The Current Status of the IS Discipline: A Survey of American and International Business Schools

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Questions of IS's status as an academic discipline have been debated within and outside the IS community since the inception of the field. Strangely, members of the IS community find ourselves asking those same questions as did our peers some 25 years ago. The community has answered critical questions relating to reference disciplines, dependent variables, and the building of a cumulative tradition. Yet we are still grappling with such issues as our status in relation to and interaction with other disciplines, IS practice in the business environment, the role of IS in business school curricula - and in some cases the survival of IS departments - and a new issue, our place in the developing international business arena. This study surveyed over 1,000 business school deans and IS department heads in the United States and over 50 overseas countries to determine the current status of the IS discipline. The survey queried respondents concerning the status of IS curricula and research issues in their institutions. Analysis indicates that differences exist between academic methodology in North American and International institutions in both curriculum and philosophical approaches to degree requirements. Universally, IS scholars believed that the future of IS as an academic discipline is more certain than in the field's early years, although there is a wide range of opinions as to the optimum areas for academic exploration.

During the first ICIS convention in 1980, Peter Keen posed questions that have helped define the field of information systems (IS). Interestingly, IS scholars are today pondering some of the same questions proposed in 1980 and are additionally attempting to assess the field's academic status, both current and future. Bill King, in his solicitation for members in the newly founded Association for Information Systems, noted that the academic community, particularly deans, does not recognize the importance of the IS discipline. Many IS departments and faculty members are concerned about the perceived status of IS given the current situation of declining enrollments, budgetary pressures, and the lack of inclusion of IS in the new American Assembly of Collegiate Schools of Business (AACSB) standards for core education. As a result, programs are being adapted to meet changing market demand and produce students who better meet the needs of the dynamic global environment -- a world where all national economies depend on global markets, material sources, and production.

In his keynote address to the first annual Association for Information Systems, Thomas Davenport suggested that the IS discipline is at a crossroads. He stated that the IS academic community is no longer society's cognitive authority on IS topics and that we must reorient ourselves and our programs. Our research should influence practice while focusing on information and how it is used. Our academic programs fail to be responsive to the business community which we serve and currently suffer from narrow focus, are insufficiently cross functional, and topics are in decline by the time they are administratively acceptable. Lee, Trauth, and Farwell (1995) surveyed IS professionals and discerned that current IS curricula in many universities are not aligned with...

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business needs and that the concept of a generic IS curriculum is obsolete. Before any organization can determine its future course, it must assess its current strengths and weaknesses. This study seeks to investigate the current state of the IS discipline while assessing issues critical to its continued success. To assess the current status of our discipline, over 1,000 IS department heads were surveyed to answer basic questions about the discipline. The resulting descriptive study is organized as follows. The first section describes changes in business school programs and cites literature illustrating changing demands on IS graduates. The next section describes the sample frame and the development of the survey instrument. Section three reviews the first portion of the survey. This descriptive discussion analyzes the responses of the sample with regard to the current state of IS curricula, highlighting department makeup, IS infusion, course offerings, and special requirements such as internships. The role of IS departments in various institutions and perceptions of the current status of IS as an academic discipline are also investigated. Section four examines the current state of IS research and analyzes opinions of IS' future as an academic discipline. Respondents discuss major obstacles facing faculty with regard to conducting IS research and speculate about factors that will contribute to change, the future directions and research opportunities of IS, and the most likely areas for specific IS and cross-disciplinary research.

Background

Information systems as an academic discipline has been inspired by practitioners whose field has been driven by technical changes. The rate of technical change has made it difficult for practitioners to maintain the currency of their systems and has increased their reliance on academia for a pool of highly trained professionals. Academic programs are also strained as the demands to update programs, improve facilities, link with industry, and place graduates increase during times of diminished resources. During the mainframe era, IS and computer science departments produced programmers—technical experts whose management and interpersonal skills were of secondary importance to their technical skills. The widespread introduction of the personal computer (PC) into business introduced the began of a series of changes in IS education which continues today. Dickson, Benbasat, and King (1980) suggested that the basic challenge is providing rigorous and effective academic programs which will produce people who fill the need of the market place and that these needs are best filled by information system programs rather than computer science programs. Dickson et al. (1980) pointed out that IS programs of that day produced a diversified product, from "programmers" to computer-oriented management scientists to information analysts.

