chen, 2004). It is important to note that turning point articles that are identified by CiteSpace are not necessarily those that have high citations. This analysis is very different to the previous analysis, which only considers the number of citations as the key indicator. From the results of our combined analysis of highly cited articles and turning point articles we are able to make the following observations (refer to Table 1):

(1) In case of highly-cited articles, five papers are common to both EJIS and MISQ (EISENHARDT KM, 1989; DAVIS FD, 1989 (MIS Quart) and 1989 (Manage Sci); DELONE WH, 1992; KLEIN HK; 1999).
(2) In case of turning point articles, only two article are common to both EJIS and MISQ (EISENHARDT KM, 1989; DELONE WH, 1992).
(3) There are five turning point articles in EJIS which also appear in the EJIS list of top 10 highly-cited articles (EISENHARDT KM, 1989; MARKUS ML, 1983; DELONE WH, 1992; WALSHAM G, 1993; CHECKLAND P, 1981).
(4) There are seven articles in MISQ that are considered turning point articles. These articles also appear in the MISQ list of top 10 highly-cited articles (EISENHARDT KM, 1989; DAVIS FD, 1989 (MIS Quart) and 1989 (Manage Sci); DELONE WH, 1992; FORNELL C, 1981; DESANCTIS G, 1994; ORLIKOWSKI WJ, 1992).
(5) There are two articles that not only appear in both EJIS and MISQ list of top 10 highly-cited articles, but they are also considered turning point articles by both the journals (EISENHARDT KM, 1989; DELONE WH, 1992).
(6) There are a total of five articles that appear in either one of the two lists, namely the list for turning point articles and the list for highly-cited articles, for both the EJIS and MISQ journals (EISENHARDT KM, 1989; DAVIS FD, 1989 (MIS Quart) and 1989 (Manage Sci); DELONE WH, 1992; KLEIN HK; 1999). These five articles are shaded in grey in Table 1 below.

Author	Year	Source	Paper title	EJIS TP	EJIS Cit	MISQ TP	MISQ Cit
EISENHARDT KM	1989	ACAD MANAGE REV	Building Theories from Case Study Research	yes	yes	yes	yes
DAVIS FD	1989	MIS QUART	Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology		yes	yes	yes
WALSHAM G	1995	EUR J INFORM SYST	Interpretive case studies in IS research: nature and method		Yes		
MARKUS ML	1983	COMMUN ACM	Power, politics, and MIS implementation	yes	yes		
DELONE WH	1992	INFORMATION SYSTEMS	Information Systems Success: The Quest for the Dependent Variable	yes	yes	yes	yes

KLEIN HK	1999	MIS QUART	A set of principles for conducting and evaluating interpretive field studies in information systems		yes		yes
DAVIS FD	1989	MANAGE SCI	User acceptance of computer technology: a comparison of two theoretical models		yes	yes	yes
WALSHAM G	1993	INTERPRETING INFORMA	Interpreting Information Systems in Organizations	yes	yes		
CHECKLAND P	1981	SYSTEMS THINKING SYS	Systems Theory/Systems Theory, Systems Practice	yes	yes		
FORNELL C	1981	J MARKETING RES	Evaluating structural equation models with unobservable variables and measurement error			yes	yes
DESANCTIS G	1994	ORGAN SCI	Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory			yes	yes
ORLIKOWSKI WJ	1992	ORGAN SCI	CASE Tools as Organizational Change: Investigating Incremental and Radical Changes in Systems Development			yes	yes

Table 1: EJIS /MISQ articles with high citation (Cit) and turning point articles (TP)

5.2 Combined analysis of highly cited authors and turning point authors

The findings of this section are based on the author co-citation network that is generated by CiteSpace (upon selection of *NT cited authors*). Table 2 presents a list of top 20 authors that are highly cited by the EJIS/MISQ authors, together with the frequency. Each author is represented as a node in the co-citation network. In visualisation terms, this is similar to the visualization of highly cited articles that is shown in Figure 1. However, it is possible to determine other characteristics from the author co-citation network, for example, a group of co-citing authors. An example of this is presented in Figure 2, where the high-occurrences of co-citation among authors are highlighted by a circle. Our analysis of EJIS dataset has identified four turning point authors, namely, Benbasat, I. Porter, M.E., Earl, M.J. and Brynjolfsson, E. Again, similar to the *turning point article* analysis, the reader should note that these authors are not necessarily the ones that have the highest number of citations. The turning point authors are identified with a grey background in Table 2. Brynjolfsson, E is not shown in the table since the author does not have enough citations to make it to the top-20 EJIS list. It is worth noting that the author co-citation network for MISQ dataset does not identify turning point authors.

