An Assessment of Institutional Research Productivity in MIS

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Abstract

In this study, major MIS research institutions are identified and ranked based on their contributions to quality MIS publication outlets. Over 10,000 pages of research generated over the past decade (1982-1991) are credited to over 190 institutions. The top 50 institutions are ranked. The method followed is similar to other studies conducted in well-established research areas in business, such as finance, marketing and economics. The results provide objective and useful information to the profession.

INTRODUCTION

A recent feature article in the *US News and World Report* (1991) ranked 25 business schools based on a variety of factors such as academic reputation, student selectivity, graduation rate, etc. Rankings of this type, which are based primarily on opinion surveys, have frequently been conducted. While these surveys are useful, they do not necessarily reflect true assessment of quality. Factors such as general reputation of school, size of graduating body, personal loyalties to alma maters and personal experiences all potentially bias results. Thus generalizations become particularly weak when used to evaluate specific programs or departments where it is necessary to survey a large sample of experts from the program area. However, few will deny the importance of evaluating programs, as objectively as possible, in order to facilitate career choices by faculty and students, and disseminate knowledge among other decision making groups.

Leading programs are those that attract the best students and retain the most capable faculty. In many institutions, a powerful measure of faculty capability is research productivity. Productive faculty integrate their findings with those of other observers in order to further knowledge in their chosen field as well as bring current theory and practice into the classroom. Their research findings are also disseminated in significant scholarly publications around the world. Researchers and practitioners within the area learn much from the reading and subsequent discussion of findings and theories presented in these journals. Such scholarly activity brings visibility and prestige to the authors and their affiliated institutions. While it takes more than publications to make a quality program, it is certainly an important element in the equation for excellence.

There are numerous opinions in the academic world regarding the best programs in the MIS area. However, little effort has been undertaken to rigorously evaluate the field in terms of research contribution by institution. A plausible explanation of this state-of-affairs is the relative youth of our field. Many of the "core" MIS journals such as *MIS Quarterly*, *Journal of MIS* (JMIS), and *Information Systems Research* (ISR) have "come of age" only in the last eight to ten years. While such a time frame seems minute in terms of more-grounded scientific disciplines such as *economics* or *physics*, enough time has passed and enough research has been generated to pause and take note of the discipline's top centers of scholarly activity. This study undertakes such an evaluation. Similar to other studies conducted in *general business* (Niemi, 1988), *management* (Stahl, et. al., 1988), *marketing* (Hoverstad, et. al., 1991; Niemi, 1988) and *finance* (Klemkosky and Tuttle, 1977; Ederington, 1979; Niemi, 1987), this study ranks institutions based on research productivity as measured by page presence in the field's leading journals. Such assessment provides a more objective criterion on which to identify established as well as "up-and-coming" centers of scholarly research in the area of MIS.

MEASURING RESEARCH PRODUCTIVITY

The majority of prior studies surveyed credit pages of published research in selected journals to the institutions represented by the authorship (Niemi, 1987; Niemi, 1988; Hoverstad, et. al., 1991). Some studies credit the number of articles instead of pages (Stahl, et. al., 1988). Little or no rationale is given for using one over the other. If journals have a limited variance in the number of pages per article published, these two measures should be highly correlated. In either case, credit is given to an institution depending on the con-

tribution of authorship. For instance, in the case of a three author paper with two authors from institution A and one from institution B, institution A will get credit for two thirds of an article or two thirds of the pages of the article the remainder is credited to institution B.

A second difference noted in prior studies is the use of institutional productivity vs. per capita productivity. While most studies assess overall productivity credited to an institution, some studies calculate publications per faculty. In a recent article in the *Journal of Finance*, Niemi (1988) discusses his rationale for using the former measure:

> *"The research rankings of institutions reflect the total volume of published scholarship. There has been no attempt to produce rankings that take into account size differences among programs. The total volume of scholarship measure provides an accurate representation of the centers of significant research over the past decade. Unfortunately, smaller departments are not likely to stand out in this type of measure. One disadvantage of per capita indicators is their sensitivity to the work of a small number of individuals in small departments. Faculty and graduate students are more likely to be interested in leading centers of research rather than departments with high per capita levels of research. In addition, department sizes have changed considerably over the past decade and it would be very difficult to come up with an accurate annual measure of finance researchers at each institution." (pp.1390)*

The arguments of Niemi are reflected in this study. The objective is to use the department as the unit of analysis, rather than the individual. While admittedly, some departments prosper on the basis of one or two highly productive faculty, an overall measure is more useful in identifying departments that contribute the most to MIS journals. Further, the multidisciplinary nature of the field and the "housing" of MIS faculty in various umbrella departments, makes the problem of accurately identifying the relevant number of MIS faculty in each institution very difficult.

