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Ralph Westfall

California Polytechnic University Pomona, westfalr@acm.org

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AN IS RESEARCH RELEVANCE MANIFESTO

Ralph D. Westfall
College of Business Administration
California Polytechnic University, Pomona
westfalr@acm.org

OPINION

AN IS RESEARCH RELEVANCE MANIFESTO¹

Ralph D. Westfall
College of Business Administration
California Polytechnic University, Pomona
westfalr@acm.org

ABSTRACT

Many practitioners believe academic IS research is not relevant. I argue that our research, and the underlying rewards system that drives it, needs to respond to these concerns. We need to be more relevant to meet the increasing needs of our students, the organizations that hire them, and the larger society. To analyze the issues, I develop three different scenarios of where the IS field could be 10 years from now. The following visions of the future identify the implications of different levels of adaptation to relevance-related environmental pressures.

Scenario 1: Minimal Adaptation. The IS field is shrinking, largely due to competition from newly established schools of information technology. The traditional paper-based journals continue to dominate. Their slow publication cycles, in contrast to the rapid rate of change in the IT industries, mean that most technical topics and many current managerial issues are excluded from the research that generates the greatest institutional rewards. However a market analysis indicates that we can still do relevant research in categories such as: 1) issues contrary to commercial interests; 2) unsolved problems; 3) issues economically unattractive to commercial researchers; 4) issues where

¹ With apologies to James Martin for the similarity to the title of one [Martin, 1984] of his many books.

management aspects are more important than technical aspects; and 5) research on teaching IS.

Scenario 2: Moderate Adaptation. The IS field is approximately the same size, even though demand for graduates with IT skills is greater. The journals expand the subset of topics in which IS researchers can generate relevant contributions, by improving publishing cycle times. Adaptive responses include: 1) increasing electronic access to journal contents; 2) reducing review cycle times; 3) involving practitioners in reviews; and 4) revising norms for style and tone.

Scenario 3: High Adaptation. The IS field is larger than before, growing in proportion to the demand for graduates with IT skills. Academia is facing tremendous pressures, many of which are driven or influenced by IT developments. These developments enable changes in the IS field such as: 1) including technical competence in evaluation criteria; 2) rewarding publishing in practitioner-oriented outlets; and 3) involving practitioners in substantive IS program issues.

Scenario 1 is the “do nothing” alternative. Scenarios 2 and 3 represent substantial improvements, but they will not occur unless we act vigorously to improve our position.

Keywords: relevance, rigor, IS research, IS practitioners, technical skills, publishing outlets, professional evaluation, IS education

I. INTRODUCTION

How relevant should IS research be to practitioners? This question is becoming a “hot button issue.” A number of prominent IS academics [including Robey and Markus, 1998; Senn, 1998; and Mandviwalla and Gray, 1998] expressed their opinions on the subject in a special issue of *Information Resources Management Journal* in early 1998. Five papers on the same topic appeared in the March 1999 issue of *MIS Quarterly* [Applegate and King, 1999; Benbasat and Zmud, 1999; Davenport and Markus, 1999; Lee, 1999b; Lyytinen, 1999].

Joseph Williams [1999] posted a comment on the ISWorld list server in April 1999, regarding the irony of a two-year cycle time for a proposed theme issue of *MIS Quarterly* on “Redefining the Organizational Roles of Information Technology in the Information Age.” The post led to a flurry of responses, largely supportive of Williams’ position, including one from Blake Ives [1999] subtitled “The Emperor Has No Clothes.”

One way to analyze the issue is to use scenario planning, a tool that can help identify and analyze environmental pressures and their implications. The analyst develops scenarios that “describe how the major economic, social, political, and technological driving forces might plausibly combine to shape the future” [Schwartz, 1992, p. 5]. Section II of the paper offers three visions, based on the current situation and visible trends, of possible alternative futures for the IS field in the next ten years. Each scenario includes a discussion of the underlying assumptions and their implications, and outlines strategies for maximizing relevance under the constraints of that scenario.

Section III provides a discussion of previous research and commentary on the issue of relevance in IS research, referring to some of the *Information Resources Management Journal* and *MIS Quarterly* articles mentioned above. Section IV offers a market analysis of our strengths and weaknesses relative to commercial IT researchers, and identifies five areas where we enjoy an advantage or can be competitive. Section V analyzes the impacts of the proposed adaptive responses for increasing relevance under each of the scenarios.

II. SCENARIOS

SCENARIO 1: MINIMAL ADAPTATION (WORST CASE)

It is the year 2010. The IS field is noticeably smaller than just 10 years before. Some prominent universities discontinued the IS programs in their business schools, replacing them with schools of information technology [Watson *et al*, 1999]. This type of program typically upgrades a previous department of computer science to an independent school that now offers a more

multidisciplinary approach². Not all of the former IS faculty members at these universities were able to migrate into the new schools.

Some universities downgraded IS programs by consolidating them into other departments in their business schools. A few of the consolidations were into departments of accounting or operations management, but the continuing evolution of electronic commerce made marketing departments the most common destination.

The three leading IS journals--*MIS Quarterly*, *Information Systems Research*, and *Journal of Management Information Systems*--maintain their traditional role as primary outlets for high quality IS research. They retain their status because they continue to weigh most heavily in promotion and tenure decisions at research universities that still maintain identifiable IS departments.

These journals now publish their content electronically as well as in hard copy. However it took a surprisingly long time for all of them to completely embrace the new publishing technology.

In contrast to previous trends [Ives, 1993], review cycle times no longer are increasing. However they are not improving significantly either, and frequently last two years or longer. Because of the time it takes to formulate and conduct research, much of the content of these publications deals with issues identified at least three years earlier.

The rate of change in information technology did not slow from the frenetic pace at the end of the 20th century. If anything, cycles are even more rapid with continuing development of information and communication technologies. Microprocessors running at speeds up to 5000 megahertz support personal computing and are also embedded in an extensive range of products. Increasingly sophisticated software technologies (including Internet applications that exploit XML and its offshoots) are in widespread use.

² Examples of this form of organization include the School of Computer Science, Telecommunications and Information Systems (CTI) at DePaul University in Chicago, and the School of Information Technology at Swinburne University of Technology in Australia.

A recession occurs in the 2000-2002 period, and another later in the decade. The recessions temporarily dampen the job market for graduates with IT skills, but by the end of the decade demand is at historically high levels³.

Implications

Publishing Cycle Times. Long cycle times at leading journals continue to make it impractical for them to publish much research on technologies. By the time the material can be printed, even in electronic form, the technology is generally obsolete or trivially commonplace.

Some of the journals rationalize the situation by defining their primary focus as research on managerial issues related to IT [see Lee, 1999c]. However slow cycle times constrain even this subset of possibilities. IT generates many non-technical phenomena (e.g., managerial issues associated with the year-by-year development of the World Wide Web in the 1990s) that are transient but nevertheless quite important at the time. The value of research on such issues is largely dependent on its timeliness. Excluding short-lived managerial phenomena, as well as most technology issues, means that research on more than half of the total possibilities in the IS field is not publishable in the leading journals.

Deteriorating technical skills. The time and effort required to publish in leading journals makes it difficult for ambitious academics to develop and maintain skills related to current information technologies. Because the leading journals publish relatively little research on technologies, and their universities do not provide other incentives, many IS academics allow their technical skills and knowledge to become outdated.

The limited technical knowledge within tenured IS faculties makes it difficult for business schools to make good decisions about new IS curricula and technology investments. Many find it more effective to spend substantial sums on consultants instead of following the recommendations in the *IS'97 Model*

³ These assumptions about technology and the economy also hold for the second and third scenarios.

Curriculum [Davis *et al*, 1997, p. 3] to use their IS faculty for “technology assessment” and as a “resource about computing.” It is hard for the schools to find seasoned instructors with the skills to teach courses in newer technologies. Part-timers are available, but using them extensively leads to problems with accreditation and inconsistencies in course quality.

Negative practitioner perceptions. Organizational IS managers and IT professionals disrespect IS academics because of the obvious limitations in their knowledge of information technology and practice (Glass [1997] offers examples), and the irrelevance of much of their research. Practitioners are concerned because many graduating IS majors know little about the newer technologies. Large IT organizations shift funding away from IS departments in business schools, and toward the increasingly common schools of information technology. Students migrate into these programs as they become available, because the greater emphasis on up-to-date technologies improves their prospects in the job market.

IS academics in research universities acknowledge that cycle times at the leading journals make it difficult to receive recognition for research on current technological or short-term managerial phenomena. Some of the more technically competent leave academia for industry positions that offer more meaningful challenges and better pay. Among the remainder, the more perceptive turn their attention to intractable problems or long-term managerial issues (Section IV) that are relatively unaffected by long publishing cycles. Others try to hang on until they can retire.

Adaptive Responses

The market analysis in Section IV identifies and discusses the following five categories of relevant research where we can be at least competitive with commercial researchers. They are generally less time-sensitive than many of the phenomena in the IS field, and thus can be viable for research even under the constraint of long publishing cycles.

If Scenario 1 continues to dominate, IS researchers who wish to be relevant will need to limit themselves to a subset of research categories, such as:

- Issues contrary to commercial interests
- Unsolved problems
- Issues economically unattractive to commercial researchers
- Issues where management aspects are more important than technical aspects
- Research on teaching IS

SCENARIO 2: MODERATE ADAPTATION (ACADEMIC JOURNAL REFORMS)

It is the year 2010. Although the demand for graduates with IS skills is greater, the IS field is still about the same size as it was 10 years before. Earlier in the decade some IS programs were replaced by schools of information technology. However many business schools successfully resisted the trend by:

1. Emphasizing technical skills in hiring new IS faculty; and
2. Making commitments to training programs to upgrade the technical skills of existing faculty.

These changes allowed their universities to avoid the costs and effort of establishing independent schools.