Authors highly cited by EJIS publications		**Authors highly cited by MISQ publications**	
Freq	**Author**	**Freq**	**Author**
71	WALSHAM G	94	ORLIKOWSKI WJ
71	MARKUS ML	79	MARKUS ML
70	ORLIKOWSKI WJ	64	DAVIS FD
52	YIN RK	59	CHIN WW
49	BENBASAT I	57	JARVENPAA SL

46	DAVIS FD	54	ROBEY D
42	DAVENPORT TH	51	BENBASAT I
41	DELONE WH	50	DAVENPORT TH
40	EISENHARDT KM	49	DESANCTIS G
40	LYYTINEN K	45	EISENHARDT KM
37	CHECKLAND P	44	FORNELL C
35	ROBEY D	43	YIN RK
34	GALLIERS RD	40	AGARWAL R
33	JARVENPAA SL	40	SAMBAMURTHY V
32	EARL MJ	40	VENKATESH V
32	PORTER ME	39	IVES B
31	ROGERS EM	38	DELONE WH
31	WILLCOCKS L	38	LEE AS
30	HIRSCHHEIM R	37	VENKATRAMAN N
30	VENKATRAMAN N	36	KEEN PGW

Table 2: EJIS/MISQ top 20 highly cited authors (Turning point authors: grey background)

5.3 Hightly cited journals

The top 20 journals that have been highly cited by the EJIS and the MISQ authors are presented in Table 3. The list shows that MIS QUART (MISQ) and COMMUN ACM are the top two cited journals in both EJIS and MISQ datasets. It is interesting to note that MISQ scores the highest rank for both MISQ and EJIS. Finally, all of the top ten cited journals within MISQ are American journals.

Journals highly cited by EJIS publications		**Journals highly cited by MISQ publications**	
Freq	**Journal Abbreviation**	**Freq**	**Journal Abbreviation**
302	MIS QUART (MIS Q)	422	MIS QUART (MIS Q)
198	COMMUN ACM	217	COMMUN ACM
165	INFORMATION SYSTEMS	208	MANAGE SCI
157	MANAGE SCI	204	INFORM SYST RES
149	EUR J INFORM SYST	190	INFORMATION SYSTEMS
115	INFORM MANAGE	161	ACAD MANAGE REV
112	ACAD MANAGE REV	160	ORGAN SCI
110	INFORM SYST RES	158	J MANAGEMENT INFORMA
106	J MANAGEMENT INFORMA	120	ACAD MANAGE J
102	HARVARD BUS REV	116	HARVARD BUS REV
100	ORGAN SCI	115	ADMIN SCI QUART
80	SLOAN MANAGE REV	106	DECISION SCI
69	INFORM SYST J	93	J MARKETING RES
65	INFORMATION TECHNOLO	93	ADM SCI Q
61	ACAD MANAGE J	88	INFORM MANAGE
61	DECISION SCI	81	STRATEGIC MANAGE J
54	J STRATEGIC INF SYST	73	J PERS SOC PSYCHOL
52	CASE STUDY RES DESIG	72	J MANAGE
51	ADMIN SCI QUART	72	J MARKETING
49	J MANAGE INFORM SYST	68	PSYCHOL BULL

Table 3: EJIS and MISQ Comparison: Top 20 highly cited journals

5.4 Mapping the evolution of IS

In this analysis we use CiteSpace time-zone visualisation. The resultant visualisation for EJIS is shown in Figure 3 (a similar analysis was conducted for MISQ). The visualisation is based on the noun phrase analysis performed by CiteSpace. The noun phrases help to identify important single and multi-word terms that have been used by the authors in the paper titles and the abstracts. This analysis is different from keyword analysis since not all noun phrases are included as keywords, and vice versa. Table 4 lists the top three noun phrases associated with EJIS and MISQ journals for each year, along with their respective frequencies. Through analysis of the noun phrases we expect to depict the evolution of IS domain in general and the changing focus of IS topics published in EJIS and MISQ.

