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# Information Systems in Academia: Where are the Faculty?

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## Abstract

This paper takes an historical perspective and looks at the changes in the departmental home for the study of information systems from 1983 through 1995. The proportion of IS faculty located in autonomous IS departments decreased from 1983 to 1995. There was no significant change in the proportion of IS faculty in computer science and engineering departments while the proportion with management sciences and related fields increased from 1983 to 1989 but decreased slightly in the 1990s. There were significant increases in the proportion of IS faculty housed in primary value chain (management, marketing, operations), interdisciplinary, and finance departments and a significant decrease in accounting departments from 1983 to 1995. Departmental structure, therefore, did not reflect the establishment of IS as a fundamental theoretical discipline distinct from its reference disciplines. Changes in departmental structure did parallel the evolution of information systems use in business as the focus of information systems applications shifted from support to primary activities.

## Introduction

There has been little consensus on the optimum departmental structure for the study of information systems. Some universities have established separate IS departments; others have included IS faculty in departments such as computer science, management sciences, accounting, management, etc. This parallels a lack of consensus on the best organizational structure for information systems in business. Businesses have both centralized and decentralized information systems departments; IS managers have reported to CEOs, CFOs, Division Directors, Operating Managers, and others.

The literature has debated the question of whether IS has evolved into a unique discipline separate from its reference disciplines (Alavi & Carlson, 1992; Benbasat & Weber, 1996, Culnan et al., 1993; Robey, 1996; Swanson & Ramiller, 1993; Weber, 1987). We expect that the evolution of information systems as a fundamental discipline would be reflected in a shift of IS faculty from reference discipline departments to separate information systems departments.

In addition to setting research standards, academic departments manage curriculum and serve professional business interests. We expect that choices regarding the academic home for the discipline are driven not only by the theoretical basis of the research, but also by the "practitioner needs" of the professional business community. We expect that the changing nature of information systems applications impact the location of teaching interests. As applications evolved from support activities to more strategic systems, we expect that information systems faculty moved into departments focusing on primary value chain activities.

Diversity in information systems research has been both the reality and the accepted norm in the information systems discipline (Benbasat & Weber, 1996). We believe that this diversity is influenced by the fact that there is no definitive academic home for this discipline. Since academic departments provide the standards for promotion and tenure, academic affiliation is expected to impact the type of research that is performed. Understanding the source of this diversity is important because it has both threatened and advanced the field (Benbasat & Weber, 1996; Robey, 1996). IS has a tenuous stature within academic institutions today (Robey, 1996); academic research has been criticized for lacking a paradigm, with neither direction nor cumulative tradition (Weber, 1987). Restricted academic budgets have put pressure on some IS departments from peer units (Couger et al., 1995). Senior IS academics have joined other disciplines or at least developed a growing affinity with other disciplines, often changing their departmental allegiance, motivated by disillusionment with the diffuse state of IS research and the disciplines' failure to articulate a core identity (Benbasat & Weber, 1996). On the other hand, diversity in IS research expands the foundation of knowledge, attracts good people, fosters creativity, and advances the valued principle of academic freedom (Robey, 1996).

This paper takes an historical perspective and looks at the changes in the departmental home for the study of information systems from 1983 through 1995. Our objective was to see whether these changes: (1) supported information systems' evolution as a unique field of study separate from its reference disciplines, and (2) reflected a movement that paralleled the introduction of applications supporting the primary value chain functions. By reviewing these changes, we can better understand the evolution of the discipline as a field of study as well as the intellectual relationship between IS and other academic disciplines. We believe that analysis of the location of IS academics contributes to an understanding of the sources of the theoretical diversity of research in this field.