The leading IS journals become somewhat less important. Other journals improve their status by offering shorter cycle times based on electronic publishing and streamlined review processes (following the lead of *Communications of AIS*). Some journals specialize in relatively new sub-areas (e.g., *International Journal of Electronic Commerce*) rather than trying to represent the whole IS field. The shorter cycle times of the newer journals make them more viable outlets for high quality research on issues with relatively short shelf lives. Some university tenure committees begin to look more favorably on publications in these outlets, because of the quality of the content and the stature of their editorial boards.

Increased competition from the newer journals forces improvements in cycle times at the previously dominant journals. They also capitalize on their longer publishing histories by making the content of previous issues available

online (going all the way back to Volume 1, Issue 1 of *MIS Quarterly* in 1977). One journal implements an innovative strategy to demonstrate the continuing value of its historical content. It develops a new category--research and analysis applying findings of previous papers to current managerial issues--and regularly publishes submissions in this category. Another journal implements a sophisticated natural language interface that greatly improves access, not just to keywords, but also to concepts in its previous content.

The leading journals and their new competitors make relevance to practice an important criterion in evaluating submissions. Several journals address the issue by including practitioners on their reviewing teams. The journals also encourage clarity and vigor in writing, to make the content more accessible to practitioners.

Implications

The changes in the policies of the leading journals reduce some of the problems of the IS field in the late 1990s. It is now more practical for academics to publish high quality research on technical and relatively transient managerial issues in higher status outlets. The general level of technical competence improves somewhat, because IS faculty hiring decisions give more weight to technical skills and because faculty members do more research on technical topics.

These improvements do not, however, solve all the problems in the IS field. The time requirements for publishing in the most prestigious outlets still conflict with keeping up with new technologies. Publishing in top tier outlets remains the dominant route to success in research universities.

Relations with practitioners improve somewhat, because of the increasing emphasis on technical issues and more relevant research. However many practitioners still feel that graduates of typical IS programs are not sufficiently up-to-date on new technologies.

Practitioners consider the computer trade press (usually in electronic form) as their most useful information source. However, aside from articles by a few academics (e.g., Tom Davenport in *CIO*) they seldom see material from IS

faculty members in these outlets. (Some practitioners also see academic contributions in publications such as *Information Systems Management*, which are targeted toward an audience of both academics and practitioners.)

Adaptive Responses

The transition to the higher level of relevance in Scenario 2 will require changes such as the following at the dominant academic journals:

- Increase electronic access to journal contents
- Reduce review cycle times
- Involve practitioners in reviews
- Revise norms for style and tone (Section V)

SCENARIO 3: HIGH ADAPTATION (CHANGES AT THE UNIVERSITY LEVEL)

It is the year 2010. The IS field grew at the same rate as demand for graduates with IT skills, and thus is larger than ever before. Some of the independent schools of information technology that were established earlier in the decade divested their IS components back into the business schools. Many IS programs that formerly operated as part of accounting or other business departments established their own identities. Even though some IS departments include faculty who teach management science, operations management, etc., most of these departments now reflect a strong IS focus.

Scenario 3 assumes that the universities respond constructively to a wide variety of environmental threats and opportunities, rather than denying their existence until a crisis develops. The pressures include:

- *Enrollment.* The “echo baby boom,” also described as “Tidal Wave 2,” increases the number of students. An increasing proportion of these students major in business, especially in IS programs.
- *Infrastructure costs.* The continuing rapid development of IT and other technologies requires large ongoing investments in both technology and personnel to meet the demands of the marketplace as well as to accommodate higher enrollments.

- *Reduced public funding* [Beardsley, 1997]. The need for external funding makes it important to tailor IS programs (and others with large IT requirements) to industry needs. Relevance is much more important for research, because the majority of projects are for private sponsors.
- *Slower tuition growth*. The trend of tuition rising faster than inflation approaches an ultimate limit. Slower revenue growth forces universities to reevaluate traditional ways of doing business, and to make changes where the old ways are not cost effective.
- *Nontraditional competitors*. The University of Phoenix, DeVry Institute and other “for-profits” continue to nibble at the lower part of the education market. “Corporate universities” provide vocational training for their own employees, including academic content taught by moonlighting university faculty. A few of the corporates offer programs for external customers, e.g., Motorola University [1998]. The IT capabilities at some of these nontraditional competitors are better than at many conventional universities.
- *Remote competitors*. The “brand identities” of many of the top 50 US universities (*US News & World Report* [1998]) are recognized throughout the world. Many of these universities capitalize on their renown by offering a much larger proportion of courses, including complete degree programs, via distance learning.
- *Continuing education*. The increasing complexity of the organizational world requires both managers and technologists to keep learning throughout their careers. Although continuing education represents an attractive marginal funding possibility, the competition from nontraditional competitors and “name school” distance learning programs is intense.

The universities recognize the implications of technology for specific programs. They realize that it is no longer effective, in terms of the mission of programs with a strong IT component, to make publication in traditional journals the dominant criterion for retention, tenure and promotion. The universities

therefore establish alternate career tracks for full-time IS faculty, analogous to the distinct “career ladders” in industry for employees who want to focus either on technology or management [Brooks, 1975]. (Under pressure from the more proactive leading universities, the AACSB accrediting body revises its standards to accommodate the changes.) Faculty career tracks typically divide along the following lines:

- **Research track.** These faculty continue to focus on research, and publish most often in traditional journals and conference proceedings. They are evaluated primarily on publications in leading refereed journals, but publication in practitioner-oriented outlets is encouraged.
- **Technology track.** These faculty emphasize relevance to industry and teaching the latest technologies. They are evaluated on the basis of:
 - *Up-to-date technical proficiency* - indicated in some cases by current technical certifications, such as Microsoft’s MCSE and Sun’s certifications for Java programmers, developers and architects.
 - *Teaching skills* - traditional student evaluations are supplemented by objective measures, where available, such as student pass rates on certification exams.
 - *Feedback from industry* - some of the consulting they do is subject to nondisclosure agreements and thus not publishable. However letters of recommendation from industry are a positive factor in reviews.
 - *Publishing in outlets that reach broad audiences* is both encouraged and rewarded. In addition, they sometimes co-author journal articles with the research faculty, in a synergistic relationship that brings together up-to-date technical skills and sophisticated research capabilities.

Note that technology track faculty differ from teaching track faculty (“clinical professors”) who have higher teaching loads, lower pay, and little or no research requirements. Heavy teaching loads conflict with the goal of

encouraging “tech track” faculty to acquire skills with a succession of emerging technologies. A possible rationalization is offering released time for development of courses in new technologies. These development activities could also lead to writing textbooks on new technologies, and presenting tutorials at IS conferences.

Implications

These changes in the rewards system, along with the changes in the leading journals from Scenario 2, make it possible for IS programs and faculty to be much more responsive to the needs of their constituents. Although the general population still doesn’t understand the distinctions between IS programs and computer science, practitioners recognize the value added through teaching organizational and management skills along with technical skills.

Practitioners are happier because IS programs are producing graduates with up-to-date technology skills as well as organizational skills. They are favorably impressed with the technical competence of technical track IS academics with whom they interact. They are also aware, through material in trade publications and by word of mouth, of specific instances where IS research helped organizations cope with new technologies and current management issues. Practitioners show their appreciation by putting more resources into IS programs and research.

Graduates are pleased that their up-to-date skills are so much in demand. They recommend the IS programs at their universities to other people, and join and contribute to the alumni association at above average rates. They utilize the university for some of their continuing education needs later in their careers.

Faculty in other disciplines complain about the changes, claiming that they damage the integrity of the university. However some grudgingly admit that their own students benefit from the additional IT resources that the revised IS programs draw to their schools. A few even acknowledge that research track IS faculty do produce high quality theoretical research.

Adaptive Responses

A transition to Scenario 3, the highest level of relevance, will require changes such as the following in the universities:

- Include technical competence in faculty evaluation criteria (Appendix)
- Encourage and reward publishing in practitioner-oriented outlets
- Involve practitioners in substantive IS program issues

III. PREVIOUS RESEARCH AND COMMENTARY ON RELEVANCE

The relevance issue generated a lot of attention in the latter part of the 1990s, but the concerns are not new to our field. One earlier analysis of relevance [Grover and Sabherwal, 1989] compared two research streams:

1. The importance of specific issues to IS executives, and
2. The frequency of publications on the same topics in leading IS research outlets

The study found “a disconcerting gap between what the IS executives consider as important and what is actually researched.” [p. 243] For example, some issues that were becomingly increasingly important to practitioners (e.g., aligning the IS organization) were receiving decreasing publication coverage in the time frame of the study. Other issues (e.g., decision support systems) continued to receive considerable research despite declining interest.

Zmud [1996] reports a commitment at *MIS Quarterly* to publish research that is simultaneously rigorous and relevant. He distinguishes this approach from a “differentiated strategy” where some articles emphasize rigor and others relevance.

Two Research Commentaries in the December 1996 issue of *Information Systems Research* are pertinent to relevance. Benbasat and Weber [1996] suggest that too much diversity in IS research could create problems. Robey’s [1996] response indicates that diversity is beneficial, if handled responsibly. Although relevance is not his primary focus, he argues for diversity because it increases relevance. Robey implicitly recognizes the validity of external frames of

reference for research, stating: “Our constituents in the business world and our students have not demanded paradigm unification.” [p. 405]

Saunders [1998] guest-edited the *Information Resources Management Journal* Winter 1998 issue on “The Role of Business in IT Research.” Her introductory remarks include a summary, selected on the basis of relevance to practitioner-oriented IT research, of the AACSB [1996] Faculty Leadership Task Force recommendations for business schools. Other pieces in the issue include:

- Robey and Markus [1998] argue that academic rigor is not incompatible with relevance, and offer four strategies for producing research that meets both criteria. They recommend:
 1. Pursuing practitioner sponsorship
 2. Employing alternative models for research e.g., evaluation research, policy research
 3. Producing research that is “consumable” in terms of style, story line, etc.
 4. Utilizing non-traditional publication outlets, e.g., *Sloan Management Review*, the business and technology press, and edited books
- Senn [1998] emphasizes the seriousness of the problem. Academic journals do not provide the timely information that is critically important to senior IT practitioners. He concurs that research can be both rigorous and relevant, but suggests that “If a tradeoff must be made, the practice-oriented researcher should most often favor relevancy.” [p. 25] Concurring with Robey and Markus, he recommends publishing in outlets other than academic journals, and also suggests academic incentives for relevant publishing.
- Mandviwalla and Gray [1998] indicate that previous IS research on GSS was relevant in some respects, and not relevant in others. They offer eight suggestions for increasing the relevance of GSS research.