As PCs became a tool of business, the management and interpersonal skills of IS graduates became more important, but it was not until the late 1980s, with the expansion of corporate-wide networking and the use of information systems for competitive advantage that the strategic role of IS and the importance of the CIO became recognized. Graduates of IS programs were no longer cloistered to basements and back rooms, instead they interacted with all elements of corporations. These changes challenged academic IS programs to incorporate more "business" oriented courses into what in the past had been technical curricula. Effective IS managers are becoming more management oriented and the role of the chief information officer (CIO) has become more of a consensus builder and communicator than technical expert (Freeman, 1994; Synott, 1987). The CIO is increasingly being brought into early discussions about many critical issues facing the organization, but historically IS senior professionals emphasized technology over business needs (Emory, 1989). Curiously, a recent survey of mid-level IS professionals, rated "technical" aspects of IS education more important than "business" aspects (Richards and Pelly, 1994).

The academic environment today is as dynamic and precarious as that of the practitioner's world. Business schools of all sizes are faced with flagging interest in business, declining enrollments (AACSB, 1994; Cale et al., 1991), and budget pressures. As a result, many business schools are examining their programs and revising departments and curricula to meet changing demands. "Business schools are tackling the problem in a variety of ways. Strategies include developing special advising programs for incoming students; creating courses, minors and majors with the cooperation of other academic units; and completely redesigning existing programs to make them more relevant to the career needs of today's students." (AACSB, 1994).

At the AACSB National Conference in 1993, Alan Bailey, AACSB President, suggested that curriculum elements should have set goals and that the objectives of students should reflect those goals. Additionally, universities should provide services, including collective responsibility for learning, to support the students and the program goals. Several universities, including Indiana University and the University of Central Florida (UCF), have adapted their programs to reflect perceived student and potential employer objectives. These programs have their foundations in integral student competencies. For instance, UCF's foundation is built upon teamwork, communication, creativity, and adapting to change. This program has extended its reach by enlisting corporate partners such as Walt Disney World, General Mills, and AT&T (AACSB, 1994).

Today, IS programs are again being challenged by technology-driven change. The growth of the Internet, and its incorporation into business methods, is changing the way business operates. These changes combined with increased scrutiny of academic budgets is causing a reassessment of many programs. The goal of this research is to understand the
current status and future directions of IS as an academic discipline.

Sample Frame, Survey Instrument, Analysis

Methodology

The sample was selected to focus on educational institutions with degree programs in business drawn from the U.S., Canada, Latin America, West Europe, Japan, and other key countries; over 50 countries were included in the survey. The sample was constructed from sources including the educational membership of the American Assembly of Collegiate Schools of Business (AACSB) and Consejo Latinoamericano de Escuelas de Administración (CLADEA), official German and Japanese listings of degree-granting institutions, Europa’s World of Learning, 41st edition, 1991, and the Directory of Management Information System Faculty. Institutions listed in more than one source (duplicate entries) were deleted. IS department heads were contacted where possible. In cases where an IS contact name was not possible (mainly outside North America), packages were sent to the Dean of the Business School with a cover letter requesting that the survey instrument be forwarded to the appropriate member of the faculty. The resultant sample consisted of 1,047 institutions, 675 of which were located in North America (U.S. and Canada).

A total of 523 usable responses were received resulting in a response rate of 49.95%. North American responses totaled 393 (58.2% response rate) while international responses equaled 130 (35.0% response rate). A listing of respondents' countries of origin is located in Appendix A. The international response rate is exceptional considering the difficulty in sampling the international arena. Problems include the reliability of the international postal system, varying language capabilities of foreign respondents, and cultural responsiveness of faculty (Goslar and Deans, 1994). The questionnaire was adapted directly from the instrument utilized by Arpan et al. (1993) who successfully surveyed global institutions on behalf of the AACSB to determine the internationalization of business education. Their survey instrument was developed utilizing a panel of experts (from the academic and the business environment). The instrument for this study is a shortened version of their form adapted to reflect both the technical language and dynamic nature of the IS discipline. The adapted instrument was reviewed by a panel of experts, both academic and practitioners in IS and international business. Academic advisors reviewed the instrument for design and content while practitioners' comments concentrated on applicability of material. The resulting questionnaire consisted of a combination of open-ended questions which garnered the insights of the respondents and objective questions to capture quantitative information. The survey was prepared entirely in English and did not differ between the North American and International mailings. It was the opinion of the experts reviewing the instrument that English is widely used as both a primary and secondary language. Given the overall fifty percent response rate and thirty five percent international response rate, the interest in the topic outweighed the inherent problems, justifying the researchers' assumptions.