## Research Perspective

"Information systems, as an academic field, encompasses two broad areas: (1) acquisition, deployment, and management of information technology resources and services (the information systems function), and (2) development and evolution of infrastructure and systems for information use in organization processes (systems development)." As a field of academic study, it has had a number of different labels, now considered equivalent, that reflect its historical development: information systems, computer information systems, information management, information technology resources management, information resource management, management information systems (Couger et al., 1995). The context of information systems is an organization and its systems. It differs from computer science, whose emphasis is on algorithms and system software (Couger et al., 1995), and from management science, which focuses on problems, models, and solvers, and the relevant information in a problem context (Culnan et al., 1993). Organization science focuses primarily on individuals, organizations, and institutions whereas information systems is primarily concerned with behaviors and attitudes of information systems users and the role of the social context of the information system.

Since 1980 a number of studies have examined the progress of MIS as a scholarly field of study (Culnan & Swanson, 1986; Culnan, 1986, 1987; Culnan & Swanson, 1993; Swanson and Ramiller, 1993). Culnan's series of studies concluded that MIS, while still pre-paradigmatic, emerged as a distinct field of study with its own cumulative tradition from a supporting base of three foundational fields: computer science, management science, and organization science (Culnan 1986, 1987; Culnan & Swanson, 1986; Culnan et al., 1993). Swanson & Ramiller's review of submissions to ISR in 1987-1992, however, concluded that there were still no major paradigms or foundations particular to IS. They concluded that IS researchers still borrow from reference disciplines more than they contribute to the core literature of reference disciplines. IS doctoral students often minor in the reference disciplines of computer science, management science, and management (Jarvenpaa et. al., 1991).

Several researchers have lamented the lack of theory and paradigms in the IS field (Alavi & Carlson, 1992; Benbasat & Weber, 1996; Weber, 1987). Weber suggests that IS literature has ignored the primacy of paradigms, "content to be seduced by excitement of new technology." (Weber, 1987) The level of diversity in problems addressed, theoretical foundations and reference disciplines, and data collection and analysis methods is problematic to the future of IS as a discipline (Benbasat & Weber, 1996). However, others advocate greater pluralism, more diversity, greater use of methods that allow researchers scope for interpretation, and adoption of theoretical perspectives not founded on a rational and mechanistic view of the world (Banville & Landry, 1989).

## Teaching Perspective

The state of the field is strongly influenced by the fact that "MIS is not purely academic,…MIS departments are to a large extent vocational schools in that their graduates are eagerly recruited by a supportive business community…" (Banville & Landry 89, p. 57). Faculty in professional schools have been torn between the worlds of practice, education, and scientific disciplinary research (Rice & Richlin, 1993). MIS research has been found to be closely associated with practice (Alavi & Carlson, 1992). Faculty in fields who continue in their professional practice have focused on what would improve professional practice (Rice & Richlin, 1993). The pursuit of knowledge may not be best organized according to discipline-based departments (Rice & Richlin, 1993).

IS curricula in many universities are not well aligned with business needs (Lee et al., 1995; Maier et al., 1996; Maglitta, 1998). One of the key difficulties is keeping up with the constant changes in business use of IS. This has resulted in an evolution not only in the skills required by IS professionals, but in the approach to management of IS and its organizational home (Applegate et al., 1999). During Era 1 (1950s to the early 1970s) most data processing functions were established as part of accounting or financial organizations. In Era II (1970s and 1980s) some organizations moved IS expertise out into their business units. However, since Era 1 applications were still important to the success of businesses, many IS organizations remained in financial units. In most cases IS individuals in operating units still reported to a central IS function. During Era III (1990s), the trend to move IS functions out to the user community accelerated (Couger et al., 1995). In some cases, these applications transformed internal organizations and functions, and IS functions were established within operating units. In other cases uses of technology transcended traditional company or industry boundaries, so that IS organizations were moved upward. As the strategic importance of IS grew, "More chief information officers are reporting directly to chief executive officers, rather than to lower-level executives (Lancaster, 1998). In today's Era IV, administration of the IS function is more collaborative. IS functions within individual units are often supplemented with more central functions to enable this collaboration. IS curriculum has had to continually evolve to develop graduates with the skills to manage the new types of applications introduced in each era and work in information systems organizations that have had different types of responsibilities.