Year	EJIS		MISQ	
	Frequency	**noun phrase**	**frequency**	**noun phrase**
1996	63	technology	40	Organizations
	44	information-systems	26	information-systems
	42	management	20	decision-making
1997	33	implementation	20	Information
	15	diffusion	20	technology acceptance model
	13	power	18	future research
1998	26	Success	28	Design
	14	future research	27	Communication
	11	Quality	16	Organization
1999	33	organizations	26	Adoption
	25	performance	17	Business
	25	adoption	13	self-efficacy
2000	14	Usage	24	Knowledge
	8	action research	14	Determinants
	4	different perspectives	11	Issues
2001	13	knowledge management	19	Firm
	11	information	9	Acceptance
	10	Firm	8	group decision-making
2002	26	perspective	23	knowledge management
	7	perceived usefulness	9	Power
2003	27	information-technology	29	Perspective
	16	competitive advantage	13	resource-based view
	12	Internet	5	Communication technologies
2004	12	electronic commerce	13	information systems research
			10	dynamic capabilities
			7	action research
2005	18	user acceptance	26	information-technology
	14	framework	12	firm performance
	12	business	7	perceived ease
2006	11	acceptance	20	Trust
	7	case study	11	planned behaviour
	6	antecedents	10	Internet
2007	12	impact	10	theoretical model
	7	technology acceptance model	8	Communities
	7	e-government	7	important role