In the March 1999 issue of *MIS Quarterly*, Benbasat and Zmud [1999] argue for the importance of relevant research and define its characteristics. They identify reasons why IS research often is not relevant, and provide nine

recommendations for increasing relevance. The issue also includes four commentaries on their paper. In the following sections I refer to a number of points from these papers.

IV. MARKET ANALYSIS

As an applied field, IS requires financial support and external validation from practitioners. And we received tremendous amounts of it in the past. For example, IBM provided \$26 million in the mid-1980s--grants of \$2 million to 13 universities--to improve their IS programs.

Academic and industry affiliations of names inside the front cover of early editions of *MIS Quarterly* suggest relatively more industry involvement in its formative years. For example, the March 1978 issue [Volume 2] had two consulting editors and an associate editor who came from industry, within a relatively small list of editorial positions.

Unfortunately many practitioners now feel that IS research is largely irrelevant, for example:

- The Society of Information Management International (SIM), whose membership is primarily CIOs, decided in 1995 to stop bundling *MIS Quarterly* with membership. Few members opted to continue their subscription even at a discounted price, and non-academic subscriptions declined more than 60 percent. Note that the decline occurred even though *MISQ* consciously positioned itself as a publication for both academics and practitioners, and made efforts to improve the accessibility of the content to practitioners [Senn, 1998; Benbasat and Zmud, 1999].
- Senn [1998] asserts that “a great deal of the academic research conducted in information systems is not valued by IT practitioners,” and supports his statement with eight specific indicators [pp. 23-24]. He also quotes the following “flame” from an interview with a CIO: “The work is not relevant, readable, or reachable.” [p. 23]

Is it wise for us to be unresponsive to the needs and concerns of the information technology industries, and of their customers? Not to mention gratitude for past favors, the IT industries are large and growing rapidly, and affect society on almost every level. Keene's [1980] paper for the first ICIS conference stated that "since computers are important and knowledge of how to use them limited, academics have been given a line of credit to draw on." We should be very aware of who is extending the line of credit, and quite concerned about the possibility that they (not just industry, but the larger society and the students it sends us) might decide to transfer it to other educational providers.

MARKETS FOR RESEARCH

Some material in the papers cited above indicate that we are attempting to enter (actually reenter) a new market, with an industrial rather than academic audience. For example, Benbasat and Zmud [1999] explicitly identify industry consumers for relevant research. To be effective in the new endeavor, we should do a market analysis: Who are our new competitors, and what are our strengths and weaknesses compared to their strengths and weaknesses?

Response Time

Slow response in both research and publishing is a major weakness. Research is a part-time activity, except for a few faculty who supervise sizable contingents of doctoral students. Academic journal editors and reviewers also work on a part-time basis. In the context of the rapid pace of change of IT, a part-time approach represents a serious limitation on the types of problems we can address.

Heavy demands on our time contribute to the delays. Academics do more than research; they teach and perform service for their institutions. In the IS field we also need to be familiar with some of the numerous reference disciplines that are useful in studying the intersection of technology and organizational practices.

The resources of the Forresters and Gartners of the IT world, and the R & D units of major hardware and software companies, appear virtually unlimited in comparison to ours. They can complete and circulate their studies

faster than we can do a preliminary design. For example, in March 1994 Brancheau *et al.* [1996] mailed the first round of a Delphi study on IS management key issues. They reported their findings in the June 1996 issue of *MIS Quarterly*. In contrast, the turnaround time of Computer Sciences Corporation's Critical Issues [CSC, 1997] survey is approximately six months from fielding the survey to publication.

Response time considerations. To provide context on the timing issue, consider personal computer systems as a rough indicator of the pace of change in information technology in the same interval as the Brancheau *et al* [1996] study. Dell's most expensive desktop computer on the back cover of the March 15, 1994 issue of *PC Magazine* ran at 60 MHz, had 16 MB of RAM, a 1 GB hard drive, a 2x CD-ROM drive, and listed at \$4,699. In the June 11, 1996 issue, Dell offered a high-end system for \$3,599 that ran at 200 MHz, with 32 MB of EDO RAM, a 2.5 GB hard drive, and an 8x CD-ROM drive⁴.

The concept of an "Internet year" provides another perspective on the rate of change in our field. The Internet, especially the World Wide Web, develops so rapidly that an interval of several months appears comparable to a full year in other areas of the economy.

These comparisons are not in any way intended to disparage the notable contributions of Brancheau and co-authors of the study cited above to the development of the IS field, or the diligence of the editors and reviewers at *MIS Quarterly*. On the other hand, they do suggest major limitations on the types of relevant research we can do. And these limitations are even more constricting if the most important outlets for our findings are journals that operate under the traditional academic publishing model.

Because of their resources, we generally cannot compete with commercial IT market research firms, and captive IT research units, on topics they actively research. On the other hand, they must generate income in excess of expenses

⁴ To truly appreciate the rate of change, view these previous specifications in the context of the back cover of the most recent issue of *PC Magazine*.

and maintain long-term relationships with their clients. These factors limit the topics on which they work.

Technical Competence

Another weakness is inconsistent levels of technical competence. Some IS academics possess extensive and up-to-date technology skills, and devote the necessary time to maintain them. Others' skills are limited or outdated.

Comparative Advantages of Academia

All is not lost, however. Consider the following characteristics of academia, and their implications:

- *Academic freedom.* We can study whatever we wish.
- *Societal perspective.* In particular, we can study issues with little or no prospect of immediate payoffs, including ones where the benefits are social rather than economic. We serve the larger society, rather than specific economic interests, and publicize our findings rather than trying to conceal them. This “disinterested posture” [Robey and Markus, 1998] adds institutional credibility to our efforts.
- *Intellectual environment.* Colleagues in other disciplines, graduate students, and exposure to cutting-edge research provide intellectual stimulation and give us a broad perspective.
- *Highly skilled assistants.* Our graduate students are bright and motivated, often with strong technology skills and significant industry experience, and always with new ideas.
- *Long-term perspective.* We can seriously consider working on problems that may not be solved for 20 years, or in our lifetime.

FIVE CATEGORIES OF ADVANTAGE OR COMPETITIVE PARITY

Based on our relative strengths and weaknesses and the constraints of publishing in traditional academic journals, I identify five categories of topics that still offer opportunities for us to be relevant to our external constituencies. Some

of the following categories may not be at all practical for Gartner *et al* to address. In the others, our unique characteristics should make us competitive.

1. Issues Contrary to Specific Commercial Interests

The IT industries produce a wide range of goods and services. They therefore provide many opportunities for IS academics to do research of interest to practitioners on many aspects of their products. Our status as an objective third party, without a financial interest in the outcomes, makes our research even more relevant. This type of study corresponds to “evaluation research, which is strongly established in professional schools of education, social work, and public health.” [Robey and Markus, 1998, p. 10; Davenport and Markus, 1999]

Benbasat and Zmud [1999] suggest that IT research will be more relevant if practitioners can use it to justify IT initiatives and actions. We may be able to provide an even more valuable service to industry and society, by doing research that may expose problems and thus “unjustify” certain technologies or practices that generate substantial revenues for vendors and consultants. Business firms are unlikely to hire commercial market research firms to study problems that are not generally known to their customers. If commercial firms do find such problems in the course of other studies, the results will not see the light of day except when solutions are developed and the problems can be identified in competitive advertising. Allen Lee, editor of *MIS Quarterly*, also hints at such a role, although in a somewhat different context: “I believe that ... one of our responsibilities as academicians is to be the conscience for our practitioner colleagues and, indeed, for society in general.” [Lee, 1999b, p. 31]

Examples of issues contrary to commercial interests. In contrast to the next category (unsolved problems), for this kind of issue we must be relatively nimble. However our field can point to the following examples of timely research:

- *Outsourcing.* Lacity and Hirschheim's article [1993a] and book [1993b] debunked a lot of hype before problems with outsourcing became widely known. Their publications are a classic example of the “theory-based, context-rich ... research” recommended by Benbasat and Zmud [1999], providing numerous usable recommendations for practitioners.

- *Panko's research stream on spreadsheet errors.* The most spectacular example of a spreadsheet error was a missing minus sign on a \$1.2 billion entry, which led to an extremely inaccurate estimate in a letter to Magellan Fund shareholders [Savitz, 1994]. Most spreadsheet problems will never receive such public exposure. However Panko [1998] looked at 22 studies using various research methodologies and reports "Every study that has attempted to measure errors...has found them at rates that would be unacceptable in any organization."
- *End-user computing problems.* Edberg and Bowman's [1996] study compared database systems development by MBAs versus undergraduate CIS majors (surrogates for EUC developers and IS professionals, respectively). Contrary to conventional wisdom about EUC, as promoted (largely implicitly) by hardware and software companies, the systems developed by the CIS majors were more functional and had far fewer errors than the ones developed by the MBAs representing EUC development.
- *Strategic information systems/data planning.* Goodhue *et al* [1992] demonstrated that firms were committing extensive resources to strategic planning, but receiving limited benefits. Lederer and Sethi's [1988] study was more timely, but the numerous long tables reduce its readability for practitioners.

Research contrary to commercial interests might appear to conflict with my suggestion that we must be responsive to the concerns of the IT industries. On the macro level, there is no contradiction. Lacity and Hirschheim's [1993b] research, although somewhat unfavorable to outsourcers, represents valuable information for the much larger category of organizations that consider outsourcing. Although the leading spreadsheet vendors are quite large, they are small in comparison to the sum total of all the businesses and employees that use spreadsheets.

The commercial world recognizes our institutional credibility and that our duty is to the larger society. It is not in a position to criticize competently

executed research. Specific organizations may withhold funding and cooperation for research counter to their interests, but their losses usually represent gains to other potential sponsors.

