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An IS Scholar and Scholarship Ranking Based on Contributions to Doctoral Education

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Abstract:

This research introduces a new information systems (IS) scholar and scholarly work ranking based on contributions to IS doctoral education. We examine syllabi of introductory PhD seminars offered across North America to identify and rank scholars and scholarly works most often called on in shaping future scholar's minds and careers. These rankings can also be used, along with available IS scholar ranking, to better recognize active and influential scholars in the IS field.

Keywords: Scholar Ranking, Paper Ranking, Doctoral Seminars, Information Systems.

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I. INTRODUCTION

Academic rankings play a critical role in scholars' lives. They are a measure of competence for researchers; as Adler and Harzing (2009) explain, academic rankings distinguish "winners from losers". Rankings are used in promotion decisions as measures of research productivity. High-ranking scores are also a source of prestige in the academy (Adler & Harzing, 2009). More importantly, as we demonstrate in this paper, rankings can help identify a field's intellectual underpinnings. Considering ranking's importance, we need to have a solid understanding of the methods used in ranking processes. Academic rankings that focus on individual scholar scores in particular fields are typically based on the number of published papers and their quality; these are measured through the quality of journals in which the papers are published. In addition, some ranking systems also count the number of citations for each paper (Rynes, 2007).

Unfortunately, these techniques are far less capable of identifying the scholarly works used in educating new PhDs. One example of this problem is a paper published in a relatively lower-ranked journal despite the quality of the paper or its fundamental effects on the field. When a paper is published in a lower-quality journal, it usually attracts less attention from other scholars than it would if published in a high-ranked journal. Nevertheless, these papers might be important and have profound impacts on the scholar community in a given field. Papers that are published in a special issue of a lower-ranked journal in response to an issue elaborated in the research community are among these papers. To illustrate, consider all papers in the special issue of *Journal of Association for Information Systems* that respond to the lack of an information technology artifact in information systems research that Benbasat and Zmud (2003) illustrate. No one can dispute the importance of these papers that discuss one of the most important issues pertaining the MIS field, the so-called MIS field identity crisis. However, their importance and contribution to the MIS field may be overlooked mainly because they are not published in a top-tier journal such as *MIS Quarterly* or *Information Systems Research*. Another problem occurs when the citation count takes a part in the ranking system. The problem arises from the fact that many papers that have a more general approach to a field (those discussing intra-disciplinary issues) may not get cited as much as papers that are advancing a specific theory. For example, in the MIS field, papers that address how to do research in MIS (e.g., Dickson, DeSanctis, & McBride, 1986; Ives, Hamilton, & Davis, 1980) or those that address debates over IS core and theory (e.g., Benbasat & Zmud, 2003; Robey, 2003) are less cited than papers that address specific issues and theories such as the technology acceptance model (Davis, 1989).

In this paper, we introduce a new scholar ranking intended to mitigate the above problems. This ranking identifies papers and authors that have the most impact on MIS doctoral education. While many foundational papers in MIS are discussed in MIS doctoral seminars, they may not necessarily be published in high-ranking journals or may not have had many citations; However, they will impact MIS doctoral students' minds because they are repeatedly discussed in the classrooms and among PhD cohorts. These research studies frame future scholars' mindset and prepare them for their career. The lesson drawn from works discussed in MIS doctoral seminars will also shape their careers .

We focus on the introductory MIS seminars at doctoral level because these seminars help shape the students' initial understanding of the MIS field and have a profound impact on shaping students' mindset. We use syllabi of these courses as primary sources of data and analyses.

II. LITERATURE REVIEW

Measures of Individual Performance

Many scoring systems can be found in the literature for quantifying the scientific production (in terms of publications) of researchers, departments, and/or universities. These systems (accumulations of set of rules) are then often used to derive rankings of authors or departments. Over the past few years, the academic community has witnessed a dramatic increase in the number of ranking systems. Many researchers, analyzing previously existing systems, have found drawbacks in existing ranking systems and proposed adapted versions of the incriminated index or a brand new ones that are hypothetically better than the older ones (Marchant, 2009). In this section, we briefly review the most used scholar-ranking systems.