## Research Hypotheses

We believe that professional academic research institutions serve two primary purposes: (1) educate future professionals and (2) further the state of research. We would expect, therefore, that the academic home of a field of endeavor would reflect both the needs of the profession and the research affinities of that discipline. Since both the requirements of industry and the evolution of academic research in this new discipline underwent significant change in the period from 1983-1995, we would expect changes in its academic affiliations.

We expect that academic home would be driven by the research roots of the discipline and would evolve with the theoretical basis of the field of study. Thus, we would expect that early in the evolution of information systems as a discipline of study, researchers would be found primarily in the reference discipline departments, in particular, computer science and decision sciences. As the discipline established its own identity as an academic field of study, we would anticipate that separate departments of information systems would evolve. This leads to hypotheses 1-3 shown in Table 1.

Table 1.  Research Hypotheses

| H1 | As the discipline of information systems evolved and established its own body of knowledge and academic research community, the proportion of IS faculty in standalone information systems departments increased. |
|----|----|
| H2 | As the discipline of information systems evolved and established its own body of knowledge and academic research community, the proportion of IS faculty housed in computer science departments decreased. |
| H3 | As the discipline of information systems evolved and established its own body of knowledge and academic research community, the proportion of IS faculty housed in the reference discipline departments of management sciences/decision sciences/quantitative methods decreased. |
| H4 | As information systems evolved to support primary value chain activities, the proportion of IS faculty housed in primary business functions such as management, marketing, and operations management increased. |
| H5 | As information systems evolved to support primary value chain activities rather than accounting support functions, the proportion of IS faculty housed in accounting departments decreased. |
| H6 | As strategic cross-functional systems evolved, the proportion of IS faculty in interdisciplinary departments increased. |

We would also expect that professional and curricular needs would impact the academic home of information systems. This would suggest that the academic home of information systems should be aligned with the evolving use of technology in the business community, enabling development of curriculum to meet these constituents' needs. As information systems have evolved through the years from accounting control systems and support systems in the 1970s and early 1980s to manage the effectiveness of individual business functions in the primary value chain in the mid to late 1980s, we expect that information systems faculty moved from accounting departments to the primary business functions such as management, marketing, and operations. Moreover, accounting information systems has grown as a separate field of study within accounting departments so we would also expect a decrease in the proportion of management information systems faculty in accounting departments. This leads to hypotheses 4 and 5 shown in Table 1.

In addition, in the 1990s organizations moved from custom development of systems to the purchase and integration of information systems. When information systems are purchased, there is less need for algorithmic development and technical issues so less focus on computer science issues and quantitative modeling is expected, contributing to the move of information systems from computer science and decision sciences, further supporting hypotheses H2 and H3.

In the late 1980s and early 1990s, more cross functional and strategic systems evolved. We would expect that the study of information systems could be accomplished in more cross functional organizations which leads to hypothesis 6 shown in Table 1. However, since many academic institutions remain functionally organized, we expect that IS academics are also housed in either IS departments (H1) or primary value chain departments (H4).

## Data and Results

Data were obtained from the directories of Management Information Systems faculty in the U.S. 1983, 1989, and 1995 (DeGross et al., 1983, 1989, 1995). This limits our population to those faculty that chose to register in these directories. Since some faculty may have chosen not to be included in these directories, we recognize that there may be a bias in our sample. In particular, faculty in accounting information systems may not be registered in directories of MIS faculty as they may consider accounting as their primary professional affiliation. Departmental home was classified into one of nine categories based upon the title of the department: (1) Information Systems (including all equivalent labels noted above); (2) Decision Sciences, Management Sciences, Quantitative Methods, Operations Research; (3)