2. Seemingly Unsolvable Problems

These problems present potentially large economic or societal impacts but, despite extensive research over long periods, remain unsolved. Commercial firms lose interest because of the complexity and low probability of a near-term payoff. They may continue to work sporadically on them, but generally do not come up with any real breakthroughs.

In contrast, academics remain interested because of the challenge of the problems, and because the economic and social possibilities offer a hope of glory if we can make substantial progress. Academia recognizes the value of a good effort on a complex problem and does provide rewards (i.e. publications) even if the research does not produce solutions. Since the problems remain unsolved for many years, it generally does not matter that we work slowly on them.

Examples of unsolved problems. The following items are a sample of the possibilities in this category:

- *Expert systems (and many other areas of AI).* The potential benefits and societal impacts are quite large, but usage remains low in spite of over 30 years of research.
- *Electronic meeting systems (and other GSS).* Numerous studies indicate significant improvements over conventional meetings, but EMS usage is not common. (For an analysis of discrepancies between findings from laboratory and field research, see Dennis *et al.* [1991].)
- *Systems development failures.* This problem is long-standing. For example, NATO commissioned a conference thirty years ago to address the “software crisis” [Gibbs, 1994].
- *Telecommuting.* Substantial individual, organizational, and societal benefits are potentially available, but daily usage remains low in spite of over 20 years of research and increasingly favorable technologies [Westfall, 1997].

Rigor. These types of problems also represent appropriate targets for the sophisticated theories, tools, and techniques associated with academic rigor. Many practitioners do not recognize the value of our seemingly esoteric approaches. If high levels of rigor are truly worthwhile, what better way to prove it than to make progress on unsolved problems that are economically or socially important? This would be far better than applying such sophistication to problems that are trivial, or where the results appear “intuitively obvious” [Kavan, 1998, p. 20].

Implicitly one of the rationales for using complex tools or techniques on small problems is to pilot their use. Reviewers should reject this rationale except in situations where there is an opportunity to “beat our competitors (journals in other fields) to market” with the initial demonstration of the value of the approach. Otherwise they should require that researchers apply such approaches to worthy problems. Similarly, consistent with editorial decisions at *MIS Quarterly* in the mid-1990s, reviewers should reject research whose “primary objective is to achieve, through the application of sophisticated methods, yet another minor improvement in some instrument that has already undergone multiple tests” [Benbasat and Weber, 1996, p. 392].

Hitt and Brynjolfsson [1996] use econometric statistical analyses to address the long-standing IT “productivity paradox.” Although their methodologies may be inaccessible to many practitioners, the issue certainly qualifies as a major problem.

Cumulative research. Research with a long-term perspective will not be relevant to most practitioners in its initial stages. However an accumulation of small advances may make it possible to eventually solve some major unsolved problems. The situation is similar to the example of drilling for oil that decision theorists [e.g., Raiffa 1968] often use. If the ultimate payoffs are large enough, a few successes can justify many failures and other efforts that represent minimal progress.

Cumulative research led to many significant discoveries in the physical and biological sciences. Developing a cumulative research tradition is a long-

standing concern in the IS field [e.g., Keene 1980]. However cumulative research is a means to an end, not an end in itself. Solving some difficult problems through cumulative efforts would be a practical way to demonstrate to external stakeholders the value of academic research that does not initially appear relevant to them.

3. Issues Not Economically Attractive to Commercial Researchers

As academics our research is on a part-time basis, but we can access graduate students on favorable terms. This leads to the following types of opportunities:

- Projects too small for consulting firms. Davenport [1997] suggests projects under \$100,000.
- Institutional sponsorship projects requiring substantial amounts of skilled assistance. The WorkSmart project [PonTell *et al*, 1996] on virtual offices included a sizable contingent of graduate students (myself included). However the cost to each of the five clients was only \$25,000 because of the student workers and additional funding from Federal and state sources.

As an example of this kind of research, CIGNA Corp. sponsored studies at the Comparison and Evaluation Laboratory at Temple University. Student teams did in-depth evaluations as part of a course or for independent study credit, under the guidance of a faculty advisor [Mandviwalla, 1998]. The University of California, Irvine established an industry-university cooperative research center with funding from the National Science Foundation to cover some of the costs [CRITO, 1998].

For small, longer-horizon projects with uncertain outcomes, organizations may be willing to invest modest sums. We can offer access to the cutting-edge concepts that might be necessary to achieve a break-through. Even if we do not generate a significant advance in knowledge, the cost will be lower than doing it commercially. Organizations also recognize that sponsorship can help them recruit top-quality graduates regardless of the research outcomes.

4. Issues Where Management Predominates, Rather Than Technology

To examine this category, we first need to consider different ways of defining the IS field. One way of conceptualizing IS is that it occupies the intersection of management and technology issues. Another way to view the field is to focus on the management aspects and put technology issues in a subordinate role.

IS'97 definition. The IS'97 model undergraduate curriculum states that IS “encompasses two broad areas: (1) acquisition, deployment, and management of IT resources and services ... and (2) development and evolution of technology infrastructures and systems” [Davis et al, 1997, p. 1]. The report also notes that, although IS is distinct from computer science, “they both require a common subset of technical knowledge.” [p. 7] The ten-course model curriculum includes the following five IT courses:

- IS'97.4: Information Technology Hardware and Software
- IS'97.5: Programming, Data, File and Object Structures
- IS'97.6: Networks and Telecommunications
- IS'97.8: Physical Design and Implementation with a DBMS
- IS'97.9: Physical Design and Implementation with a Programming Environment

The IS'97 definition implies that a sizable proportion of IS faculty understand the underlying technologies. It is also consistent with the range of research topics at IS conferences. For example, the Americas Conference [AIS 1998] included a number of fairly technical presentations within program tracks such as artificial intelligence applications, object-oriented software development, technology research, and technology research in progress.

Management emphasis definition. The table below is a graphic illustration of another definition. In this diagram, an information system “consists of not just the technology ... or the social setting ... but also of the rich phenomena that emerge from the interactions.” [Lee, 1999a, p. v] The technologies are in the primary domain of science and engineering, while social settings are studied extensively by social scientists in business schools and other disciplines. Based

on this definition the greatest opportunities for the IS field to provide added value is to study the emergent interactions between the technologies and the social setting.

SOCIAL SETTING		TECHNOLOGY
<ul style="list-style-type: none"> • People • Procedures 	→ Emergent interactions ←	<ul style="list-style-type: none"> • Hardware • Software • Networks • Data

Source: Based on Lee [1999a, p. vi].

At first glance, Lee’s definition suggests that our position is half way between the computer scientists and the social scientists. However in practice, his perspective puts us closer to the social sciences and more distant from the technologies that are driving most of the phenomena in the middle. Studying emergent interactions is best done with the research approaches and perspectives of social scientists, not of computer scientists or software engineers.

Problems with management emphasis definition. Lee’s definition suggests that we can view technology as a “black box” and therefore need only be concerned with inputs and outputs, rather than any underlying mechanisms. It glosses over the different levels of complexity in information technologies, and the different types of users. The right column of the table aggregates items as diverse as personal productivity software, second- through fourth-generation programming languages, and networking hardware and software into a single category. In this approach, the technical issues in the rightmost table entries are peripheral to the main concerns of the IS field.

Without a substantial component of technological competence, where is the added value that differentiates the IS field from the management field in business schools? Lee’s perspective does not address issues implied by the common complaint that ‘Information technology is managed by people who don’t understand it, and understood by people who don’t manage it.’ It downplays important issues in end user computing (EUC), in which a considerable

proportion of the organizational value derives from users' technical skills. It does not correlate with the IS'97 Model Curriculum [Davis *et al*, 1997] or typical IS programs, which include courses in systems analysis and database concepts and provide practical implementation experience with specific technologies. It does not explain the increasing importance of "techno-MBA" programs [Dyer *et al*, 1998] in leading universities.

Rate of change. Lee's formulation shown in the table does not consider the rate of change that differentiates IS from other fields that deal with social settings. Changes are driven by growth in technological capabilities (e.g., Moore's [1965] Law), and by competitive exploitation of the increasing capabilities. The rate of change is such that, in many cases, IS academics will not be able to publish results in leading research journals if the nature or duration of the emergent interactions are dependent on the technological aspects.

To illustrate the problems of rapid technological change even on studies concerned with emergent interactions, consider the hypothetical example of a 1995 research study on how people develop strategies for using Gopher to find information on the Internet. After completing their data collection, analysis and writing, the authors submit their paper to a leading journal in 1996. The study could be ready for publication in 1998, after going through several typical cycles of reviews and revisions. However the tremendous growth in the World Wide Web in the three-year period, and the emergence of search engines as a major tools for finding information, make the findings so irrelevant by 1998 that they are unpublishable.

Although he states that "*MIS Quarterly* is an information systems journal, not a technology journal" [Lee, 1999c], Lee's definition does not necessarily apply to all the leading IS journals. Izak Benbasat [1999], the incoming editor, indicates that "*Information Systems Research (ISR)* publishes research papers associated with IS/IT broadly defined, and intends to bring ... 'different specialties in OB, database, telecomm, programming, strategy, and the like, ... under one roof'."

Category of relevant research. Regardless of whether Lee's definition is appropriate or harmfully restrictive, it does identify an area where we can make a contribution. Research on management issues related to specific technologies can still be valuable even if the technical aspects are not critically important. If the findings can be generalized to the management of subsequent technologies, it may not matter that the underlying technologies were superseded.

However we not alone in the management area. Consulting firms are quite diligent in identifying "best practices" to help clients deal with the complexities of dealing with IT. We need to demonstrate to the organizational world that our theory-based findings can be more effective than the simpler prescriptions of the consultants.

Case studies. The primary users of this kind of management oriented research are IS academics who seek good material for their students for written assignments and classroom discussions. Thus case studies represent an example of generating research that is relevant to "today's student--tomorrow's practitioner" [Davenport and Markus, 1999, p. 22]. From a research perspective, another positive aspect of case studies is the potential for generalizing their findings to theories [Yin, 1989] about the management of technology.