Many popular bibliometric rankings are essentially scoring rules. For instance, if only the number of publications for set of authors is counted, the obtained ranking will be based on the number of publications. It is also possible to obtain a ranking only based on citations or combine the number of citations with the number of publications. It is possible to set a minimal rule for citations and only count publications with more than a certain number of citations as Chapron and Husté (2006) have done. Some ranking systems factor in the quality of publishing journals by using journal impact factors in scoring rules as Fava and Ottolini (2000) suggest. Other systems obtain rankings based on the total number of citations, weighted by the number of authors as Pijpers (2006) suggests. It is possible to create many rankings through purposeful and creative combinations of number of published papers, number of citations, and journal impact factors (Chapron & Husté, 2006).

Some rankings are based only on the number of citations for a given paper such as h-index ranking. This system measures both the scientific productivity and the apparent scientific impact of a scientist through citation count. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other academic publications. The h-index is defined as the number of papers with a citation number greater than "h". The index can also be applied to examine the productivity and impact of a group of scientists, such as a department, university, or country (Hirsch, 2005). Other similar ranking systems are based on the maximum number of citations, or on the average number of citations (Marchant, 2009).

MIS Scholar Rankings

In their attempt to provide an objective individual rankings for MIS, Im, Kim, and Kim (1998) examine six journals that publish MIS-related researches (*Decision Sciences*, *MIS Quarterly*, *ISR*, *Communications of ACM*, *Journal of MIS*, and *Management Science*) for papers and their authors over the period of 1991 to 1996, excluding book reviews, dissertation abstracts, letters, opinions, columns, and editorials. They use the normal and adjusted count approaches suggested by Lindsey (1980) to assess the research productivity of a given researcher. In the normal count approach, all publications in which the researcher participates are counted. The normal count is the most favored count among researchers according to Jackson and Nath (1989) and Chua, Cao, Cousins, and Straub (2002). For example, a paper with three co-authors provides a unit count for each of the three authors. Compared to the normal count method, the adjusted count approach provides a more realistic representation of a researcher's accomplishments. Each co-author of a paper receives a fraction of a unit count. For example, a paper with four co-authors yields a 0.25 credit for each of the researchers. Im et al. (1998) also used another productivity measure called the weighted page count (Chua et al., 2002) that counts the number of pages for each paper and the importance of each journal in assessing the research productivity of a given researcher.

Chua et al. (2002) use a combination of normal count, adjusted count, and straight count to measure IS researchers' productivity and the effects of journal and IS departments. Under the normal count method, they assume that all authors of a paper perform equivalent work; thus, papers with more authors are more valuable than papers with fewer authors. Therefore, in normal count, every coauthor receives one point. Under the adjusted count method, they assume equal value for every paper and equal authorship for all authors; thus, the score for each paper and its respective authors is determined through assigning equal weights to each author out of an available 1 score for each paper. Under the straight count, they assume that each paper is equivalent and only their first authors are responsible for idea creation; thus, only the first author deserves the credit. The counting methods of Chua et al. (2002) has been used by the website called IS Research Ranking (http://vvenkatesh.com/ISRanking/index.asp) which holds an up-to-date database of IS publications, scholars, institutions, and journals to rank IS researchers, institutions, and journals on a consistent and periodic base. This website, however, only uses normal count and adjusted count to report rankings.

III. METHODOLOGY

Rankings

With this paper, we recognize researchers and scholarly works that influence fresh minds of IS doctoral students as future scholars. We do not diverge from the tradition of IS in ranking scholars and publication outlets; thus, we employ scoring rule methods rather than citation analysis methods such as the h-index (Hirsch, 2005). Similar to the primary ranking source for MIS, the IS Research Rankings website, this paper reports normal count and weighted normal count.

The problem with the currently employed scoring rules in MIS is that they may not fairly reflect the actual contribution of scholars to published works. Normal count and adjusted count both imagine equal weights for a paper's authors. Normal count gives a score of one to all the authors that are listed on a paper; adjusted count divides the score of 1 among all the authors of a paper and gives them the fraction of a unit score. While these scoring technics might be useful in fields that have tradition of listing authors in alphabetical order (i.e., biochemistry), these techniques do not

do the justice for fields that have the tradition of listing authors based on their contribution to an paper such as MIS. Thus, we use the weighted normal count in addition to the normal count to provide readers with a more-accurate ranking.