Table 4: EJIS and MISQ comparison: Top three noun phrases in each year

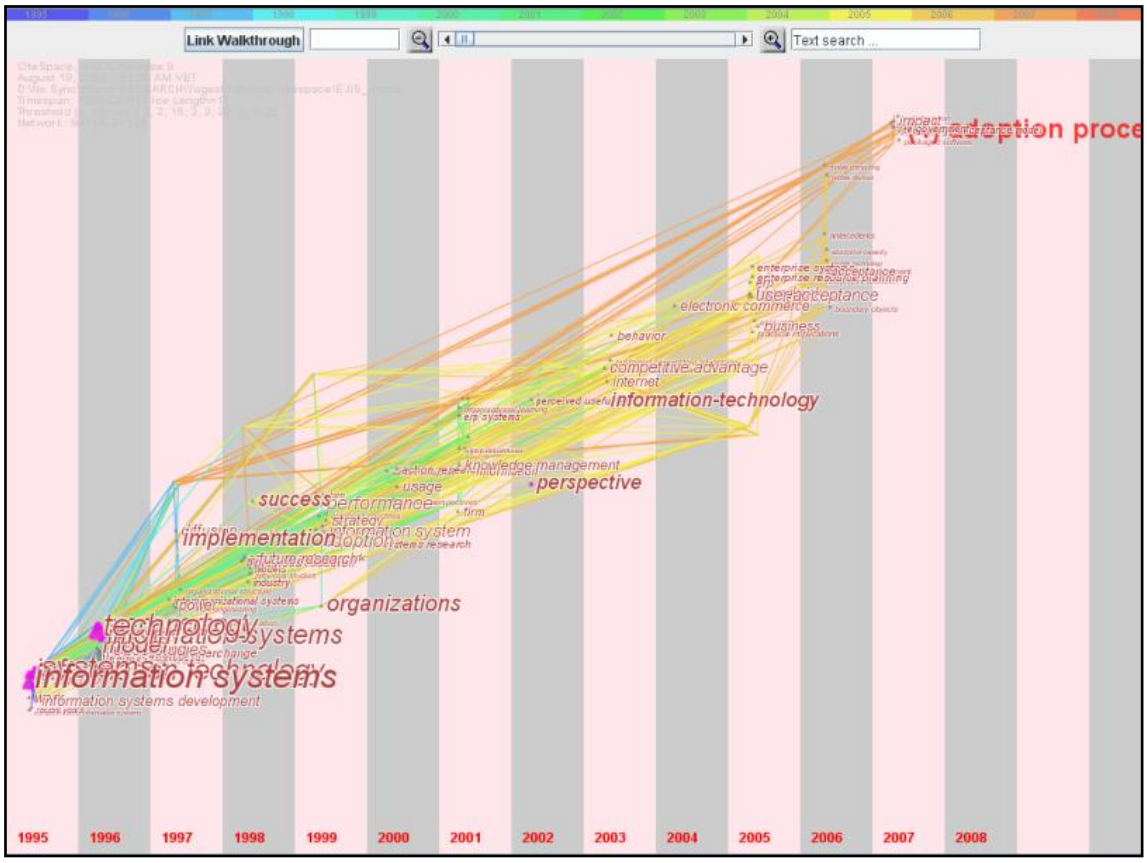

Figure 3: Year-on-year analysis of EJIS publications using noun phrases

The findings suggest that both journals followed similar evolutionary journeys in terms of primary research topics. From data presented in Table 4 and from Figure 3, it can be seen that, in the mid- 90s, the terms *Information-Systems* and *Information Technology* were dominating the scene, as most authors were trying to explore issues related to defining the field. This was common for both EJIS and MISQ. From the late 90s up to around 2003, the term IS was put within the contexts of "organisation" or "business" and how IS could/should help in its "success". A reason for this increase can possibly be attributed to the boom and bust of IS related businesses. Both EJIS and MISQ agree on these trends, although some of the terms were used at different points of time during this period. From 2004 onward, research focussed on the wider communities of *users* and *user-acceptance*. It is interesting how research on user perspective took a relatively long time to catch up with the other topics in the field. This is also true of research on issues such as trust, enterprise wide systems and a number of e-issues.

6 Conclusions

This study represents an initial step towards understanding the history and evolution of IS research. In doing so, the article analyses published literature in two leading IS journals - *EJIS* and *MISQ*. The objective of this comparative study is to identify landmarks that influenced the evolution of IS by assessing their association with a number of variables (cited articles, cited authors, cited journals, and noun phrases).

One conclusion that can be drawn from this study is that both EJIS and MISQ follow similar research patterns and trends. An example to note is the re-appearance of the term "Information Technology" in

both EJIS and MISQ in 2003 and 2005 respectively (Table 4). This may be due to the emergence of new generations of mobile and telecommunication technologies, which motivated the community to reinvent its practices and reflect on its meaning. The cyclic appearance of "IT/IS – Business organisations – IT/IS" in the literature also confirm the nonlinear feedback relationship between IS/IT and business environment. For example, innovation in IS/IT influences the way we do business (which is confirmed by the research focus of articles). Environmental pressures in the business act as a driver for innovations in IS/IT as confirmed by the re-appearance of term IS/IT after the emergence of mobile technology. This is clear evidence that research in IS is motivated by the emergence of new technology throughout its history.

Another contribution of this paper is the use of co-citation analysis for bibliometric analysis. In the current (and predominant) practice of citation-based analysis, the significance of an article is often measured on the basis of the number of citations it has had. However, findings from this article suggest that this may not always be the case. We used CiteSpace for co-citation analysis to identifying the turning point papers and the turning point authors. Indeed, the analysis presented in this paper confirms that the highly cited papers are not necessarily the turning point papers (Table 1). Therefore, future studies utilising only citation counts as means for analysis ought to be more careful in their interpretations and recommendations. The limitations of this study and future research directions are presented next.

Although our study is a good start towards understanding the history and evolution of IS research, its findings are limited. There are many good quality IS journals, but this study has only performed an analysis of two journals. Therefore, although findings of this research are salient and substantial, the findings are not representative of the large body of IS research. This offers clear avenue for future research.

References

AIS. (2007). Letter from Dennis Galletta, President, Association for Information Systems - November, 2007. Available at: http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=378 [04/04/2011].

Avison, D. (2008) Keynote 2: The Theme of Participation in the Practice, Teaching and Research of Information Systems … or … Designing the Discipline of IS: An Egocentric View. In *Proceedings of the 16th European Conference on Information Systems*, 9th – 11th June, 2008, Galway, Ireland.

Avison, D., Dwivedi, Y.K., Fitzgerald, G., and Powell, P. (2008). The beginnings of a new Era: Time to reflect on 17 years of the *ISJ*. *Information Systems Journal*, 18(1), 5-21.

Avgerou, C., Siemer, J., and Bjorn-Andersen, N. (1999). The academic field of information systems in Europe. *European Journal of Information Systems*, 8(2), 136-153.

Barki, H., Rivard, S., and Talbot, J. (1993). A keyword classification scheme for IS research literature: an update. *MIS Quarterly*, 17(2), 209–225.