The results of closed-ended questions are presented as the percentage of respondents replying to a particular response and are segmented by North American (United States and Canada) and International scholars. To assess the degree of statistical significance between the samples, t-tests and analysis of variance (ANOVA) were conducted using the SAS statistical package. In cases where factors were independent, ANOVA using the PROC REG procedure was conducted. In these cases, once overall statistical significance was established, the significance of differences at individual levels was examined using Bonferroni confidence intervals. All analysis was initially conducted at the =.05 level unless otherwise indicated. To empirically assess, yet still retain the "richness" of the open-ended questions, the Q-sort technique was used and was verified using computer-based content analysis. Content analysis, while not widely used in IS research, has been utilized to derive interpretations from historical documents (Daft and Wiginton, 1979), corporate reports and CEO statements (Bowman, 1984), and to aid studies of organization culture (Schien, 1985). An explanation of the content analysis procedure is found in Appendix B.

Survey instruments were sorted directly instead of using index cards as is commonly found with Q-sort methodology. Forms were separated into North American and International samples and then sorted for each open-ended question. As executed by Brown (1986), Tate (1982), and Daniel (1989) responses were sorted into piles which represented the researcher's perception of the respondent's answer. The procedure was then repeated by a second researcher and their two sortings were compared. The procedure was repeated for each question. In every case but one, the researchers' perceptions of answers were correlated at or above .90 (the exception was .83). To confirm the reliability of the Q-sort procedure, the open-ended responses were entered into a computer-driven content analysis program and analyzed. The correlation between the Q-sort and content analysis exceeded .90 for all but two questions whose correlation exceeded .80.

Information System Curriculum Issues

AACSB standards for business school accreditation indicate that member schools reflect a diverse range of missions, that diversity is a positive characteristic to be fostered, and that both undergraduate and graduate curricula provide an understanding of perspectives that form the context for business, including technological issues. The standards also specify that it is not the intent of the AACSB standards to require a separate or specific course in any field, and that schools may approach any or all topics by interweav-
Is IS perceived as a separate and distinct academic discipline?

The majority of respondents, 70% North American and 77% international, believe that management information systems is a separate academic discipline with its own body of theory and empirical research (see Figure 1). The samples are statistically different rejecting the null hypothesis of equality (p-value = 0.0040). It is logical that the members of an academic community should perceive their field as distinct. McLeod (1985) found that business school deans expected IS to expand and grow in importance and that the IS area would be an area within the business spectrum that would be most likely to grow.\(^2\)

What is the location of the IS faculty in academic institutions?

The respondent schools’ organizational structures for information system expertise reflect that 50.7% of North American and 53% of International schools have separate IS departments and the view that IS is a distinct field. The location of IS faculty is another indicator of the business school’s philosophy of IS education. Figure 2 reveals that the difference between the North American and International samples is negligible. In both samples, over fifty percent of the faculty were assigned to a distinct IS Department. Over thirty percent were assigned to another functional department but recognized as IS specialists. Statistical tests could not reject the null hypothesis of equally indicating no difference in North American and international samples (p-value = 0.5136).

What is the business school’s objective for IS with regard to business majors?

The business school’s objective toward IS education establishes the baseline from which the IS curricula is created. Surprisingly, this question illustrated a major philosophical difference between North American and international schools (see Figure 3). Null hypothesis of equality of means is rejected (p-value =.0044). The North American sample was almost evenly divided (48% to 44.6%) between the students having a general awareness of IS and a basic understanding of IS as it relates to their functional area, while the international sample was heavily weighted (37.4% to 52.8%) toward students having a basic understanding as it relates to their functional area\(^4\). Under ten percent of both groups (7.3% of North American and 9.8% of International) believed that their students should develop expertise in IS as it relates to their functional area. A possible interpretation is that the international sample schools are taking a more global approach to business education by integrating IS into their functional areas.

