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Research and Publication Opportunities at the Intersection of IS and Healthcare

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ABSTRACT
Many good reasons exist for conducting interdisciplinary research at the intersection of IS and healthcare. Healthcare is a large and growing industry that currently is undergoing major transformation to its information technology (IT) base. IS confronted similar transformations in other industries, and developed theories and methods that could prove useful in healthcare applications. In turn, IS should benefit from incorporating knowledge from health informatics, a discipline which studies IT within medical and healthcare contexts. Despite the benefits, it is often a struggle for interdisciplinary researchers in IS and healthcare to publish their work, especially in journals directed toward IS audiences. In this paper, we outline strategies and resources to help ease this publication bottleneck. As a part of our discussion, we introduce a new paper series on IS and Healthcare to be published by Communications of the AIS and describe a new online resource for research in IS and healthcare.

Keywords
Interdisciplinary research, reference discipline, publication strategies, health informatics.

DRIVERS FOR IS AND HEALTHCARE RESEARCH
Healthcare is a massive industry. In 2000, healthcare industries accounted for 14% of the US GDP ($1.31 trillion). By 2010 this figure is projected to rise to $2.6 trillion (Plunkett, 2003). Major forces are transforming the ways that healthcare industries apply information technology (IT). For example:

• The Health Insurance Portability and Accountability Act of 1996 (HIPAA) and similar laws and regulations are motivating development of standardized healthcare systems and increasing the attention paid to privacy and security of electronic data in healthcare.
• Financial motivations and organizational acquisitions and mergers are prompting healthcare administrators to implement large-scale IT integration projects.
• Reductions in insurance coverage are requiring people to spend more of their own money for healthcare. As a consequence, patients are gaining increased leverage in motivating healthcare providers to support technology that meets patient needs, including electronic access to health records, appointment scheduling, and health-related communication.
• Widespread availability of online health information (e-health) is creating a population of informed consumers who want their own healthcare providers to supply more resources electronically, including healthcare information, medical consultation, and instrumentation for diagnosis, monitoring, and treatment of medical conditions.

The combination of a large industry and sweeping transformation is creating unprecedented demands on IT workers in healthcare to design, implement, and manage new systems. At the same time, opportunities are opening for researchers, especially those who can supply relevant expertise from outside healthcare.

The large size of the healthcare industry has allowed it to create a distinct IT profession (we refer to this discipline as health informatics, an umbrella term used in this paper to describe medical informatics, bio-informatics, and other related health IT areas). Health informatics researchers and practitioners direct their efforts toward meeting the unique IT needs of the industry, such as hospital admissions, insurance billing, and medical imaging.

IT change has been more rapid outside healthcare than within healthcare. Only recently, for example, did healthcare organizations begin to develop e-health sites for access by their patients. For IS researchers there is opportunity to benefit healthcare by applying expertise gained in other domains to address challenges that are still new to the health informatics...
discipline. The IS discipline can benefit as well, both by testing its theories and methods in healthcare settings and through cross-pollination with health informatics expertise.

Despite the opportunities that healthcare offers, IS researchers who conduct interdisciplinary studies in this area frequently face an uphill climb to publish their work, especially in IS journals (Chiasson & Davidson, 2002). Fortunately, we believe this situation is beginning to improve, both through introduction of new publication opportunities in IS and through greater openness to interdisciplinary research by the IS and health informatics communities.

In this paper, we draw from examples of successfully-published papers to outline three strategies that can help researchers publish interdisciplinary work in IS and healthcare. We also discuss two new resources available to aid researchers in this pursuit.

STRATEGIES FOR PUBLISHING IS AND HEALTHCARE RESEARCH

Our discussion of research strategy in this section is predicated on the reference discipline which the research draws from and audience for which it is intended. Reference discipline refers to the source of theories, methods, and practices that are applied in the research. Audience refers to the intended primary and secondary consumers of research findings; in our discussion, audience will necessarily refer to readership of specific classes of scholarly journals.