Benbasat, I., and Weber, R. (1996). Research commentry: Rethinking "diversity" in information systems research. *Information Systems Research*, 7(4), 389-399.

Chen, C. (2004). Searching for intellectual turning points: Progressive knowledge domain visualization. In *Proceedings of the National Academy of Sciences*, USA, 101 (Suppl.), 5303–5310.

Chen, C. (2006). CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *Journal of the American Society for Information Science and Technology*, 57(3), 359-377.

Claver, E., Gonzalez, R., and Llopis, J. (2000). An analysis of research in information systems (1981–1997). *Information and Management*, 37(4), 181–195.

Fisher, J., Shanks, G., and Lamp, J. (2007). A ranking list for information systems journal. *Australian Journal of Information Systems*, 14(2), 5-18.

Dwivedi, Y. K., Kiang, M., Lal, B., and Williams, M. D. (2008). Profiling Research Published in the Journal of Electronic Commerce Research. *Journal of Electronic Commerce Research*, 9(2), 77-91.

Dwivedi, Y. K., and Kuljis, J. (2008). A Profile of IS Research Published in the *European Journal of Information System*. *European Journal of Information Systems*, 17(6), 678-693.

Galliers, R. D., Whitley, E. A., and Paul, R. J. (2007). Guest Editorial: The European Information Systems Academy. *European Journal of Information Systems*, 16(1), 3-4.

Galliers, R. D., and Whitley, E. A. (2002). An anatomy of European information systems research ECIS 1993-ECIS2002: some initial findings. In *Proceedings of the 10th European Conference on Information Systems*, pp. 3-18, Gdansk, Poland.

Galliers, R. D., and Whitley, E. A. (2007). Vive les differences? Developing a profile of European information systems research as a basis for international comparisons. *European Journal of Information Systems*, 16(1), 20-35.

Gallivan, M., and Benbunan-Fich, R. (2007). Analysing IS research productivity: an inclusive approach to global IS scholarship. *European Journal of Information Systems*, 16(1), 36-53.

Grant, R., and Koop, R. (1995). Canadian traditions and directions in information systems research. *Canadian Journal of Administrative Science*, 12(1), 38-55.

Katerttanakul, P., and Han, B. (2003). Are European IS journals under-rated: an answer based on citation analysis. *European Journal of Information Systems*, 12(1), 60-71.

Lee, Z., Gosain, S., and Im, I. (1999). Topics of interest in IS: evolution of themes and differences between research and practice. *Information and Management*, 36(5), 233-246.

Lyytinen, K., Baskerville, R., Iivari, J., and Te'eni, D. (2007). Why the old world cannot publish? Overcoming challenges in publishing high-impact IS research. *European Journal of Information Systems*, 16(4), 317-326.

Mingers, J. (2004). Paradigm wars: ceasefire announced who will set up the new administration? *Journal of Information Technology*, 19(3), 165-171.

Mingers, J., and Harzing, A-W. (2007). Ranking journals in business and management: a statistical analysis of the Harzing data set. *European Journal of Information Systems*, 16(4), 303-316.

Mylonopoulos, N. A., and Theoharakis, V. (2001). Global perceptions of IS journals. *Communications of the ACM*, 44(9), 29–33.

Raghuram, S., Tuertscher, P., and Garud, R. (2010). Mapping the field of virtual work: A cocitation analysis. *Information Systems Research*, 21(4): 983-999.

Ramiller, N. C., Swanson, E. B., and Wang, P. (2008). Research directions in information systems: toward an institutional ecology. *Journal of the Association of Information Systems*, 9(1), 1-22.

Sidorova, A., Evangelopoulos, N., Valacich, J. S., and Ramakrishnan, T. (2008). Uncovering the Intellectual Core of the Information Systems Discipline. *MIS Quarterly*, 32(2), 467-482.

Thomson Scientific Solutions (2011). ISI Web of Knowledge. http://apps.isiknowledge.com [04/04/2011].

Vessey, I., Ramesh, V., and Glass, R. (2002). Research in information systems: an empirical study of diversity in the discipline and its journals. *Journal of Management Information Systems*, 19(2), 129–174.

Vidgen, R., Henneberg, S., and Naude, P. (2007) What sort of community is the European Conference of Information Systems? A social network analysis 1993-2005. *European Journal of Information Systems* 16(1), 5-19.