What is the business school’s approach with regard to IS in curriculum for business majors?

Several methods could be utilized by a business school with regard to IS curriculum for business majors. The first, infusion involves the introduction of information systems...
within modified existing business courses. A second approach is to require all students to take at least one general IS course. The third approach provides a list of IS courses and allows the student to select a course. A fourth approach requires that all students take one IS course within their major field (usually taught by faculty within that field). Respondent schools were apt to require business majors to complete at least one general IS course (see Figure 4). Overall, there was no significant difference between the two sample groups (p-value=0.430), although International schools were more likely than North American schools to introduce (1) IS in core courses, (2) require students to select an IS course, or (3) require an IS course from within the major. Comments indicated that the general IS course usually introduced students to the microcomputer, teaching them to use a word processing package and offering an introduction to spreadsheets and a database package. Some courses went beyond the usual introductory information and offered students insights into networks, e-mail, and statistical packages. A common concern, noted in respondent comments, was that this type of course fails to provide the student an understanding of how critical the information systems are to the organization and what part they play in daily and strategic business operations. Other comments expressed a desire to deepen the material covered in the survey/introductory course while minimizing the "how-to" element.

Are there difference in IS Curricula and Program Offerings?

Course offerings provide insight into the commitment and specialities of an IS program. Figures 5 and 6 decompose the nature of programs. A higher percentage of the North American sample offer both general and specific IS courses when compared to the International sample cross section in every category. The greatest disparity in the percentages can be found at the undergraduate level. Twenty percent more North American schools offer IS courses when compared to the international group (p-value=.0507). It seems that the international schools concentrate IS education at the higher degree levels. This result is counterintuitive, given the reliance of these countries on integrated trade which requires higher levels of information flow; one would think there would be an inherent bias toward introducing IS at the undergraduate level. A possible explanation is that there is a higher level of IS infusion in core courses in other academic areas, which may be reducing the need for lower-level IS courses.

At the Master's and Ph.D. levels, there were no significant differences between the international and North American samples. For general IS course offerings at the Master's level, there was just over a four percent difference in the two samples, statistically insignificant (p-value=.6507). In doctoral programs, the difference between the two samples for a general course in IS was less than one percent, again the difference is statistically insignificant (p-value=.7779). The trend is similar for specialized IS courses at both Master's and Ph.D. level programs. Less than four percentage points separate the responses from North American and international programs at the Master's level. This difference is statistically insignificant (p-value=.6338). The difference between the two samples at the doctoral level is also insignificant (p-value=.5944). These findings suggest that in graduate level programs IS requirements are converging.

Specialized IS course offerings also provide insight into the direction of the program. Statistical analysis indicates that there is significant difference between the two samples, rejecting the null hypothesis (p-value=.0130). Figure 7 lists the specialized IS courses most widely offered and the results of the Bonferroni intervals indicating the significant statistical difference between individual courses offered by the two sample groups. The technical course, Database Structures and Design, is by far the most widely available course and is offered by over three quarters of the North American and sixty percent of the International sample. Telecommunications is the second most offered course of North American respondents followed by a group including IS Seminar, Strategy, Implementation, and Design & Analysis. The International schools offer Strategy, Implementation, and the IS Seminar more often than Telecommunications, Distributed...
Courses Offered | North American | International | Significance Level
--- | --- | --- | ---
Database | 75.3 | 60.0 | 0.0475
Distributed Processing | 24.4 | 16.2 | 0.0897
Implementation | 36.1 | 41.5 | 0.0737
International IS | 8.4 | 9.2 | 0.1190
Seminar | 39.2 | 36.2 | 0.0741
Strategic IS | 37.9 | 47.7 | 0.0641
System Design & Analysis | 35.9 | 16.2 | 0.0328
Telecommunications | 47.1 | 35.4 | 0.0735

Figure 7: Specialized IS Course Offerings
Percent of Respondents and Bonferroni Results

Processing and Design & Analysis, suggesting an emphasis toward more organizational and less technical programs. Many respondents stressed strengthening alliances with and surveying IS practitioners, especially CIOs and managers in charge of hiring IS personnel, so that course offerings could be compared to the practitioner's perceived needs.