Table 2:  Location of IS Departments

| Type of Department | Schools | | | | | | Faculty | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1983 | | 1989 | | 1995 | | 1983 | | 1989 | | 1995 | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| InformationSystems. | 37 | 31 | 103 | 24 | 133 | 30 | 212 | 45 | 611 | 34 | 753 | 38 |
| Computer Sci/Eng | 10 | 8 | 28 | 7 | 20 | 4 | 19 | 4 | 87 | 5 | 83 | 4 |
| DecSci/MgtSci/QM | 28 | 23 | 86 | 20 | 92 | 21 | 105 | 22 | 473 | 27 | 509 | 26 |
| Accounting | 18 | 15 | 33 | 8 | 36 | 8 | 53 | 11 | 130 | 7 | 131 | 7 |
| Mgt/Mktg/OM | 18 | 15 | 82 | 19 | 92 | 21 | 50 | 11 | 254 | 14 | 284 | 15 |
| Finance | 0 | 0 | 7 | 2 | 8 | 2 | 0 | | 23 | 1 | 29 | 1 |
| Business/Interdisp. | 9 | 7 | 77 | 18 | 63 | 14 | 23 | 5 | 186 | 10 | 169 | 9 |
| Other | 1 | 1 | 2 | 1 | 0 | | 6 | 1 | 7 | 1 | 0 | |
| Total | 121 | | 421 | | 445 | | 469 | | 1775 | | 1959 | |

Accounting; (4) Management, Marketing, Operations Mgt.; (5) Computer Science, Engineering; (6) Finance, (7) Business, Administrative Science, Interdisciplinary, (8) Other (Social Sciences, Urban and Public Affairs, Communications) (9) No department listed.

Results are shown in Table 2. The primary location of IS faculty in the U.S. is in departments that specialize in information systems. In 1995, approximately 30% of all schools with IS faculty had a department dedicated to information systems, employing 38% of the IS faculty, with an average of 6 IS faculty in the department. The next most popular locations for IS faculty were in Departments of Decision Sciences and Quantitative Methods and in Departments of Management, Marketing, and Operations. In 1995, approximately 21% of all schools with IS faculty housed them in each of these departments.  However, Decision Science departments tend to have more IS faculty than the primary value chain departments (Management, Marketing, Operations), on average, 6 and 4 faculty, respectively. Decision Sciences Departments housed, in total, 26% of all IS faculty while Management, Marketing, and Operations Departments housed 15% of all IS faculty.

Trends over time are shown in Figure 1 which display the percentage of faculty in the different categories of departments. For each category, the sample proportions in each year were compared pairwise. The difference in sampling proportions is assumed to be normally distributed with sampling from binomial populations. The significant differences at the 5% level are summarized in Table 3.



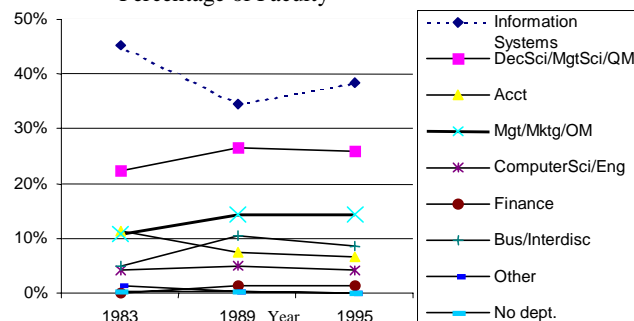Figure 1. Location of IS Faculty by Department: Percentage of Faculty

Table 3. Significant Changes in Proportion of IS Faculty Housed in Departments:1983-1995*

| Department | 1983-1989 | 1989-1995 | Overall: 1983-1995 |
|---|---|---|---|
| Information Systems | Decreased Z=-4.31** | Increased Z=2.54 | Decreased Z=-2.69 |
| Computer Sci/Eng | | | |
| DecSci/Mgt Sci/QM | Increased Z=1.88 | | |
| Accounting | Decreased Z=-2.80 | | Decreased Z=-3.39 |
| Mgt/Mktg/ OM | Increased Z=2.95 | | Increased Z=2.17 |
| Finance | Increased Z=2.48 | | Increased Z=2.65 |
| Business/ Interdisp. | Increased Z=3.70 | Decreased Z=-1.93 | Increased Z=2.68 |

*Significance level = 5%
**Z= normalized variable for difference in population percentages

Results are summarized in Table 4. They provide support for the significant increase in schools housing IS faculty in primary value chain and interdisciplinary departments. The trend towards housing IS with primary rather than secondary business functions (especially accounting and information systems) occurred primarily during the 1980s. This reflects the shift in emphasis in business, supporting the theory that the curricular needs of the profession strongly influence the organizational home of the field of study.