The difference between normal count and weighted normal count is that the former assumes equal scores for each author regardless of the position of the authors in paper's author list. It basically assumes the equal authorship rights for all authors of a research paper or a book that appears in our database and gives a score of 1 to a given scholar name when it appears regardless of their position in the list. However, under the weighted normal count, being the second author is not rewarded the same as being the first author: if a scholar name appears as the second author, they will receive a fraction of what first author received. This paper adapts a modified version of weights used by Shim, English, and Yoon (1991). We assigned the weights as follows: the first author was rewarded with the score of 1, second author with 0.85, third with 0.70, fourth author with 0.55, fifth author with 0.40, sixth author with 0.25, and seventh author with 0.10. We assigned no score to eighth authors or those beyond. The weighted normal count is an auxiliary count that helps the ranking mechanism when there is a draw among a group of scholars based on the normal count. Thus, when there is more than one scholar with the same score, their weighted normal score can be used for ranking.

Sample

To gather our data, we first identified a pool of universities that may host an IS doctoral program. Searching through the AIS member directory, we identified approximately 1200 representative universities and higher education institutes. Next, using the schools' website, we determined whether the university hosted a doctoral program in IS or not. This process reduced the number of representative schools to 100, mostly located in Europe and North America, with a few in Asia and Oceania. We emailed either the doctoral program coordinator, the department chair, or an IS faculty member—whomever there existed contact information for—explaining the purpose of the research and soliciting the syllabi of introductory doctoral seminar(s) in IS.

Thirty-three schools responded to the solicitation email; among these were schools in Europe, North America, and Oceania. The solicitation process resulted in 15 syllabi from 14 PhD programs all in North America. Several European and Oceanic respondents noted that they did not have an introductory seminar for PhD students: they explained that they follow a different format for PhD education. Among these respondents, at least, it appeared that the typical European PhD format did not require standard coursework.

IV. RESULTS

Researcher Recognition

This section reports normal and weighted normal counts and rakings based on two criteria: the number of times that scholars' papers appears in the syllabi database, and the unique number of papers associated with scholars in the syllabi database. To illustrate, imagine that researcher X may have an influential work titled Z that appears in many of the collected syllabi, while researcher Y has many papers with different titles that appear in the database but not a single dominant work.

Table 1 presents the rank order of the top 25 scholars that contribute the most to IS doctoral education according to the total number of times their name occurred in our dataset. For example the normal count for Izak Benbasat was 76, which means there were a total of 76 scholarly works (i.e., book chapters, papers, books, etc.) in which he was an author of a work referenced in one or more of the 15 syllabi.

Table 2 presents the rank order of the top 25 IS scholars who contributed to the IS doctoral education in terms of diversity of knowledge. Table 2's normal count column represents how many different papers from a given researcher appeared in the dataset. For example the normal count for Rudy Hirschheim was 30, which means there were 30 unique scholarly works in which he was an author in the total of 15 syllabi that we analyzed. According to tTable 1, the normal count for Rudy Hirschheim was 56. This indicates that some of his papers appeared in more than one syllabus.

Table 3 presents the rank order of the most repeated papers in MIS introductory courses syllabi up to a count of 6. The count number in this table represents the number of times that a specific paper appears in different syllabi. We chose six as the cut-off point because it indicates that the given scholarly work has appeared in at least 40 percent of the analyzed syllabi.

Table 1: Scholar Ranking Based on the Total Number of Representing Papers			
Rank	**Name**	**Normal Count**	**W. Normal Count[a]**
1	Benbasat, Izak	76	70.9
2	Hirschheim, Rudy	56	51.05
3	Orlikowski, Wanda	55	53.35
4	Robey, Daniel	46	42.85
5	Zmud, Robert	44	38.15
6	Lee, Allen	41	40.1
7	Davis, Gordon	37	31.45
8	Markus, Lynne	36	34.95
9	Straub, Detmar	31	28.15
10	Ives, Blake	30	29.7
11	Myers, Michael	28	24.7
12	Lyytinen, Kalle	23	21.2
13	Baroudi, Jack	23	19.7
14	Klein, Heinz	23	18.2
15	Klein, Katherine	22	22
16	DeSanctis, Gerardine	22	19.75
17	Davis, Fred	22	19.15
18	Weber, Ron	20	18.5
19	Keen, Peter	19	19
20	Dennis, Alan	19	17.5
21	Todd, Peter	19	16.45
22	Boland, Richard	18	18
23	Alavi, Maryam	17	16.85
24	Mason, Richard	17	16.7
25	George, Joey	17	13.1
Notes: [a] Weighted Normal Count			