There is general agreement among respondents that there will be a need for IS professionals to support the growing number of end users despite technology's move towards transparency, and that these IS professionals will be people with BS/MS degrees and not "trade school" graduates. This finding was confirmed by Lee et al. (1995). A recurring comment was that "developing and maintaining IS courses is like hitting a moving target." Many programs update courses on an annual basis, requiring close faculty interaction with the IS service industry, extensive reading of both academic and practitioner publications, and maintenance of skills via the attendance of technology-oriented workshops as well as academic and industry conferences.

Infusion of IS Content of Core Business Courses

Infusing courses with IS content means that information of an IS nature has been integrated as part of this course. An example of this is a marketing course that utilizes specific case studies of how information systems have improved a firm's market share or are used as a marketing tool, e.g., a bank ATM. Analysis found significant differences between the two samples (p-value=.0004). Figure 8 shows the percent-age of respondents whose functional areas were infused with IS content. The figure also indicates significant difference (results of the Bonferroni internals) between the individual areas of the two samples. Accounting courses have the greatest level of IS infusion. This comes as no surprise, since accounting applications were some of the earliest computer applications, and IS-related articles have been found in accounting publications for many years. Organizational based functional areas - marketing, finance, and management - are also infused with IS content. This reverses a finding by McLeod (1985) which ascertained that IS received very little emphasis in other areas. Members of the IS community might suggest that at last our field is being recognized as an independent discipline because these other disciplines are using our information base as a reference area. High levels of infusion of IS content into other functional areas can be considered consistent with business schools' objectives and goals of developing a general awareness or basic understanding of IS as it relates to a student's functional area, rather than developing an expertise in IS.

IS Degree Programs

Degree programs are an additional means for measuring the penetration of information system education at the university level. Figures 9 and 10 illustrate that the North American schools have a higher percentage of IS major and minor program courses of study at the undergraduate level (p-values equal .0007 and .0013 respectively). The percentage of programs for the Master's and Ph.D. levels are approximately the same for the entire sample. There was no significant difference between the two samples at the Master's level (p-values equal .6579 and .5979 respectively). At the doctoral level, programs results were insignificant for IS major programs (p-value=.7990), but were approaching significant difference for IS minor programs (p-value=.0699). This is representative of the course offering findings and could be explained by the higher level of IS infusion in core courses in

![Figure 8: Core Courses Infused with IS Content Percent of Respondents and Bonferroni Results](image)

![Figure 9: IS Major Programs](image)
The final questions in this section relate to the use of special requirements to ensure the success of IS graduates. Although no single program is universally accepted, schools across the entire sample offered various programs to improve student job placement, including emphasis on special skills or particular areas. The surprising difference between the samples is the use of internships. Over 40 percent of North American schools placed their students in internship programs compared to only 13 percent of international schools (Null hypothesis of equal means rejected p-value=0.0044). While internships are not without problems\(^\text{6}\), they do provide one method for introducing students into the workforce while enhancing the academic-practitioner alliance. An example can be drawn from the most successful programs in the international business area\(^\text{7}\). These programs require their students to work for up to a year in businesses in their country of specialization and as a result of their experience, a greater percentage of these students find themselves in higher demand than students in programs with no internship requirement. At least one school, Old Dominion University, has proposed that every undergraduate be required to participate in a one-semester internship (Carino, 1994). Internships for IS majors could provide a two-way street for IS programs in business schools. First, students would learn and apply their skills on-the-job and many could eventually gain employment with those firms or be more employable in the general job market. Improved placement of IS graduates would make the IS department more viable when compared to other areas, assuming that other functional areas could not improve their student placements. Second, the IS department would have a window into the IS business community. This window could provide IS academics with improved contacts with their practitioner counterparts and have the potential for expanding both research and funding opportunities for their university.