The IS publishing scene was blessed in the late 1990s with three new outlets for case studies:

- An annual volume of case studies--*Annals of Cases on Information Technology Applications and Management in Organizations* [Khosrowpour, 1999]
- *Journal of IT Cases and Applications* [Palvia, 1998]
- *Communications of AIS*, which publishes "topics including tutorials, methodologies, cases, teaching notes, professional issues, and literature surveys." [Gray, 1999a]

5. Research on Teaching IS

One of our major strengths is that we supply graduates with skills in the rapidly growing IS field. Academics in other areas cannot deny the increasing student demand for our courses, and our success in placing graduates in good

positions. However we ourselves may not really understand the implications of the explosive growth in IT. Davenport [1997, p. 38] indicates that “Most students are trained for the past, not the present (and certainly not the future).”

Rapid growth makes IS fundamentally different. Most other fields do not need to prepare their students to deal with content that is displaced or devalued by newer technologies within five years of graduation. Creativity is a related issue, because the new technologies offer tremendous opportunities to the individuals and organizations that can successfully exploit the inherent possibilities. We therefore should conduct research on how best to prepare our students, and the organizations that hire them, to cope with the challenges of growth [Westfall 1998, Couger 1996].

One argument by both Westfall and Couger is that, in addition to information on current technologies, we should teach “meta-skills.” Our students need to learn how to evaluate new technologies, and how to learn them on a self-service basis, so that they will be able to keep themselves up-to-date after they finish their formal education. They also need to learn to be innovative in applying these new technologies to organizational problems and opportunities.

The reason for the existence of our field is to help organizations and individuals use information technology more effectively to achieve their goals. We therefore should model this behavior by striving to be among the academic leaders in research in the following developing areas:

- Distance learning
- Technology in education
- Virtual organizations and remote work
- Knowledge management

There are other academic fields, especially education, that retain strong interests in some of the areas listed above. However given our charter, we definitely should be involved in research on using technology to teach our material more effectively.

Many of our students will be exposed to virtual teams and distance learning in the organizations that hire them. Who should be better than we to

provide students with an initial exposure and practical experience with these technologies? We can point to some IS research and analysis in these areas [e.g., Jarvenpaa *et al.*1998; Ives and Jarvenpaa, 1996]. However our relatively limited activity led Ives [1998] to lament: “We are late to the party. And it’s our party.”

Note that we enjoy a tremendous advantage over commercial researchers on these topics. Our efforts to continuously improve our teaching provide many opportunities to test technologies and related procedures in classroom settings.

V. ANALYSIS OF IMPACTS OF ADAPTIVE RESPONSES

This section discusses the impacts of the adaptive responses I outlined under the three scenarios in Section II. Tables 1 through 3 below summarize these responses and provide an analytical framework for evaluating their impacts on our primary stakeholders: students, practitioners, and our academic peers. I provide my personal evaluations of the impacts, but readers can adapt the analysis by substituting their own evaluations.

DISCUSSION OF SCENARIO 1 IMPACTS

Under this scenario, IS researchers focus on topics where we hold a relative advantage over commercial researchers, or can be at least competitive. As with many other broadly defined research programs, this kind of research can impact stakeholders within and outside the university community both positively and negatively, as shown in Table 1.

Table 1. Impacts of Adaptive Responses Under Scenario 1

Adaptive Responses	Impact on Relevance to Students	Impact on Relevance to Practitioners	Impact on Stature within Academic Community
Focus on Relative Strengths (applicable to all 3 scenarios)			
1. Issues contrary to commercial interests	slightly positive	more positive than negative	positive
2. Unsolved problems	somewhat negative	somewhat negative in short run, but positive in long term (if we can solve significant problems)	positive
3. Issues economically unattractive to commercial researchers	strongly positive	positive	positive
4. Issues where management aspects are more important than technical aspects	positive and negative	positive and negative	negative
5. Research on teaching IS	strongly positive	strongly positive	positive and negative

Issues Contrary to Commercial Interests

For practitioners, the impact will be mixed. Exposing problems with commercial products and services will not please their suppliers. However unbiased analyses will benefit the larger category of purchasers. The impact on our students will be small but positive, if the findings translate into teaching on effective approaches to evaluating and managing IT products and services.

This type of research is consistent with the well-established tradition of social criticism in academia, and thus should enhance our stature within the community. Research in this area can also counterbalance perceptions of a “pro-industry” tilt among the other adaptive responses.

Unsolved Problems

By definition, these are problems that resisted previous efforts, and the research is not likely to generate immediate results. Therefore research on this category will not appear relevant to students or practitioners. However if we eventually succeed developing solutions for some difficult problems with high payoffs, practitioners will be more likely to recognize the value. These

practitioners will include former students, who graduated long before the research yielded usable results.

These types of problems are ideal targets for theory based, methodologically rigorous, cumulative research. As such, academics in other areas will recognize the value of well-executed research on these problems.

Issues Economically Unattractive to Commercial Researchers

The impacts should be positive for all stakeholders. The external funding provides resources, research opportunities, and experience for graduate students. Some of the resources will spill over to other departments, in the form of multidisciplinary research or as hardware and software available to others. The external sponsors access sophisticated research capabilities at below-market rates, and also gain exposure to desirable employment candidates.

Issues Where Management Aspects Are More Important than Technology

The impacts for this kind of research are mixed. The further we move away from technology, the more we infringe on the turf of other academic departments such as management, marketing, and library science. Practitioners with a technical focus, undergraduate IS majors, and “techno-MBA” students will also question activities that appear to divert attention away from their strong interests in technology.

On the other hand, our association with technology could enable us to generate relevant knowledge faster or better than academics in other areas. If our findings are useful in dealing with fast-moving but critically important managerial issues (e.g., many aspects of electronic commerce), practitioners and students will quickly recognize the validity of IS research on IT management issues.

Research on Teaching IS

This kind of research should generate strongly positive impacts on both students and practitioners. To the extent the findings improve IS teaching, such research can help alleviate the well-publicized shortfall of IT workers in the US

economy [US Department of Commerce, 1998], and lead to increased opportunities and better pay for our students.

In terms of relationships with other academics, the results will be mixed. On the one hand, research on teaching invades the turf of other departments. On the other hand, our experience with the technologies and contacts with IT suppliers are valuable for multidisciplinary projects, and can attract resources usable elsewhere in the university.

DISCUSSION OF SCENARIO 2 IMPACTS

Under this scenario, the leading IS journals reengineer their policies and procedures, to make the dissemination of IS research findings more consistent with the phenomena we study. Table 2 shows that the impacts on practitioners and students are uniformly positive, while the impacts on our peers in academe are mixed.

Table 2. Impacts of Adaptive Responses Under Scenario 2

Adaptive Responses	Impact on Relevance to Students	Impact on Relevance to Practitioners	Impact on Stature within Academic Community
Reengineer IS Publishing (also applicable to 3rd scenario)			
1. Increase electronic access to journal contents	positive	positive	mostly positive
2. Reduce review cycle times	strongly positive	strongly positive	depends on magnitude of reduction
3. Involve practitioners in reviews	positive	positive	negative
4. Revise norms for style and tone	strongly positive	strongly positive	mixed

Increase Electronic Access to Journal Contents

The impacts on stakeholders will be predominantly positive, if the journals move quickly. (Delays in making current and historical content permanently available in electronic form will reflect negatively on perceptions of our technical competence and our own understanding of the subjects we teach.) Students and practitioners recognize the tremendous benefits of electronic access and believe that all the information they want should be available online. Academics in most

other fields are also under pressure to meet expectations of students and faculty for electronic access, so progress in this direction will not violate any norms⁵.

One possible negative concern is whether publications in completely electronic outlets will be viewed positively for tenure and promotion decisions. Arguably we should provide strong incentives for publishing in all-electronic outlets, because it is so consistent with our subject matter. On the other hand, our colleagues in other fields may disagree with high evaluations of publications in outlets with short publishing histories.

Reduce Review Cycle Times

The primary impact of faster cycles is to make it more practical for us to do research on technical issues, and on managerial issues that are important even though their life spans are relatively short. These issues are quite relevant to practitioners and students, so the secondary impact on these stakeholders should be strongly positive.

Moderate improvements in cycle times (e.g., from 30 months to 24 months) could be accomplished without major changes, and thus the impact on the opinions of our academic peers should be minimal. Large improvements would require substantial changes, however, which could negatively impact their attitudes.

As an example of the possibilities, *Communications of AIS* offers authors the option of full peer review or review by an associate editor. The editor [Gray, 1999b] reports that, utilizing the latter procedure, one 75-page paper [Alter, 1999] was issued electronically 28 days after it was received.

Involve Practitioners in Reviews

Although not appropriate for all types of research, practitioner reviews will generally increase relevance to practitioners and students. Assuming that the practitioners are sufficiently distanced from the academic environment, they will

⁵ Note that this adaptive strategy could include making materials electronically available prior to publication. See King's [1999] report on how *Information Systems Research* experimented with prepublication of a research commentary by Whitman *et al* [1999].

be in a much better position to evaluate both relevance and readability. Our peers in other areas may be skeptical, but their grounds for opposition will be weak if IS academics handle the majority of the work on each review process that includes practitioner inputs.

Revise Norms for Style and Tone

The style and tone of a paper are a relatively small issue, seemingly much less important than its content. Nevertheless Benbasat and Zmud [1999] indicate they strongly influence a practitioner's decision to read a paper or not. Robey and Markus [1998, p. 8] are even more emphatic, noting that "From a practitioner's perspective, academic writings are literally unreadable."

In mid-1998, I found that the submission guidelines on the *MIS Quarterly* web site said I should "Avoid the use of the first person." Checking again in 1999, I found that the guidelines now stated: "Writing in the first person is acceptable, especially for qualitative, interpretive, intensive, critical, and case research." [MISQ, 1999] Supported by prominent manuals of writing style [e.g., Strunk and White, 1979], I suggest proceeding to the logical conclusion. The guidelines for journals in the IS field should not just tolerate a more direct and forceful writing style for some types of research, they should require it for all types of research. An "academic" style of writing, with extensive use the passive voice, is counterproductive. Such a style does not in any way contribute to the rigor of the contents; it just reduces accessibility to practitioners.