We propose that reference discipline and audience are essential components of effective strategies for publishing research in interdisciplinary fields. Journal editors and referees necessarily function as gatekeepers guarding admission to the journal 1. In their gatekeeper role, one objective is to turn away manuscripts which are not based upon sound principles. Principles drawn from one’s own reference discipline are presumed to be sound, whereas others’ principles may require greater justification and could be discounted. A second objective is to turn away manuscripts that are not directed toward readers of the journal, i.e., its audience. If journal editors and reviewers are not comfortable with the reference discipline and audience orientation of a manuscript, they are unlikely to accept the work.

Figure 1 illustrates three strategies that proved successful in publishing interdisciplinary IS and healthcare research. We include three reference discipline categories:

- IS,
- health informatics, and
- a general category of shared disciplines that both IS and health informatics draw from.

Because this discussion focuses on interdisciplinary research between IS and health informatics, we do not include reference disciplines that are not applicable to both disciplines, e.g., medicine, and do not include strategies where the reference discipline and audience discipline are the same. The arrows in the illustration represent strategies for successful publication by drawing from a specific reference discipline and orienting toward a specific audience. In the following sections, we describe each strategy (designated by its numeric tag in Figure 1) and briefly recount a case in which we applied the strategy in publishing an interdisciplinary paper in an IS or health informatics journal. We illustrate this discussion with our own papers because we are familiar with how they were developed, where they were submitted for publication, and what editorial decisions resulted from their review. The papers we discuss are intended to serve as example cases of successful publication strategies, and not as exemplars of topic selection, research, or writing.

Strategy 1: Using an IS Reference to Inform a Health Informatics Audience

IS developed number of theories and methods that are applicable to other disciplines, e.g., work in resistance to IT implementation and business process reengineering techniques (Baskerville & Myers, 2002). Some areas of IS research expertise are particularly relevant to problems currently facing healthcare, e.g., security assurance in e-commerce, system integration, and end-user computing. Drawing from the IS reference discipline is a natural approach for IS researchers, who are presumably knowledgeable in these areas and capable of justifying the soundness of IS principles to reviewers outside the IS discipline. To apply this strategy effectively, it is primarily necessary to address topics that are current and relevant to health informatics audience. Such topics may be identified by reviewing recent conference proceedings and journals and extrapolating healthcare industry trends.

1 Note that this statement is not intended to diminish other roles of editors and referees, e.g., improving papers and mentoring authors.
Case Paper: Modeling Patients’ Acceptance of Provider-Delivered E-Health

In 2002, we looked at industry trends involving e-health. By that time, e-health websites had proliferated across the Internet, and many already failed in the dot-com implosion. E-health was conceived initially as a for-profit enterprise, and many early e-health websites were developed by investors with no formal ties to established healthcare organizations. We saw a trend toward e-health being developed by healthcare providers to meet needs of their own patients. Drawing from our experience as IS researchers, we predicted that getting patients to accept and use provider-delivered e-health would soon emerge as a topic of interest for the health informatics audience.

We contacted a large healthcare provider in the U.S. Midwest that was readying an e-health application for market testing and were given permission to survey individuals who registered for access. From this survey data we were able to compare the fit and predictiveness of three technology acceptance models drawn from the IS literature, and assess importance of five patient characteristics (satisfaction with medical care, health knowledge, information-seeking preference, healthcare need, and Internet dependence) as antecedents to the models. Although parts of the findings may be interesting to an IS audience, e.g., model comparisons, the entire design is interesting to health informatics professionals. They want to know whether acceptance models are applicable in the domain of healthcare, and they can envision applying the findings regarding antecedents to predict patients’ tendencies toward accepting e-health before the applications are actually implemented. A high level of reviewer interest led to a conditional acceptance of our paper (Wilson & Lankton, Forthcoming) on first review by the Journal of the American Medical Informatics Association (JAMIA), a top journal in the health informatics discipline (Rowlands, 2002). Reviewers asked primarily that we expand our explanations of model components, e.g., why we measured behavioral intention as our dependent variable instead of actual use, and our use of structural equation modeling (SEM) methods, e.g., by distinguishing among the various fit metrics.