Table 2: Scholar Ranking Based on the Total Number of Unique Papers			
Rank	**Name**	**Normal Count**	**W. Normal Count[a]**
1	Hirschheim, Rudy	30	26.85
2	Benbasat, Izak	25	22.45
3	Klein, Heinz	18	15.75
4	Lee, Allen	17	16.7
5	Orlikowski, Wanda	17	16.4
6	Robey, Daniel	17	16.25
7	Straub, Detmar	17	14.9
8	Markus, Lynne	16	15.55
9	Zmud, Robert	15	13.2
10	Davis, Gordon	14	12.2
11	Lyytinen, Kalle	11	9.95
12	Jarvenpaa, Sikka	10	9.55
13	Chin, Wynne	10	9.4
14	Dennis, Alan	10	8.8
15	Alavi, Maryam	9	8.85
16	Ives, Blake	9	8.7
17	Grover, Varun	9	8.1
18	Todd, Peter	9	8.1
19	Boland, Richard	8	8
20	Mason, Richard	8	7.85
21	Agarwal, Ritu	8	7.7
22	Weber, Ron	8	7.6
23	Gefen, David	8	7.4
24	DeSanctis, Gerardine.	8	7.25
25	Myers, Michael	8	6.8
Notes: [a] Weighted Normal Count			

Table 3: Scholar Ranking Based on the Total Number of Unique Papers					
Rank	**Title**	**First Author**	**Year**	**Outlet**	**Count**
1	studying information technology in organizations: Research approaches and assumptions	Orlikowski, W.	1991	ISR[2]	12
2	Perceived usefulness, perceived ease of use and user acceptance of information technology	Davis, F. D.	1989	MISQ[3]	10
3	Research commentary: Rethinking "diversity" in information systems research	Benbasat, I	1996	ISR	9
3	Research commentary: Desperately seeking the “IT” in IT research – a call to theorizing the IT artifact	Orlikowski, W.	2001	ISR	9
4	Empirical research in information systems: The practice of relevance	Benbasat, I	1999	MISQ	8
4	MIS research: Reference disciplines and a cumulative tradition	Keen, P.	1980	ICIS[4]	8
4	A set of principles for conducting and evaluating interpretive field studies in information systems	Klein, H.	1999	MISQ	8
4	Development of an instrument to measure the perceptions of adopting an information technology innovation	Moore, G.	1991	ISR	8
4	Diversity in information systems research: Threat, promise, and responsibility	Robey, D.	1996	ISR	8
5	Organizational theories: Some criteria for evaluation	Bacharach, S.	1989	AMR[5]	7
5	The identity crisis within the IS discipline: Defining and communicating the discipline's core properties	Benbasat, I.	2003	MISQ	7
5	A framework for research in computer-based management information systems	Ives, B.	1980	MS[6]	7
5	Reviewing a manuscript for publication	Lee, A. S.	1995	JOM[7]	7
5	Information technology and the structuring of organizations	Orlikowski, W.	1991	ISR	7
5	Validation guidelines for IS positivist research	Straub, D.	2004	CAIS[8]	7
5	Use acceptance of information technology: Toward a unified view	Venkatesh, V.	2003	MISQ	7
5	What constitutes a theoretical contribution?	Whetten, D.	1989	AMR	7
6	Can the field of MIS be disciplined?	Banville, C.	1989	CACM[9]	6
6	Information systems as a reference discipline	Baskerville, R.	2002	MISQ	6
6	The case research strategy in studies of information systems	Benbasat, I	1987	MISQ	6
6	Computer self-efficacy: Development of a measure and initial test	Compeau, D.	1995	MISQ	6
6	Quasi-experimentation: Design & analysis issues for field settings	Cook, T.	1979	Book	6
6	Writing the doctoral dissertation: A systematic approach	Davis, G.	1997	Book	6
6	Information systems success: The quest for the dependent variable	DeLone, W.	1992	ISR	6
6	Building theories from case study research	Eisenhardt, K.	1989	AMR	6
6	Design science in information systems research	Hevner, A.	2004	MISQ	6
6	Nothing at the center? Academic legitimacy in the field of information systems	Lyytinen, K.	2004	JAIS	6
6	Determinants of commitment to information systems development: A longitudinal investigation	Newman, M.	1996	MISQ	6

Notes: [1]The complete bibliographic reference for each paper is provided in the references. [2]*ISR*: *Information Systems Research*, [3]*MISQ*: *Management Information Systems Quarterly*, [4]ICIS1: *Proceedings of the first International Conference on Information Systems*, [5]*AMR*: *Academy of Management Review*, [6]*MS*: *Management Science*, [7]*JOM*: *Journal of Operations Management*, [8]*CAIS*: *Communications of the Association for Information Systems*, [9]*CACM*: *Communications of ACM*.