SAMPLE OF ARTICLES

Given the diversity of the MIS field, it is difficult at best to select a set of journals that is palatable to all MIS scholars. Clearly, in studies of this nature the selection of journals must be based on widespread opinion in order to eliminate biases inherently contained in self-selected samples or samples based on "expert opinion". A recent study by Gillenson and Stutz (1991) provides the objectivity and wide-ranging sample necessary to satisfy this criteria. These authors ranked 38 MIS publication outlets based on a survey of 269 AACSB accredited business schools. The resultant mean journal scores and rankings reflect the combined opinion of 135 chairmen/senior professors in the IS area. The top five research journals and their associated mean scores (4, 3, 2, 1, 0, from top to nil) according to this survey are: *Management Science* (score=3.61), *MIS Quarterly* (3.54), *Communications of the ACM* (3.39), *Decision Sciences* (2.93) and the *Journal of MIS* (2.84).

This set of journals is used in the analysis presented here. In addition, rather than assuming equal importance of each journal, the average score for each journal is used to weight the importance of each research contribution. Thus pages and articles appearing in *Management Science* are weighted higher than those of *Journal of MIS* etc. These journals reflect quality MIS outlets and also represent the consensus of prior studies (Lending and Wetherbe, 1992; Shim, et. al., 1991; Ramesh and Stohr, forthcoming; Vogel and Wetherbe, 1984; Hamilton and Ives, 1983). *Information Systems Research (ISR)*, a relatively new journal sponsored by TIMS (which also publishes *Management Science*), is also regarded by IS academics as a high quality outlet and was included in our sample with a weighting equivalent to *Management Science* (Gillenson and Stutz, 1991). Few would argue that this set of journals has played a significant role in shaping the MIS field over the past decade.

All articles from core MIS journals (*MISQ, ISR, JMIS*) were selected. Only MIS articles from *Management Science* and *Decision Sciences* were selected based on keywords. Articles that included Information Systems, MIS, DSS, Human Information Processing, Information Economics, etc., as keywords were chosen (Barki, et. al., 1988; Alavi, et. al., 1989). For *CACM*, only articles that appeared in the "social impacts of computing", "management of computing" and "human aspects of computing" were included. The classification code H (Information Systems) and K (Computing Milieu, i.e., K6: Management of Computing and IS) includes these categories. All articles from 1982-1991 were selected in the sample. Since *JMIS* started in late 1984, only articles in the 1985-1991 issues were chosen. Book reviews, dissertation abstracts, letters, opinions and editorials were excluded from the sample.

METHOD

The selected articles resulted in over 10,000 pages of research that were credited to over 190 respective institutions. Similar to previous studies, pages were credited to an author based on the proportion of authorship. In addition, articles were credited to an author on a similar basis. The disclosure of articles as an alternative measure to pages provides insight for those who might debate the validity of a page measure. (Note: A Spearman's rank correlation run on the institutional rankings based on pages and articles was computed as 0.92, significant at p=0.000). Since page and font size differed for each journal, pages were standardized as per the style of *MIS*

Quarterly. This was done by counting the number of words on 10 pages of text for each journal and dividing them by the number of words on ten pages of the *MIS Quarterly*. The pages of each journal were then multiplied by these quotients to reflect the number of "standardized pages". These could then be added among journals. An overall weighted measure was computed (in points) based on the weighting given to each journal page as indicated above.

An institution received credit for an article based solely on the affiliation listed on the publication. Some articles might have been written at one institution, yet credited to another (e.g., visiting appointments, job commitment to another institution, etc.). Given the time frame of analysis (10 years) and the large number of institutions considered, it is assumed this does not significantly bias the results (Stahl, et. al., 1988).

RESULTS

To observe overall as well as incremental changes in institutional productivity over the decade, two 5 year periods (1982-86 and 1987-91) and a single 10 year period (1982-91) were considered. Table 1 ranks the top 50 MIS research institutions. Productivity measures (number of standardized pages, percentage of total pages within period and number of articles) are provided for the complete decade and for each 5-year period. Ranks are based on the respective weighted scores for each institution. These scores are derived by multiplying the number of standardized pages by the associated journal weight. These values are then summed for each institution. For instance, 10 pages of *MIS Quarterly* of which 1/2 is authored by a faculty member of institution A would result in a score of 3.54 X 10 = 35.4 X .5 = 17.75 being added to that institution's existing sum. Current MIS faculty counts as indicated by the *1992 Directory of MIS Faculty* are also provided.