Strategy 2: Using a Health Informatics Reference to Inform an IS Audience

Traditionally, the IS discipline is open to research that draws from reference disciplines, especially through application of theory originally developed outside IS. Theory may simply be appropriated, as in the case of social presence theory (Short, Williams, & Christie, 1976), which is taken directly from the social psychology literature and applied in studies of computer-mediated communication and group support systems. Alternatively, theory may be adapted and extended, e.g., as in the role played by the theory of reasoned action (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) in development of the technology acceptance model (Davis, 1989). Research methods and practices developed in other disciplines also are applied in IS.
research, such as the SERVQUAL instrument which was originally developed by marketing researchers (Jian, Klein, & Carr, 2002). In addition, applications and practices from outside IS can be drawn into the discipline, e.g., such as developing business software with object-oriented methodologies, a practice that originally emerged from operations research (Nygaard & Dahl, 1981).

Although this strategy is a straightforward approach to publishing interdisciplinary papers in IS journals, obstacles must be overcome for it to be effective. Health informatics is an applied discipline, so we would expect it to be more valuable to IS as a source for applications and practices than as a theory base. However, this means using health informatics as a reference discipline may require extensive justification, and the research must be undertaken with the advance knowledge that top IS journals are generally reluctant to accept atheoretical papers. Further, not all practical innovations from outside IS will capture the interest of an IS audience. Therefore, it is important to choose topics that are both current and relevant to important IS concerns.

Case Paper: Asynchronous Healthcare Communication

By 2001, Internet email was ubiquitous in the U.S. and other developed nations. It was increasingly being considered a commodity application, i.e., all vendors supplied similar functionality, and no vendor could charge premium pricing for its product. At that time, it was hard to envision that a major force toward customization of email and other forms of asynchronous computer-mediated communication (CMC) would emerge from the general marketplace. However, one of the authors observed that email had not yet proliferated in a key area of healthcare. Physicians used email to communicate with colleagues and patients used email for business and pleasure, but physicians and patients did not use email to communicate with one another. This observation prompted research into the underlying practices of the medical profession and physician-patient relationships. The research resulted in a paper calling on the IS discipline to innovate CMC through application customization to overcome physician resistance to email and meet the specialized needs of physicians, medical staff, and patients. In this case, the status of health informatics development and surrounding practices provided key inputs that could be directed toward an IS audience. The resulting paper (Wilson, 2003) was accepted by Communications of the ACM without substantive changes.

Strategy 3: Using a Shared Reference to Inform a Health Informatics Audience

Because of the openness of IS to outside reference disciplines, IS researchers often are quite familiar with theories, methods, and practices whose roots are not in IS. In many cases, these reference disciplines are shared between IS and health informatics, yet there are likely to be aspects that have not been studied within health informatics. As in Strategy 1, this gap creates potential to apply a new technique that will be interesting to health informatics audiences, assuming the technique and research findings are relevant to current issues.

Case Paper: Strategic Implications of Asynchronous Healthcare Communication

Following on the heels of the CACM paper profiled in Strategy 2, we wanted to analyze the advent of asynchronous healthcare communication (AHC) within a theoretical framework and present the strategic implications of this analysis to a managerial audience who could put our technical recommendations into effect. Ideally, we sought a combined audience of health informatics and health technology management professionals. The paper applies the theoretical framework of disruptive innovation (Christensen, 1997), originally developed in the discipline of technology and operations management, to explain how AHC may enter the very low end of the healthcare marketplace and then move upmarket through a series of sustaining innovations, e.g., feature enhancements. We then describe a set of strategic opportunities for innovating AHC and present a prototype AHC system design that incorporates some of these feature enhancements to conventional email. This manuscript was written as a chapter in a book that was withdrawn prior to publication. Subsequently, the paper (Wilson & Lankton, 2004) was submitted and accepted with minimal changes by the International Journal of Health Technology and Management, one of a growing number of peer-reviewed publications that focus on targeted areas of the health informatics discipline.

Lessons Learned

As is often the case, we find both good news and bad news in our attempts to publish interdisciplinary IS and healthcare research. The good news is that our papers in this area were received with unusual enthusiasm, and two placed in top journals within their respective disciplines. Although some luck is certainly involved, we believe the positive reception we encountered is due in large part to planning the research to draw from an appropriate reference discipline and to be interesting
to the intended audience. Although our experiences are necessarily anecdotal, the outcomes suggest there will be good news for other authors who replicate the strategies that we recommend in the prior discussion.