**Information System Research Issues**

Faculty members should make intellectual contributions on a continuing basis appropriate to the school’s mission. The outputs from intellectual contributions should be available for public scrutiny by academic peers and practitioners (AACSB, 1993). The accreditation standards interpret intellectual contributions as a composition of (1) basic scholarship - the creation of new knowledge, (2) applied scholarship - the application, transfer and interpretation of knowledge to improve management practice, and (3) instructional development - the enhancement of the educational value of instructional efforts of the institution or discipline. The outputs from intellectual contributions as further defined by the accreditation standards include publications in scholarly journals including refereed journals and proceedings, professional and trade publications, and textbooks and instructional software. The common factor across intellectual contributions is the necessity of research required to produce high quality, publishable results. This research allows IS faculty to maintain their academic status as preeminent educators and helps to maintain currency within the rapidly changing discipline. This section explores the responses of the open-ended questions which composed the research portion of the questionnaire.

**Obstacles Hindering IS Researchers**

Major obstacles are inevitable when undertaking any endeavor, and academic research is no exception. The sample

<table>
<thead>
<tr>
<th>Obstacle</th>
<th>North American</th>
<th>International</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty doing research</td>
<td>28.0</td>
<td>24.6</td>
<td>0.0840</td>
</tr>
<tr>
<td>Difficulty publishing</td>
<td>22.4</td>
<td>13.9</td>
<td>0.0491</td>
</tr>
<tr>
<td>Insufficient funding</td>
<td>59.2</td>
<td>54.0</td>
<td>0.0730</td>
</tr>
<tr>
<td>Insufficient interest</td>
<td>13.0</td>
<td>11.6</td>
<td>0.0649</td>
</tr>
<tr>
<td>Perception of value</td>
<td>17.2</td>
<td>17.7</td>
<td>0.0968</td>
</tr>
<tr>
<td>Time</td>
<td>38.8</td>
<td>34.6</td>
<td>0.0779</td>
</tr>
</tbody>
</table>

**Figure 11: Obstacles to IS Research**

Percent of Respondents and Bonferroni Results
of IS scholars was in general agreement with regard to specific obstacles that impeded their research, although overall the two samples are statistically different (p-value=.0003). By far, the major obstacle to IS research was insufficient funds (59.2% International and 54.0% North American respondents). Time was the second greatest obstacle to conducting quality research (38.8% North American and 34.6% international respondents). See Figure 11 for comparisons and statistical differences. Many respondents commented that there are actually three time constraints to contend with - time required to conduct the research, time delays getting results published (especially in refereed journals), and the time pressures of topic obsolescence in the rapidly changing technical environment. The other major obstacle blocking academic research is the difficulty conducting research (28.0% North American and 24.6% international respondents). This is also of little surprise as the discipline strives to improve the quality of intellectual contributions while attempting to make contributions more applicable to practitioners. Respondents suggested that it is also becoming more difficult to conduct research in the business environment as officials are barraged with many requests to answer surveys, and are reluctant to allow “outsiders” to work within their organizations and have access to systems that may provide competitive advantage.

**IS Research Directions**

IS research has been characterized by a diverse range of topics and interests while being driven by emerging technologies. Respondents suggested a broad scope of potential research directions. No one area or areas emerged as universally promising to all scholars. Some of the most popular topics included training/retraining and management of IS professionals, object oriented systems analysis, business process redesign/downsizing/organizational design, international (global) and strategy issues, end user computing, cognitive aspects (psychology), information super highway/Internet/emerging technologies/EDI, neural networks & AI, and IS focus for the small and medium firm. One pragmatic respondent suggested that he would “be interested in whatever topics would achieve publication in *Management Information Systems Quarterly, Journal of Management Information Systems,* and *Information System Research.*” An interesting trend, though not statistically confirmed, in the international responses was that suggestions from Asian schools were more technically oriented, while European schools were focused more on organizational issues.

Expanding cross disciplinary research garnered near universal support from the respondents. IS, especially in the global arena, is viewed as the “glue” that holds many widely dispersed and diversified organizations together. Several respondents suggested that IS is the best platform from which to unify other academic fields of research. Many of our peers are currently planning or have future plans, to engage in cross disciplinary projects. Areas deemed promising for these endeavors include accounting, economics, marketing, management/organization behavior, strategy, psychology and education, as well as more traditional areas such as management science, computer science and computer engineering. These suggestions confirm Thomas Davenport’s ideas of linking our research with related areas.