The adaptive response of using outside reviewers will improve readability. The adaptive response of rewarding publication in practitioner-oriented outlets (see below) could also help, because these outlets put greater emphasis on readability. Writing for such outlets will provide practice in generating more accessible content.

The impact of improving readability for practitioners will, of course, depend on the content. If the findings are not relevant, readability is a non-issue. However if the content is relevant, poor readability may prevent transferring information that could be quite helpful. If the practitioner does read it anyway, the

difficulties will negatively impact his or her attitudes toward academics. The effects on students will be similar.

Our academic peers suffer through a great deal of bad writing in their own disciplines, so many will appreciate better writing. Some of the more traditional still feel that all research should be published in academesese.

DISCUSSION OF SCENARIO 3 IMPACTS

This vision of the future is the most optimistic. Scenario 1 indicates a passive acceptance of existing constraints by focusing on research topics that could still be relevant within its limitations. Scenario 2 reflects changes in the publishing process to reduce the impacts of those constraints and expand the subset of relevant topics. Scenario 3 contemplates radical changes in the underlying incentive system that is ultimately responsible for the irrelevance of much of our research.

Institutional Considerations

Many of the tenure and promotion issues are not within our control as a field; they are decided at the level of the school in which the IS department is housed, or at higher levels in the larger university [King and Applegate, 1997]. However, as discussed in Section II, the universities will be facing tremendous pressures in the next 10 years that should make them more receptive to considering major changes from their traditional ways.

My call for substantial changes in the structure of academia is not unprecedented. The *AACSB Faculty Leadership Task Force Report* [AACSB, 1996] identifies gaps between faculty skill levels and business practices. The report includes a strategy--Improve Faculty Skill Levels--that specifically recommends changes in the tenure criteria and reward processes for business school faculty. It suggests that "quality faculty members who work hard at building linkages with industry will receive higher annual [salary] increases, more favorable promotion and tenure treatment..."

Table 3 indicates a divergence in the projected impacts. Students and practitioners will respond positively, but our academic peers will react negatively.

Table 3. Impacts of Adaptive Responses Under Scenario 3

Adaptive Responses	Impact on Relevance to Students	Impact on Relevance to Practitioners	Impact on Stature within Academic Community
Lobby for Changes in Academia			
1. Include technical competence in evaluation criteria	strongly positive	strongly positive	strongly negative
2. Reward publishing in practitioner-oriented outlets	positive	positive	negative
3. Involve practitioners in substantive IS program issues	strongly positive	positive	negative

Include Technical Competence in Evaluation Criteria

Technology is central to our field and is having a tremendous impact on society throughout the world. I therefore argue that increasing academic rewards for demonstrable technical competence is the adaptive strategy that will generate the largest positive effect on our relevance to students and practitioners. However keeping up with technology requires a great deal of time and effort, which currently is not rewarded by incentive systems at most universities (Appendix).

On the other hand, directly rewarding technical competence is a radical departure from long-standing traditions in the university. The reaction from some of our peers in other disciplines will therefore be quite hostile. They may accuse us of being “technicians,” even though much of the instructional content in other graduate professional schools (e.g., medicine and law) is at a technical level.

This adaptive response raises another bugaboo: many academics are finding it stressful to keep up with technologies related to the mechanics rather than the content of their teaching [HERI, 1999]. Rewarding increased technical competency for IS faculty suggests incentives or expectations for increased IT competence among faculty in unrelated disciplines.

Reward Publishing in Practitioner-Oriented Outlets

As academics we occupy a privileged position, with the opportunity to substitute research for teaching. This privilege implies a responsibility to share our research findings with the larger society in the most effective fashion.

Practitioner-oriented publications offer opportunities to fulfill our obligation in ways that are not possible with academic journals. They have larger circulation, and their emphasis on readability and interest make their content much more accessible to their readers.

Based on their editorial policies, articles accepted by practitioner-focused publications will be relevant and readable. Increased publishing in this kind of outlet will therefore affect practitioner and student attitudes positively. Such publishing will also generate more exposure for IS academics, leading to better public relations and greater access to external resources.

Rewarding publications in nonacademic outlets conflicts with highly institutionalized traditions related to tenure and promotion, so the impact will be negative in the academic community. However the criticism could be reduced if publishing in practitioner-oriented outlets stimulates increased external funding for IT resources for use throughout the university.

Involve Practitioners in Substantive IS Program Issues

Increasing involvement with industry is an obvious adaptive response for increasing relevance. It suggests many obvious benefits to the university, including:

- Increased access to resources including software, hardware, and training
- Greater research relevance through better understanding of practitioner concerns [Benbasat and Zmud, 1999]
- More and better employment opportunities for students

As long as the relationship is relatively one-sided, i.e. industry's main role is supplying resources, increased involvement is not controversial. However it is unrealistic to expect outsiders to provide substantial inputs and yet exercise little influence on the use of these resources.

I argue that it is in the best interests of the IS field to allow practitioners to substantively influence IS program decisions, for the following reasons:

- The monetary issue: this strategy will generate more resources than a one-sided relationship.

- The technology issue: the more sophisticated practitioners possess a better understanding of future IT trends. In contrast to IS academics, they work on a full-time basis with rapidly changing technologies and have access to proprietary market research. In some cases their companies are actively involved in shaping the future directions.

The most obvious type of increased involvement is sponsored courses that teach specific vendors' software (e.g., Oracle), or teach software that coalitions of vendors sponsor (e.g., Java, Linux). Success with such intimate relationships will require a sophisticated understanding of technology management issues. However our expertise in this area should help us avoid the potential pitfalls in such relationships.

As an example of substantive industry involvement, consider the possibility of using industry inputs in tenure decisions. This would shift the rewards system toward increased relevance and greater technical competence. Table 4 shows a summary of responses to an ISWorld query asking for examples of inputs from practitioners.

Table 4. Examples of Practitioner Inputs into Tenure Decisions

<p>Example 1: Dean blocked respondent's tenure decision. Several practitioners subsequently provided inputs to President, Provost, and Associate Provost, and they overruled the Dean (which was previously "unheard of" at this university).</p> <p>Example 2: One person submitted letters from practitioners in an industry association and copies of reports authored with that group. This was evidence of "scholarship of practice," which is one of the four types of scholarship considered in tenure decisions at that university.</p> <p>Example 3 (respondent is at a "top 5" IS school): Respondent knew of "at least 2 universities" that solicited letters of recommendation from senior practitioners (corporate or government positions) for people being evaluated for hiring, promotion, or tenure.</p>

Source: Condensed from Westfall [1999].

Impacts. For students, substantive industry involvement is strongly positive. It offers opportunities to learn more advanced software technologies, leading to better employment opportunities upon graduation and possible part-time work or internships while in school. The impact on practitioners will be

positive, if sufficient faculty members develop the necessary technical skills to teach the sponsored technologies.

The response of academics in other areas will be increasingly hostile as industry involvement becomes more substantive. However increased access to resources for the whole university could allay some of the criticism.

VI. CONCLUSIONS

The issue of relevance is ultimately linked to our identity. Suppose that the IS field is much like other fields. Then the type of research we do, the evaluation standards, and the rewards system should be comparable to those in other fields. However if there are many prominent differences between the IS field and other fields, then our research, our standards, and our incentives should be different. We need to understand who we are.

As a “thought experiment” to explore our identity, consider the following. Neuroscientists find that subjects exhibit a negative brain wave peaking at around 400 milliseconds after exposure to a word in a sentence that is semantically inconsistent with the preceding words. The magnitude of this “N400” wave is larger when the semantic incongruity is larger [Kutas and Hillyard, 1980]. In this context, read the following statements:

1. A truly great university needs an outstanding department of ... philosophy. (This statement will probably not stimulate an N400 response.)
2. Every university needs a department of ... history. (This second statement may elicit a moderate N400 response. It is unquestionably true, but the very possibility of a university without a history department is a bit incongruous.)

Now replace the words “philosophy” and “history” with “information systems.” Repeat each of the modified statements out loud, to heighten the effect. Do they strike you as more than a little incongruous? Repeat the statements out loud in the presence of academics from other fields, if you dare, and estimate the N400 responses from their facial expressions.

IS is not one of the cultural foundations of world civilization, or even western civilization. People do not come to us to discover the meaning of life or the nature of being. Students come to us because we can provide skills that will help them get good jobs, pay off their student loans, and make meaningful contributions to the organizations that hire them. Industry is happy to hire all the competent graduates we can turn out, and wishes we could supply more. If we can generate research that helps IS professionals do their work more effectively, so much the better.

INTELLECTUAL STATURE

I am not saying that our field lacks intellectual respectability. As evidenced by the continuing high failure rates over many years, successfully developing and implementing large computer systems (at the extreme, the US air traffic control system [Gibbs, 1994]) is an extremely complex and challenging activity. Arguably, “Computer programs are mankind’s most elaborate artifacts.” [Shore, 1985, p. 209] Any assistance we can provide in reducing the failure rate, and associated impacts, will be a noteworthy contribution to human progress⁶.

When people go through adolescence, they often doubt their self-worth. They compare themselves to others and emphasize their own shortcomings. They fail to recognize their strengths, and question the value of their unique abilities. This behavior is normal in adolescence, albeit painful, and can be beneficial if it helps individuals develop their own identities. On the other hand, it is sad to see--and possibly pathological--in a person past the age of 30. Our field possesses an established research tradition that Alavi *et al.* [1989] trace back to 1968. It is therefore time for us to exorcise the specters that are haunting us, and leave adolescent *angst* behind. We are who we are. Our research, and the evaluation policies that drive it, should unashamedly reflect our place in the world.

⁶ In this regard, Leon Kappelman’s [e.g. Kappelman and Gregory, 1999] diligent efforts on the Y2K problem are certainly a credit to our community.