Table 4. Results of Hypothesis Testing

| | Description | Results |
|---|---|---|
| H1 | Proportion of IS faculty in **standalone IS** departments *increased.* | Contradictory |
| H2 | Proportion of IS faculty housed in **computer science** departments *decreased.* | No support |
| H3 | Proportion of IS faculty in **DecSci/MgtSci/QM** *decreased.* | Contradictory |
| H4 | Proportion of IS faculty in **primary value chain** *increased.* | Yes |
| H5 | Proportion of MIS faculty in **accounting** departments *decreased.* | Yes |
| H6 | Proportion of IS faculty in **interdisciplinary** departments *increased.* | Yes |

An interesting result is the lack of support for the movements of IS faculty that would be expected based upon the theoretical emergence of IS as a separate discipline from its reference disciplines. The proportion of all IS faculty in standalone IS departments has not increased, in fact it has decreased as IS faculty have moved into other departments, primarily those that reflect shifts in business. There was, in fact, a decrease in the number of faculty in standalone departments through the 1980s with some increase in the number of faculty in these departments in the early 1990s, but overall the proportion of IS faculty housed in standalone departments has decreased. While standalone information systems departments still house the largest proportion of IS faculty, the proportion of faculty in these departments has decreased.

There is not any support for the theory that faculty moved from the reference disciplines to standalone information systems departments as the discipline emerged. In fact, the proportion of total faculty housed in computer science has not significantly changed. This would suggest that there are still a number of faculty working in the more technical areas of information systems in computer science because there is still much fundamental technical research that requires computer science skills. The proportion of IS faculty in

management sciences, decision sciences, or quantitative methods departments actually increased in the 1980s. Rather than move information systems academics to standalone departments, they may have simply hired more IS faculty into these departments as the need for IS faculty increased.

## Conclusions and Future Research

This work provides an historical perspective on the evolving location of information systems departments in academia during a time period when the number of programs and faculty in information systems grew significantly. Some decisions about the academic home of information systems may have been driven by the evolution of the use of information systems in business. There is no support for the evolution of IS as a distinct discipline of study.

Our research assumed that the location of information systems academics is driven by the theoretical basis for IS research or pressures from practice. We have not considered internal academic politics or financial pressures as driving forces for academic structures, which is a threat to the validity of this study. For example, politically strong departments in the reference disciplines may have fought the loss of faculty to standalone information systems departments. Financial constraints may also have limited the number of departments. Future research will attempt to gather this information via interviews with faculty.

It is generally expected that the organization of schools offering higher degrees, e.g. PhD, may be driven more by theoretical evolution of the field compared to schools that offer only B.S. degrees. We would like to investigate whether there is any relationship between the highest degree offered and the home of the academic department.

We believe that organizational home has an impact on the type of research that is produced. Since academic departments generally have strong input to promotion and tenure decisions, we would expect that they would choose to publish articles related to the basic discipline of the department in which they are located in journals widely accepted by those departments. For example, we would expect more information systems faculty in decision science departments to publish in journals such as Decision Sciences whereas information systems faculty in management and marketing departments might choose to publish more in management and marketing journals. We plan to test this hypothesis by analyzing the publication outlets of IS faculty in different departments.

This research has suggested that professional use of information systems in business organizations has had an impact on selection of the academic home of information

systems. Historically, the reference disciplines have also provided a home for academic study of information systems. There is no strong evidence that the evolution of information systems as a fundamental field of study has contributed to the establishment of separate academic departments of information systems. This suggests that future research will continue to have much theoretical diversity. We also expect that more research will be wedded to the primary business functions.

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