Peter Keen’s questions continue to have implications for our research methodologies as our field matures. We are bound as credible researchers to consider both the quality of our work and our audience. Many of the respondents encouraged their peers to consider alternative yet still rigorous research methodologies. “It is time to move the majority of our research out of the lab,” claimed one respondent. Other comments persuade researchers to use methodologies that will be of interest to the practitioner community. Their recommendations call for increased use of techniques that include case studies, field experiments, and action research. Some respondents called for more foundation building and rigor as we strive to develop paradigms which continue the process of building our field into an “academic” discipline. As in the past, there is ample latitude for researchers to pursue both topics and methodologies within IS with regard to their personal interest.

**Conclusions**

This study surveyed over one thousand IS department heads around the globe, in order to assess the current status of the IS discipline. The overall conclusion of the survey is that on a self-reported basis, IS is a distinct academic discipline. The vast majority of the sample (78.6% North American and 80.0% International) indicated that the future of IS as an academic discipline is certain and promising. The surveyed institutions reported that, at a minimum, business majors should have a general awareness of IS with the vast majority of business schools reporting that all business majors be required to take at least one IS course. Almost half of the institutions surveyed have the objective of providing students with a general awareness of IS as it pertains to their major area, strengthening the student’s grasp of IS knowledge and application. Open-ended responses repeatedly recommended that the academic community strengthen its ties with the practitioner community, suggesting that academic-practitioner alliances could provide new opportunities to many IS programs facilitating avenues for funding, experimentation, and career tracks for students. “Direct two-way flow of information between academic scholars and practitioners must continue and expand for the discipline to develop and continue to mature,” emphasized one respondent. The results uncovered significant differences between the North American and International sample groups with respect to a school’s objective to IS, curricula and program requirements, and faculty’s perception of research obstacles. Some significant differences were discovered between the two groups in ap-
proach to IS infusion and with graduate level programs. Almost every respondent expressed the desire to perform scholarly research and publish the results.

As with the software industry operating in the changing technical environment, the IS academic community must have some benchmark against which to judge our courses. No fixed curriculum, specific program of study, or approach to instruction will suffice indefinitely. It is inadequate to compare a school’s current focus and methods to last year’s or to courses given five years ago; we must anticipate future needs and prepare our students for them. Respondents suggested that the practitioner community can supply vital input and feedback about the current state of course offerings and future requirements. Many respondents stressed pressures associated with the costs of maintaining course currency and faculty “re-education” objectives as well as the ability to acquire current materials, especially case studies. A major concern to many respondents, is the issue of “teaching versus training” where IS faculty are persuaded to “tutor” the most current software packages to students and other faculty members. IS departments should not be purveyors of low-level technical skills. Based on respondent comments, we envision scenarios where schools differentiate themselves, forming “alliances” with regional enterprises to develop expertise and courses that support those industries. This, in turn, would link the two communities, providing a necessary outlet for the IS department to test theories, place students, and receive funding while providing industry with superior students who are better qualified to meet their immediate needs. Yet some schools have chosen not to concentrate on IS or have let their IS faculty depart for various reasons. These schools will cease to be competitive relative to today’s technical business environment and will have more trouble attracting the better students.

Despite the effort of the authors to survey a comprehensive sample of business schools, many institutions and some countries were not included in the sample. Additionally, future researchers examining the IS discipline could broaden their studies by expanding their sampling to more established fields to determine the perception of our discipline from other perspectives. A recent survey of chief information officers (CIOs) and their peers found that the heads of other functional departments in the business environment had vastly different perceptions of corporate IS than did the CIO (Freeman, 1994). The authors defer suggestions and recommendations regarding specific curricula issues to the research current being conducted in that area. Reviews of IS curricula are currently being undertaken by the Association for Computing Machinery, Association for Information Systems, Data Processing Management Association, Information Resource Management Association, and International Conference on Information Systems. Initial results are reported by Couger et al. (1995). Additional studies of IS curricula can be found in the September 1995 special issue of Management Information Systems Quarterly.