The bad news is two-part.

First, there is currently no recommended strategy for publishing papers in the overlap between IS and health informatics audiences shown in Figure 1. Up to this point, no journal outlet is directed toward an interdisciplinary IS and health informatics audience, although tracks with this focus now exist at several major IS conferences, including HICSS, AMCIS, and IRMA.

Second, little consensus exists across academic institutions on how at least some of these publications should be ranked for tenure and promotion consideration. In our cases, we are both IS faculty members in business schools. CACM is well-known and well-regarded in IS departments; in some it is ranked as a top-tier publication. However, JAMIA is barely known in IS, although it is a top research journal in health informatics. This seeming obscurity means it will be necessary for us to provide solid documentation that JAMIA is a “good” journal, and the possibility remains that our documentation will be discounted by tenure and promotion committees.

Fortunately, we can report that both these problems are being addressed by activities currently underway within the auspices of the Association for Information Systems (AIS). These activities include introduction of a Communications of the AIS (CAIS) paper series on IS and Healthcare and creation of an online resource center for researchers in IS and healthcare. These activities are described in the final sections of the paper.

CAIS PAPER SERIES ON IS AND HEALTHCARE

The editor of CAIS authorized an ongoing series of papers under the title “IS and Healthcare.” The series will be edited within a new department at CAIS. Submissions may take the form of research articles, tutorials, applications, cases, and other presentation forms appropriate to CAIS policy. Manuscripts should be submitted following the instructions to authors shown on the CAIS website: http://cais.isworld.org.

The primary intent of this series of papers is to provide a forum for healthcare research that is oriented toward IS audiences, which we previously discussed as strategy 2 (Figure 1). Ideal submissions will cross the boundaries between IS and health informatics disciplines. Submissions directed toward that portion of the IS audience who conduct interdisciplinary research in healthcare are particularly welcome. In this way, the paper series will not only expand current opportunities to publish health-related research in a mainstream IS journal, but will create a new venue for papers oriented toward the overlap between IS and health informatics audiences that is illustrated in Figure 1. The series will provide an outlet for papers that inform the process of conducting this type of interdisciplinary research as well as the findings of the research itself.

ONLINE RESOURCE CENTER FOR RESEARCH IN IS AND HEALTHCARE

We identified numerous independent resources for IS and health informatics research. In IS, these resources include the excellent ISWorld and AISNet websites. In the health informatics discipline, the American Medical Informatics Association website is equally useful. However, no equivalent resource was available previously to support interdisciplinary researchers. This paper introduces the Research in IS and Healthcare (Rish) website, accessible at: http://www.etl.sba.uwm.edu/Rish.

Rish is an interactive, data-driven website that allows users to contribute resources, links, and discussion as well as consume existing information. This design permits the site to grow over time with relatively light maintenance and moderating requirements. A brief list of resources on the site include:

- Journal, book, and conference calls and schedules
- Searchable bibliographies
- Funding sources and grant announcements
- Journal ranking data and references
- Collaboration opportunities
- Event calendar, including cross-listings with schedule dates and deadlines

Rish provides support for planning, funding, and justifying interdisciplinary research in IS and healthcare. Access is free but requires users to establish a login identity, i.e., name, institution, and verified email address. Although the website is quite new, we anticipate that it will quickly prove useful in supporting research in this area.
SUMMARY

Our objectives in this paper were to outline reasons why IS researchers should consider conducting interdisciplinary research in healthcare, to describe the strategies that we found effective in publishing this research, and to introduce new resources. As IS researchers, we find that healthcare offers opportunities that are hard to match in other industries. Although some people encountered difficulties publishing research in this area, our experience is that the situation is improving overall and, where obstructions exist, they often can be overcome through strategic planning. The resources we described should contribute meaningfully toward legitimizing interdisciplinary research in IS and healthcare and making it easier to accomplish.

REFERENCES