WINDOW OF OPPORTUNITY

Change is inevitable. The dynamism of the current environment represents a window of opportunity for us to influence the transformations that are undoubtedly coming.

First, we can proactively take action in areas that are under our control. The leading journals need to speed up cycle times and improve accessibility to their content. In other words, they need to operate in a mode that is consistent with the phenomena that we study. These actions will make the journals more viable outlets for research on technologies, and for research on managerial issues that are heavily influenced by the underlying technologies.

Second, we need to influence the outcome of issues that are decided by others. The extensive pressures facing the universities, in context of the revolutionary and all-encompassing societal changes driven by information technology, present a unique opportunity to communicate with decision-makers. But to act effectively, we need to recognize who we are and unhesitantly lobby for academic reforms that reflect the realities of our identity.

Or we can waste our time and energy in futile efforts to defend the *status quo* and hold back the onrushing tide of technology-driven changes. The window of opportunity will soon be past. Will we seize the moment, or will we yield our place to others?

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REFERENCES

AACSB (1996) *AACSB Faculty Leadership Task Force Report*, The International Association for Management Education, <http://www.aacsb.edu/ffintro.html> (current September 3, 1999).

AIS (1998) *1998 Americas Conference: Conference Proceedings*, Baltimore, MD: Association for Information Systems, <http://www.isworld.org/ais.ac.98/proceedings/home.html> (current September 3, 1999).

Alavi, M., P. Carlson and G. Brooks (1989) "The Ecology of MIS Research: A Twenty Year Status Review," *Proceedings of the Tenth Annual Conference on Information Systems*, Boston: International Conference on Information Systems.

Alter, S. (1999) "A General, Yet Useful Theory of Information Systems," *Communications of AIS* (1)13, <http://cais.isworld.org/articles/1-13/article.htm> (current September 3, 1999).

Applegate, L. M. and J. L. King (1999) "Rigor and Relevance: Careers on the Line," *MIS Quarterly* (23)1, pp. 17-18.

Beardsley, T. (1997) "In Focus: Science's Survival Strategy," *Scientific American* (277)2 (August), pp. 13-16.

Benbasat, I. (1999) "Capstone Journals," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added May 20), <http://www.commerce.uq.edu.au/isworld/announce/msg.20-05-1999-8.html> (current September 3, 1999).

Benbasat, I. and R. Weber (1996) "Research Commentary: Rethinking Diversity in Information Systems Research," *Information Systems Research* (7)4, pp. 389-399.

Benbasat, I. and R. Zmud (1999) "Empirical Research in Information Systems: The Practice of Relevance," *MIS Quarterly* (23)1, pp. 3-16.

Brancheau, J. C., B. D. Janz, and J. C. Wetherbe (1996) "Key Issues in Information Systems Management: 1994-95 SIM Delphi Results," *MIS Quarterly* (20)2, pp. 225-242.

Brooks, F. P., Jr. (1975) *The Mythical Man-Month: Essays on Software Engineering*, Reading, MA: Addison-Wesley Publishing Company.

Couger, J. D. (1996) "Creativity: Important Addition to National Joint Undergraduate I.S. Curriculum," *Journal of Computer Information Systems* (37)1, pp. 39-41.

CRITO (1998) "The National Science Foundation Designates CRITO One of Six Industry-University Information Technology Research Centers in the Nation," *CRITO Newsletter* (7)1, p. 1, <http://www.crito.uci.edu/newsletters/html/fall98.html> (current September 3, 1999).

CSC (1997) *Critical Issues of Information Systems Management*, El Segundo, CA: Computer Sciences Corporation.

Davenport, T. (1997) "Storming the Ivory Tower," *CIO* (10)13 (April 15), pp. 38-41, http://www.cio.com/archive/041597_think_content.html (current September 3, 1999).

Davenport, T. H. and M. L. Markus (1999) "Rigor vs. Relevance Revisited: Response to Benbasat and Zmud," *MIS Quarterly* (23)1, pp. 19-23.

Davis, G. B., J. T. Gorgone, J. D. Couger, D. L. Feinstein, and H. E. Longenecker (1997) *IS'97: Model Curriculum and Guidelines for Undergraduate Degree Program in Information Systems*. Park Ridge, IL: Association of Information Technology Professionals, <http://webfoot.csom.umn.edu/faculty/gdavis/curcomre.pdf> (current September 3, 1999).

Dennis, A. R., J. F. Nunamaker, Jr., and D. Vogel (1991) "Comparison of Laboratory and Field Research in the Study of Electronic Meeting Systems," *Journal of Management Information Systems* (7)2, pp. 107-135.

Dyer, J., L. Lasdon, and T. Ruefli (1998) "The Techno-MBA," *OR/MS Today* (25)1, pp. 32-36, <http://lionhrtpub.com/orms/orms-2-98/techno.html> (current September 3, 1999).

Edberg, D. T. and B. J. Bowman (1996) "User-Developed Applications: An Empirical Study of Application Quality and Developer Productivity," *Journal of Management Information Systems* (13)1, pp. 167-185.

Gibbs, W. W. (1994) "Software's Chronic Crisis," *Scientific American* (271)3 (September), pp. 86-95.

Glass, R. L. (1997) "Practical Programmer: Revisiting the Industry/Academe Communication Chasm," *Communications of the ACM* (40)6, pp. 11-13.

Goodhue, D. L., L. J. Kirsch, J. A. Quillard, and M. Wybo (1992) "Strategic Data Planning: Lessons from the Field," *MIS Quarterly* (16)1, pp. 11-34.

Gray, P. (1999a) "Communications of the Association for Information Systems," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added January 8), <http://www.commerce.uq.edu.au/isworld/announce/msg.15-01-1999-2.html> (current September 3, 1999).

Gray, P. (1999b) "Publishing, Reviewing, and Related Issues," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added May 15), <http://www.commerce.uq.edu.au/isworld/announce/msg.15-05-1999-1.html> (current September 3, 1999).

Grover, V. and R. Sabherwal (1989) "An Analysis of Research in Information Systems from the IS Executive's Perspective," *Information and Management* (16)5, pp. 233-46.

HERI (1999) "An Overview of the 1998-99 Faculty Norms," Higher Education Research Institute, University of California, Los Angeles, http://www.gseis.ucla.edu/heri/Faculty_Overview.html (current September 3, 1999).

Hitt, L. M. and E. Brynjolfsson (1996) "Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value," *MIS Quarterly* (20)2, pp. 121-142.

Ives, B. (1993) "Editor's Comments: Cycle-Time Reduction for Disseminating Scholarly Research," *MIS Quarterly* (17)2, pp. xxi-xxiii.

Ives, B. (1998) "Conclusions," *The Information Systems Shuttle: A Proposal for Collaborative Learning and Research*, ISWorld Net Virtual Meeting Center, <http://ww2.cis.temple.edu/isworld/vmc/April98/ives/sld009.htm> (current September 3, 1999).

Ives, B. (1999) "Response to Joseph Williams' Essay: The Emperor Has No Clothes," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added April 22), <http://www.commerce.uq.edu.au/isworld/announce/msg.22-04-1999-14.html> (current September 3, 1999).

Ives, B. and S. L. Jarvenpaa (1996) "Will the Internet Revolutionize Business Education and Research?" *Sloan Management Review* (37)3, pp. 33-41.

Jarvenpaa, S., K. Knoll, and D. Leidner (1998) "Is anybody Out There? Antecedents of Trust in Global Virtual Teams," *Journal of Management Information Systems* (14)4, pp. 29-64.

Kappelman, L. and C. Gregory (1999) *Y2K Endgame Strategies: Risk Management, Testing, and Contingency Planning*, Chicago: Society for Information Management (SIM) International.

Kavan, C. B. (1998) "Profit through Knowledge: The Application of Academic Research to Information Technology Organizations," *Information Resources Management Journal* (11)1, pp. 17-22.

Keene, P. G. W. (1980) "MIS Research: Reference Disciplines and Cumulative Traditions," in E. R. McLean (ed.) *Proceedings of the First International Conference on Information Systems*, Philadelphia: International Conference on Information Systems, pp. 9-18.

Khosrowpour, M. (ed.) (1999) *Annals of Cases on Information Technology Applications and Management in Organizations* (Vol. 1), Hershey, PA: Idea Group Publishing.

King, J. L. (1999) "Editorial Notes," *Information Systems Research* (10)2.

King, J. L. and L. M. Applegate (1997) "Crisis in the Case Study Crisis: Marginal Diminishing Returns to Scale in the Quantitative-Qualitative Research Debate," in A. S. Lee, J. Liebenau and J. DeGross (eds.) *Information Systems and Qualitative Research*, London: Chapman & Hall, pp. 28-30, <http://www.hbs.edu/applegate/cases/research/paper.html> (current September 3, 1999).

Kutas, M. and S. A. Hillyard (1980) "Reading Senseless Sentences: Brain Potentials Reflect Semantic Incongruity," *Science* (207)4427 (January 11), pp. 203-205.

Lacity, M. C. and R. Hirschheim (1993a) *Information Systems Outsourcing: Myths, Metaphors and Realities*, New York: John Wiley & Sons, Inc.

Lacity, M. C. and R. Hirschheim (1993b) "The Information Systems Outsourcing Bandwagon," *Sloan Management Review* (35)1, pp. 73-86.

Lederer, A. L. and V. Sethi (1988) "The Implementation of Strategic Information Systems Planning Methodologies," *MIS Quarterly* (12)1, pp. 445-461.

Lee, A. S. (1991) "Integrating Positivist and Interpretive Approaches to Organizational Research," *Organization Science*, (2)4, pp. 342-365.

Lee, A. S. (1999a) "Inaugural Editor's Comments," *MIS Quarterly* (23)1, pp. v-xi.

Lee, A. S. (1999b) "Rigor and Relevance in Information Systems Research: Beyond the Approach of Positivism Alone," *MIS Quarterly* (23)1, pp. 29-34.