The change in rank for each institution over the decade can be seen from Table 1. The dominance of the *University of Minnesota* is apparent, with approximately 8% of total MIS page contribution for the decade examined. They are followed by *Arizona* and *MIT*, which have made contributions of about 7% and 5.5% respectively to the MIS literature. Interestingly, the top 15 institutions have contributed over half of the total pages analyzed in both time periods examined.

A Spearman's rank order correlation was computed for the two sets of institutional rankings (1982-86 and 87-91) as 0.19 (not significant at p). This suggests that the relative productivity of institutions has changed over the two periods. In fact, on observing Table 1, it can be seen that many institutions experienced large improvement (e.g., Pittsburgh, Colorado - Boulder, Georgia, SMU) or decline (e.g., Southern Cal, Texas A&M) in rank. It could be assumed that this is often due to turnover or hiring of productive faculty rather than a sudden decline in productivity of existing groups.

In all, 10,214 pages of MIS research were attributed to 195 various institutions. Broken down by time period, 3,436 pages were authored between 1982-86 and 6,778 pages between 1987-91. This represents a change of over 97%! While some of this variation can be attributed to the addition of newer journals such as *Journal of MIS* and *ISR*, the authors noted a significant increase in the number of core MIS articles appearing in "mixed" discipline journals such as *Decision Sciences*, *CACM*, and *Management Science* in the latter time period. This increase in knowledge attests to the growing importance of the discipline to business practitioners and its appeal to scholars from various reference disciplines.

CONCLUSION

Well-established research fields such as *finance*, *management* and *marketing* have continuously attempted to objectively evaluate institutional productivity within their domain. Within the field of MIS, important studies have tracked research in terms of type, quantity, and outlet (Vogel and Wetherbe, 1984; Lending and Wetherbe, 1992) In this study we compliment and extend the efforts of these works by objectively weighting article contributions based on journal quality. Doing so allows the dissemination of information that could lead to consistency in identifying major contributors to the profession. Lack of objective information could lead to misconceptions based on institutional stereotyping, parochial interests and personal experiences. This could adversely influence individual decisions that involve choice of institution.

The decade analyzed (1982-91) has been significant for the MIS field. The first International Conference on Information Systems was conducted in 1980. Since then, MIS has made progress both in terms of quality and quantity of research contribution. As the discipline has evolved, doctoral programs in MIS have increased. In addition, the core journals have become more prominent and have increased in number and size. All this bodes well for the field, its contributors and its prominence within the institution.

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Top Institutional Representation In MIS Literature