As the field matures, the IS discipline will find itself with new challenges and rewards as IS faculty interact with other academic professionals and support the growing practitioner community. The need for IS will grow as the world and business within it becomes more complex and information technology continues as an integration influence between business units. The increasing levels of infusion of IS content into other academic areas suggests that the field is indeed becoming a reference discipline itself. The growing degree of integration between IS and other disciplines will not bring about the disappearance of IS as a separate discipline but on the contrary will strengthen it.

As was the case in 1980, the IS discipline finds itself again at a crossroad attempting to determine both objectives and direction. The highly dynamic nature of the field and the ever-changing practitioner environment are placing demands on IS academic programs to deliver programs which are both technically oriented yet managerially relevant. These demands are also mirrored in the efforts of IS academics striving to conduct and publish rigorous yet practically relevent research projects. The combination of quality education and instruction with rigorous research will help develop paradigms that guide the field and encourage integration with the expanding practitioner community. A coherent body of knowledge required for rigorous research will augment basic classroom knowledge. The mission and responsibility of business schools is to educate future business leaders and to improve business efficiency and effectiveness. IS is perfectly situated to make vital contributions toward those objectives.

Appendix A: List of Respondents by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>Argentina</td>
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Appendix B: Content Analysis Procedure

Content analysis is a family of systematic procedures for studying the content of written documents, which involves coding words or other units of text against a particular schema of interest to reduce the text to more structured or concise units of information so that inferences can be drawn. The basis of content analysis is that many words of text are classified into fewer content categories; words, phrases, sentences, or other units of text classified in the same category are presumed to share similar themes and are used to make inferences from the text. The analysis in this study followed the general principals put forth by Krippendorff (1980) but was conducted using the UNIX-based program, WORDS.

The use of the WORDS program allowed the researchers to cull information from the open-ended data without the threat of researcher imposed bias while processing was faster and more reliable than human content analysis. The unit of analysis was the response to each open-ended question, either a sentence or group of phrases. Each response was entered into the WORDS program following the procedures outlined by Sharp (1990). Program defaults were set to focus on proper expressions ignoring words such as and, or, and the. Initially, the data set representing responses of each open-ended question was split into two parts. The first part of the data set was run using the text frequency operation. This procedure provided a report of all words included in the analyzed text. The results of this text frequency was an empirically derived list. The key word list and the original responses were then input into the text variable analysis operation. The text variable analysis software generated statistics (percentages of words, sentences, and lines which address the themes of interest) indicating the extent which the themes (key words) were expressed in the analyzed text. The results of the text variable analysis was an empirically derived interpretation of the responses to each open-ended question which also confirmed the results of the researcher refined text frequency list. This interpretation provided the researchers with an unbiased and unobtrusive empirical method to report the themes present in the responses. This procedure still retained the qualitative richness of the complete response which the researchers utilized to augment the empirically derived conclusions.

Endnotes

1 AACSB is a non-profit corporation comprised of member organizations and institutions devoted to the promotion and continuous improvement of higher education for business administration and management. Their accreditation standards focus on guiding and achieving quality educational activities. Specific IS courses are not required in their curricula for undergraduate and master’s of business programs, but coverage of international business and technology issues is required in curricular elements.

2 A small number (approximately 30) of international business school deans participated in completing the survey with international IS department heads. The number of deans participating was determined by the cover letters submitted with the returned questionnaire. In no instance were separate questionnaires submitted by the department head and the business school dean. This result, although statistically insignificant, should be reassuring to the members of our community.

3 The following examples are provided to clarify the distinctions among “awareness,” “understanding,” and “expertise.” A student can be made cognizant (aware) of information system material. Alternatively, a student can be taught to comprehend (understand) the IS material. Or, a student can be taught the necessary skills (expertise) to become functionally literate in an IS environment.

4 Courses infused with IS content are courses that contain some IS material but are not entirely focused on IS issues. An example of a general IS course would be a survey or introductory course which concentrates only in the IS area.

5 The problems associated with internships include, but are not limited to (1) university resources required to support the program, (2) time required by faculty and students to maintain the internship program as well as the increase in time to complete the course of study by the student, (3) finding and maintaining ties with a sufficient number of organizations to place students, and (4) problems associated with maturity levels of students included in the internship program.

6 A determinant in the Best College and Graduate School rankings annually produced by U.S. New & World Report and Success Magazine.
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