Lee, A. S. (1999c) "The Timeliness of Publications in MIS Quarterly," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added May 6), <http://www.commerce.uq.edu.au/isworld/announce/msg.06-05-1999-1.html> (current September 3, 1999).

Lyytinen, K. (1999) "Empirical Research on Information Systems: On the Relevance of Practice in Thinking of IS Research," *MIS Quarterly* (23)1, pp. 25-28.

Mandviwalla, M. (1998) "Internet Development," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added June 2), http://www.commerce.uq.edu.au/isworld/announce/int_dev.html (current September 3, 1999).

Mandviwalla, M. and P. Gray (1998) "Is IS Research on GSS Relevant?" *Information Resources Management Journal* (11)1, pp. 29-37.

Martin, J. (1984) *An Information Systems Manifesto*, Englewood Cliffs, NJ: Prentice-Hall, Inc.

MISQ (1999) "MISQ Archivist: Information for Prospective Authors," <http://www.misq.org/roadmap/standards.html> (current September 3, 1999).

Moore, G. E. (1965) "Cramming More Components on Integrated Circuits," *Electronics* (38)8 (April 19), pp. 114-117.

Motorola University (1998) "Motorola University: Learning Services: Training Open to You," <http://www.mot.com/MU/LS/index.html> (current September 3, 1999).

Palvia, S. (1998) "JITCA--Journal of IT Cases and Applications," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added June 7), <http://www.commerce.uq.edu.au/isworld/announce/msg.06-07-1998-5.html> (current September 3, 1999).

Panko, R. R. (1998) "What We Know About Spreadsheet Errors," *Working Paper*, Honolulu: College of Business Administration, University of Hawaii, <http://www.cba.hawaii.edu/panko/papers/ss/whatknow.htm> (current September 3, 1999).

PonTell, S., P. Gray, M. L. Markus, and R. D. Westfall (1996) "The Demand for Telecommuting," in R. T. Watson and R. P. Bostrom (eds.) *Proceedings of the Telecommuting '96 Conference*, Jacksonville, FL: The Barnett Institute of the University of North Florida, <http://www.terry.uga.edu/mis/TC96/papers/gray.pdf> (current September 3, 1999).

Raiffa, H. (1968) *Decision Analysis: Introductory Lectures on Choices Under Uncertainty*, New York: McGraw-Hill, Inc.

Robey, D. (1996) "Research Commentary: Diversity in Information Systems Research: Threat, Promise, and Responsibility," *Information Systems Research* (7)4, pp. 400-408.

Robey, D. and M. L. Markus (1998) "Beyond Rigor and Relevance: Producing Consumable Research about Information Systems," *Information Resources Management Journal* (11)1, pp. 7-15.

Saunders, C. (1998) "Editorial Preface: The Role of Business in IT Research," *Information Resources Management Journal* (1):1, pp. 4-6.

Savitz, E.J. (1994) "Magellan Loses its Compass," *Barron's* (84)50 (December 12), p. 35.

Senn, J. (1998) "The Challenge of Relating IS Research to Practice," *Information Resources Management Journal* (11)1, pp. 23-28.

Schwartz, P. (1992) "Composing a Plot for Your Scenario," *Planning Review* (20)3, pp. 4-8, 46.

Shore, J. (1985) *The Sacher torte Algorithm and Other Antidotes to Computer Anxiety*, New York: Viking.

Strunk, W. and E. B. White (1979) *Elements of Style* (3rd ed.), New York: Allyn & Bacon.

US Department of Commerce (1998) *America's New Deficit: The Shortage of Information Technology Workers*, Washington, DC: US Department of Commerce, Office of Technology Policy <http://www.ta.doc.gov/Reports/itsw/itsw.pdf> (current September 3, 1999).

US News & World Report (1999) "National Universities: Top 50," U.S. News & World Report, Inc. http://www.usnews.com/usnews/edu/college/rankings/natunivs/natu_a2.htm (current September 3, 1999).

Watson, H., K. P. Taylor, G. Higgins, C. Kadlec, and M. Meeks (1999) "Leaders Assess the Current State of the Academic IS Discipline," *Communications of AIS* (2)2, <http://cais.isworld.org/articles/2-2/> (current September 3, 1999).

Westfall, R. D. (1997) *Remote Work: The Demand for Telecommuting*, unpublished doctoral dissertation. Claremont, CA: Claremont Graduate School (abstract at http://www.cyberg8t.com/westfalr/dis_abst.html , current September 3, 1999).

Westfall, R. D. (1998) "Evaluation and Assimilation Skills As Key Knowledge Aspects Of Information Technology Literacy," Irvine, CA: National Research Council, Computer Science and Telecommunications Board, *Workshop on What Everyone Should Know about Information Technology* http://www.cyberg8t.com/westfalr/it_litrc.htm (current September 3, 1999).

Westfall, R. D. (1999) "Practitioner Involvement in Tenure Processes," in R. Weber (ed.) *Archive of Research Information Solicited via ISWorld*, (added

December 21, 1998), <http://www.commerce.uq.edu.au/isworld/research/msg.21-12-1998-3.html> (current September 3, 1999).

Whitman, M. E., A. R. Hendrickson, and A. M. Townsend (1999) "Academic Rewards for Teaching, Research, and Service: Data and Discourse," *Information Systems Research* (10)2, pp. 99-109, <http://pubsonline.informs.org/> (available September 3, 1999 through guest login and subsequent links).

Williams, J. (1999) "MISQ Themed Issue," in R. Weber (ed.) *ISWorld Net, Community Announcements*, (added April 22), <http://www.commerce.uq.edu.au/isworld/announce/msg.22-04-1999-2.html> (current September 3, 1999).

Yin, R. K. (1989) *Case Study Research: Design and Methods*, Newbury Park, CA: Sage Publications, Inc.

Zmud, R. W. (1996) "Editor's Comments," *MIS Quarterly* (20)3, pp. xxxvii-xl.

APPENDIX

TECHNOLOGY AND THE IS ACADEMIC

As mentioned in Section IV, we may not fully recognize the implications for teaching of the explosive growth in information technology. I also question whether we understand the implications for how we evaluate faculty.

Like faculty in other departments in a research university, we do teaching and service, we do research and publish, and we need to keep up with the scholarship in our field [Whitman *et al*, 1999]. Keeping up with the scholarship is complicated by the multitude of reference disciplines. Other fields work with reference disciplines, e.g., psychology enjoys a long-standing and productive involvement with mathematical statistics. However I suspect that few fields are involved with as many reference disciplines as we are.

In addition, we must cope with the unique characteristics of IT. Much more than academics in other fields, we must (or should) keep up with the rapid pace of technological development⁷.

COUNTERPRODUCTIVE REWARDS SYSTEM

Recognizing the importance of technology, a faculty member may invest time and effort to keep up with a set of existing and new technologies on a continuing basis. Everything else being equal, this person will not be able to publish as much research--which meets the standards of our reference disciplines--as a faculty member who does not keep up with technology. Which faculty member will possess more credibility with industry? Which one will be more likely to produce research that practitioners can really use? Which one will be better able to prepare students to meet the challenges they will face in their careers? But which one will receive the greater rewards in the current academic spoils system?

The present situation “leads to opportunistic research behaviors that tend to ignore practice.” [Lyytinen, 1999, pp. 25-26] One consequence of this opportunism is that many researchers are limited in their understanding of technical issues, which leads to a lack of respect from IS professionals.

CAREER LADDERS

When industry faced a similar issue, it responded by developing separate “career ladders” for technical employees [Brooks, 1975]. Some employees aspire to the excitement and challenge of management. Those with technical interests advance by enhancing their skills while remaining on the technical side.

Scenario 3 in Section II introduces the concept of technical track for IS faculty, where maintaining and enhancing technology skills is an important factor in evaluation and advancement. This approach will give us an opportunity to enhance our stature among external constituents, by “practicing what we preach” about the importance of continuing education to practitioners. It will also provide

⁷ This is possible on a representative basis, with different IS faculty keeping up with different technologies.

knowledge and skills that will be useful for research on the application of technology to IS education.

CERTIFICATIONS

The increasing prominence of certification programs (Novell's CNE and Microsoft's MCSE are well publicized, but there are many others) provides a convenient vehicle for assessing technical competence when evaluating faculty members. Although the examinations generally do not involve a lot of higher level thinking, they do require a considerable amount of knowledge of the topic. Their popularity in the employment marketplace demonstrates that many practitioners view them as an indicator of technical competence.

Because of the rapid rate of growth and change in IT, certifications are a transient indicator. To use them for evaluations, institutions would need to recognize that their value depreciates. A faculty member with a certification would need to maintain its value by passing exams on later versions of the technology, or by replacing it with a certification in a newer technology.

Up-to-date certifications can increase our credibility with our external constituencies. Those who acquire them can expect opportunities to teach certification courses, typically at the undergraduate level. They will also be able to provide up-to-date and relevant information to students in other courses. The certifications are widely accepted and well-respected in industry, and therefore provide additional opportunities to enhance our reputation among practitioners.

NEED FOR INCENTIVES

Exhortations to increase technical skills will not benefit our field unless we provide appropriate incentives. If we do not reward such efforts, we will continue to experience a "brain drain." Technically competent faculty are leaving academia for well-paying industry positions where they can do work that is more relevant to practice (AACSB [1996] identified this problem, although not in an IS context). Our constituents--in industry and especially students--are not blind to this deterioration in our collective technical competence. Lack of technical skills also limits the types of research that we can do, further compounding the relevance problem.

ABOUT THE AUTHOR

After a 26-year business career, **Ralph Westfall** earned a Ph.D. in Management of Information Systems from Claremont Graduate University in 1997. He teaches via physical presence at California Polytechnic University in Pomona and plans to teach remotely through distance learning technologies. He has published in *Information Systems Management* and *Journal of Computer Information Systems*, and wrote a chapter in *The Virtual Workplace*. He presented papers at conferences of the Association for Information Systems and Decision Sciences Institute, and was invited to participate in a 1998 National Research Council workshop on information technology literacy. His research interests include the virtual office and other forms of remote work, distance learning, information technology literacy, and applications of information technology in higher education.

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