		1992-1991					1982-1985						1987-1991					
Rank*	Institution	Score**	Articles	Percent	Pages***	Percent	Rank	Score	Articles	Percent	Pages	Percent	Rank	Score	Articles	Percent	Pages	Percent	92 Faculty****
1	MINNESOTA	1893.11	30.49	7.04%	529.87	8.17%	1	669.47	12.50	7.27%	189.14	7.94%	1	1223.64	17.99	6.89%	340.53	8.31%	18
2	ARIZONA	1457.45	25.73	5.94%	465.18	7.18%	4	460.48	8.16	4.74%	150.57	6.32%	2	996.98	17.57	6.73%	314.61	7.68%	12
3	MIT	1278.64	23.32	5.38%	354.86	5.48%	3	482.43	10.50	6.11%	140.58	5.90%	4	796.21	12.82	4.91%	214.28	5.23%	10
4	TEXAS	1152.71	19.18	4.42%	320.60	4.95%	5	333.41	6.00	3.49%	105.93	4.45%	3	819.29	13.16	5.04%	214.67	5.24%	13
5	NYU	1029.99	22.99	5.31%	315.30	4.86%	2	538.05	13.00	7.56%	166.40	6.99%	8	491.94	9.99	3.83%	148.90	3.63%	18
6	GEORGIA	744.85	15.07	3.48%	231.85	3.58%	13	210.94	4.50	2.62%	67.80	2.85%	5	533.91	10.57	4.05%	164.05	4.00%	6
7	SOUTHERN CAL	649.10	12.50	2.89%	179.07	2.76%	7	294.81	6.50	3.78%	81.15	3.41%	14	354.30	6.00	2.30%	97.92	2.39%	8
8	BRITISH COLUMBIA	624.35	9.83	2.27%	151.54	2.34%	10	242.16	4.50	2.62%	68.92	2.89%	12	382.19	5.33	2.04%	82.62	2.02%	7
9	TEXAS A&M	571.57	10.74	2.48%	170.82	2.64%	9	267.10	5.50	3.20%	76.35	3.20%	19	304.48	5.24	2.01%	94.48	2.30%	9
10	PITTSBURGH	571.25	10.75	2.48%	148.08	2.28%	41	79.84	2.00	1.16%	22.18	0.93%	9	491.42	8.75	3.35%	125.90	3.07%	9
11	BOSTON UNIVERSITY	568.68	11.50	2.66%	173.16	2.67%	12	219.54	5.00	2.91%	67.51	2.83%	15	349.15	6.50	2.49%	105.65	2.58%	6
12	HARVARD	563.45	9.91	2.29%	165.83	2.56%	82	35.40	1.00	0.58%	10.00	0.42%	6	528.05	8.91	3.41%	155.83	3.80%	5
13	PENNSYLVANIA	548.00	11.50	2.66%	183.36	2.83%	87	33.40	1.00	0.58%	11.76	0.49%	7	514.60	10.50	4.02%	171.60	4.19%	5
14	UCLA	528.14	12.00	2.77%	143.61	2.22%	23	139.41	4.00	2.33%	41.03	1.72%	11	388.74	8.00	3.06%	102.58	2.50%	6
15	TOLEDO	507.37	11.50	2.66%	146.31	2.26%	29	113.28	2.00	1.16%	32.00	1.34%	10	394.09	9.50	3.64%	114.31	2.79%	6
16	CARNEGIE MELLON	489.02	8.99	2.08%	125.61	1.94%	27	118.41	2.50	1.45%	32.84	1.38%	13	370.61	6.49	2.49%	92.77	2.26%	3
17	MISSOURI ST. LOUIS	453.32	8.50	1.96%	139.62	2.15%	8	287.16	5.00	2.91%	89.00	3.74%	37	166.16	3.50	1.34%	50.62	1.23%	7
18	COLORADO DENVER	432.49	6.00	1.39%	133.80	2.06%	39	83.50	1.00	0.58%	29.40	1.23%	16	349.00	5.00	1.92%	104.40	2.55%	6
19	FLA. INTERNATIONAL	396.92	9.16	2.12%	106.37	1.64%	11	229.05	6.50	3.78%	64.00	2.69%	36	167.86	2.66	1.02%	42.37	1.03%	10
20	SMU	391.87	7.66	1.77%	112.90	1.74%	48	68.19	1.50	0.87%	24.01	1.01%	17	323.68	6.16	2.36%	88.89	2.17%	4
21	CAL IRVINE	379.78	8.00	1.85%	109.52	1.69%	15	182.97	4.00	2.33%	53.31	2.24%	24	196.79	4.00	1.53%	56.21	1.37%	9
22	HOUSTON	371.83	8.00	1.85%	108.55	1.67%	22	140.88	4.00	2.33%	45.12	1.89%	21	230.95	4.00	1.53%	63.43	1.55%	10
23	COLORADO BOULDER	355.67	6.99	1.61%	104.44	1.61%	77	41.75	1.33	0.77%	14.70	0.62%	18	313.92	5.66	2.17%	89.74	2.19%	5
24	CASE WESTERN	331.21	8.50	1.96%	95.80	1.48%	18	158.10	4.50	2.62%	44.64	1.87%	33	173.11	4.00	1.53%	51.16	1.25%	8
25	MCGILL	326.70	6.50	1.50%	92.55	1.43%	32	91.29	2.50	1.45%	26.05	1.09%	20	235.41	4.00	1.53%	66.50	1.62%	3
26	HAWAII	304.89	6.83	1.58%	92.94	1.43%	17	162.91	3.00	1.74%	51.69	2.17%	48	141.98	3.83	1.47%	41.25	1.01%	5