V. DISCUSSION

By analyzing syllabi for IS foundation classes at the doctoral level, we provides two new measures for ranking MIS scholars based on their contributions to new IS scholar training and education process. Further, we provide a list of

commonly used papers for education purposes that can be a source of recognition for their authors in addition to scholar rankings and a source for new syllabus development for introductory doctoral seminars in IS. These rankings can also be used in merit promotions by business colleges and be a source of recognition for senior scholars who have contributed the most to IS doctoral training. We believe this study to be the first of its kind; there is no other study providing scholars' rankings based on their contribution to the doctoral education either in IS, or in any other business field. In addition to new rankings, this work can be a stepping stone in creating new ranking measures for other fields.

Despite our earlier speculations (see Section 1), we did not find considerable number of scholarly works published in lower-ranked journals that influenced PhD education. Most of the papers that made it to our top 20 list of papers were published in top-ranked IS and management journals (according to the IS Research Ranking website) except for some papers that appeared in the *Proceeding of the ICIS*, *Communications of Associations for Information Systems*, *Communications of ACM*, *Journal of Operations Research,* and *Management Science*.

Of course, our study has several limitations. First, we based the data on a limited sample of 15 syllabi from 14 PhD schools out of 100 schools contacted. Even though we employed a systematic approach in searching for schools with an IS doctoral program, it is difficult to assess the representativeness of our sample due to the lack of information on the number of institutions that offer PhD education in the North America and elsewhere. Second, we do not know whether the programs in our sample teach these courses by strictly following the provided syllabi. The courses are supposed to be taught by following the descriptions of the syllabi, but they are subjected to change that the syllabi may not reflect. Examining the courses syllabi alone does not allow us to evaluate the effectiveness of these seminars and scholarly works presented in them. A survey to students who have taken these courses may provide more insight in how these courses help them understand the MIS field and shape their initial mindset of it. Third, in many instances there were unusual numbers of papers listed in syllabi with few cases distinguishing between mandatory and optional papers to study. We assumed that all papers listed in the syllabi were mandatory for students. However, the difference between mandatory and optional readings could be incorporated in the scoring rules and make a difference in the ratings. Finally, we collected all the syllabi used in this research from North American institutions, which introduces a regional bias. Also, some of the high-ranked researchers in this paper were among the few contributors of syllabi. As we mention in Section 3, our solicitation efforts led to only 15 collected syllabi, some of which came from programs that a few of the top authors actually teach in. Thus, our results contain the possibility of self-repot bias.

Future research could distinguish between optional and mandatory readings in order to deliver a more accurate ranking. Moreover, to further understand doctoral MIS education, future studies could go beyond introductory seminars to examine all other core courses and seminars that are offered to MIS doctoral students. Generally speaking, doctoral students are required (though apparently only in North America) to complete a list of core courses that together serve as their knowledge foundation. We expect introductory MIS seminars to have a profound impact on and to shape students' initial mindset about the field, but other core courses also play a role in this process. Thus, when students graduate, their knowledge, skills, and expertise are a function of a collection of courses that they have taken and all the research activities they have engaged in. Therefore, to capture the nature of MIS doctoral education and provide better rankings, we call for a holistic approach to investigate all the important factors that influence students.

VI. CONCLUSION

With this paper, we provide a new means to recognize productive IS scholars, specifically those who contribute to IS doctoral education. We also shed light on the most used IS papers and scholarly works among doctoral programs. We suggest that future studies should adopt a holistic approach to examining all core doctoral-level IS courses to provide a more accurate ranking of scholars, capture the state of MIS doctoral education, understand the relationship between MIS doctoral education and status of the field, and provide practical suggestions to improve doctoral education. We also call for a better scholar ranking system, using syllabi as a source of information, by including mandatory versus optional papers in the ranking system.

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Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that:

1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
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