27	RENSSELAER	299.07	5.00	1.15%	85.49	1.32%	24	136.23	3.00	1.74%	39.49	1.66%	39	162.84	2.00	0.77%	46.00	1.12%	5
28	DARTMOUTH	298.72	5.50	1.27%	85.04	1.31%	6	298.72	5.50	3.20%	85.04	3.57%	N/R	N/R	N/R	N/R	N/R	N/R	N/A
29	INDIANA	276.13	6.33	1.46%	78.86	1.22%	16	180.54	4.00	2.33%	51.00	2.14%	64	95.59	2.33	0.89%	27.86	0.68%	10
30	TEXAS TECH	272.30	5.50	1.27%	87.50	1.35%	31	106.60	2.50	1.45%	32.36	1.36%	38	165.70	3.00	1.15%	55.14	1.35%	7
31	PENN STATE	266.65	4.99	1.15%	71.05	1.10%	46	70.27	1.50	0.87%	18.64	0.78%	25	196.38	3.49	1.34%	52.41	1.28%	6
32	NORTH CAROLINA	255.29	6.33	1.46%	69.65	1.07%	14	184.07	5.00	2.91%	51.63	2.17%	81	71.22	1.33	0.51%	18.02	0.44%	N/A
33	SUNY ALBANY	250.48	5.50	1.27%	72.36	1.12%	19	154.04	3.50	2.04%	46.20	1.94%	63	96.44	2.00	0.77%	26.16	0.64%	3
34	TEL AVIV	246.30	6.50	1.50%	72.42	1.12%	49	67.26	1.50	0.87%	19.00	0.80%	28	179.04	5.00	1.92%	53.42	1.30%	N/A
35	LAVAL	243.31	5.00	1.15%	71.79	1.11%	64	49.56	1.00	0.58%	14.00	0.59%	26	193.75	4.00	1.53%	57.79	1.41%	7
36	NAVAL POSTGRAD.	241.65	5.00	1.15%	77.64	1.20%	76	41.82	1.50	0.87%	13.44	0.56%	23	199.83	3.50	1.34%	64.20	1.57%	13
37	AMERICAN UNIVERSITY	241.49	4.50	1.04%	67.96	1.05%	21	149.45	2.50	1.45%	41.96	1.76%	67	92.04	2.00	0.77%	26.00	0.63%	7
38	SUNY BUFFALO	228.86	4.66	1.08%	67.60	1.04%	40	81.77	2.00	1.16%	24.62	1.03%	45	147.09	2.66	1.02%	42.98	1.05%	6
39	COLORADO COL. SPRINGS	221.95	5.50	1.27%	69.77	1.08%	36	84.96	2.00	1.16%	24.00	1.01%	50	136.99	3.50	1.34%	45.77	1.12%	6
40	OAKLAND	209.11	3.75	0.87%	50.19	0.77%	65	49.56	1.00	0.58%	14.00	0.59%	40	159.55	2.75	1.05%	36.19	0.88%	10
41	GEORGIA STATE	208.59	4.33	1.00%	57.99	0.89%	81	35.40	0.50	0.29%	10.00	0.42%	32	173.19	3.83	1.47%	47.99	1.17%	15
42	BOISE STATE	204.34	3.00	0.69%	61.60	0.95%	N/R	N/R	N/R	N/R	N/R	N/R	22	204.34	3.00	1.15%	61.60	1.50%	10
43	MICHIGAN	199.90	5.00	1.15%	58.01	0.89%	97	25.05	1.00	0.58%	8.82	0.37%	31	174.86	4.00	1.53%	49.19	1.20%	10
44	MISSOURI COLUMBIA	197.57	3.33	0.77%	57.65	0.89%	28	126.32	2.00	1.16%	38.84	1.63%	80	71.25	1.33	0.51%	18.81	0.46%	6
45	WISCONSIN Mil.	190.29	4.25	0.98%	52.92	0.82%	25	135.94	3.00	1.74%	37.38	1.57%	103	54.35	1.25	0.48%	15.54	0.38%	7
46	SYRACUSE	188.89	3.66	0.85%	57.73	0.89%	N/R	N/R	N/R	N/R	N/R	N/R	27	188.89	3.66	1.40%	57.73	1.41%	9
47	ARIZONA STATE	187.61	4.33	1.00%	55.97	0.86%	28	114.32	3.00	1.74%	35.33	1.48%	77	73.29	1.33	0.51%	20.64	0.50%	9
48	QUEENS	182.43	2.50	0.58%	46.78	0.72%	33	91.14	1.50	0.87%	26.06	1.09%	69	91.29	1.00	0.38%	20.72	0.51%	4
49	OHIO STATE	181.32	3.50	0.81%	54.54	0.84%	20	150.34	2.50	1.45%	44.31	1.86%	132	30.98	1.00	0.38%	10.23	0.25%	7
50	NORTHEASTERN	178.47	3.00	0.69%	49.40	0.76%	N/R	N/R	N/R	N/R	N/R	N/R	29	178.47	3.00	1.15%	49.40	1.21%	8

* Only the top 50 institutions are ranked in a particular time period. N/R indicates that the institution was not in the top 50 during that period.

** Score based on weighting of journal importance see Gillenson & Studz (1991).

*** Pages are standardized per word count of MIS Quarterly.

**** Counts obtained from 1992 Directory of MIS Faculty. McGraw Hill/MISRC. N/A indicates faculty count not available. Counts include Full, Associate, & Assistant professorships as well as PhD faculty in "MIS" department.