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Panel

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Abstract

The IS field was born as a new discipline of artificial science out of an intellectual chaos at the time when information and communication technologies were beginning to transform modern organizations. Our discipline is now at another pivotal moment as the scope of digital technology grows beyond the organizational realm. The expansion of the influence of digital technology in everyday life provides a critical opportunity—and challenge—to expand the intellectual boundaries of the IS research community beyond the traditional focus of organizational computing. This panel will explore the challenges and potential faced by the IS community as IS researchers seek to explore these emerging uses of information and communications technologies.

Keywords: IS field boundaries, social networking, virtual teams, virtual worlds, consumer IT

Introduction

In recent years, prominent information systems (IS) researchers (e.g., Benbasat et al. 2003) have argued that to achieve legitimacy the field of IS needs to focus on its intellectual core, bringing into question the appropriate boundaries of the field. Benbasat & Zmud (2003) themselves offered a relatively broad definition of the IS field as including "understandings of (1) how IT [information technology] artifacts are conceived, constructed, and implemented, (2) how IT artifacts are used, supported, and evolved and (3) how IT artifacts impact (and are impacted by) the contexts in which they are embedded" (p. 186). However, numerous other authors have suggested that in fact, the focus of most IS research is on organizational, and more specifically, business uses of IT. Indeed, Benbasat & Zmud (2003) go on to describe relevant contexts for IS as including collectives such as "groups, work units, organizations" (p. 186).

Recent IS frameworks have proposed similar foci. Avgerou (2000) suggested that the IS field examines applications of IS to support a business, systems development, IS management, organizational value of IS and societal impacts. In noting that the field is centered around organizations, she suggested that because researchers are mostly housed in business schools, little attention has been given to non-business uses or topics. Bacon & Fitzgerald (2001) described the central themes for our field as information for knowledge work, customer satisfaction and business performance, again reflecting a business focus.

In noting this focus, we do not claim that other contexts and uses of IT have never been studied by IS researchers. Instead, we simply argue that they have not been the focus of attention in the field and are outside its core identity, as evidenced by empirical studies of the IS literature. For example, in their review of the computing literature, Glass et al. (2004) found that about 2/3 of papers in a survey of leading IS journals addressed organizational concepts. Sidorova et al. (2008) applied latent semantic indexing to identify topics covered in 1615 MISQ, ISR and JMIS papers over 22 years, then used factor analysis to cluster these topics. They noted the "existence of a stable core of IS research at the *boundary of IT and organizations*" (p. 478) and suggested that the IS discipline focuses on how IT systems are developed and how individuals, groups, organizations, and markets interact with IT.

Controversial Issue: Where Are the Boundaries of the IS Field?

In contrast to the organizational and business focus noted above, there is an increasing diversity of IT applications that involve an IT artifact used outside a specific organization. For example, IT is increasingly used to support diverse kinds of groups working together at a distance, so called virtual teams or virtual organizations (VOs). In organizational settings, such VOs have been a long-standing topic of research in IS. However, as the technology improves, VOs are being applied more widely and beyond traditional work environments. For example, one promising area of application for VOs is to scientific research, using information and communications technologies (ICT) to enable collaboration among scientists (Freeman et al. 2005; Hey et al. 2005) and even with members of the general public (Bonney et al. 2007). However, design of such scientific VOs is still a new area of research, and it is not yet clear how findings from business VOs might apply or the role of IS researchers in studying them.

Going further, ICTs are increasingly used to support collaborations without any clear organizational context. These applications encompass a wide variety of phenomena that can be loosely described as massive virtual collaboration, such as social networking, blogging, free/libre open source software development or Wikipedia editing. Of course, many contributors to and users of open source (for example) do work in organizations, but the connection from these environments to the context of work is not always apparent. Another important development are virtual worlds, 3D systems such as Second Life, in which people, in avatar form, use voice, streaming audio and video, graphics, animations and various forms of text to interact with others and their environment. 3D virtual worlds have been legitimated as business tools thanks in part to Business Week's coverage of Second Life in May 2006, but connect people across many settings.

Perhaps most problematically for IS researchers, systems increasingly enable use and interaction where there is not only no identifiable organizational context, but also no clear output or task. For example, while virtual worlds represent a rich communication platform capable of supporting virtual teams, virtual service delivery and distance education, they are in many cases enjoyed simply as entertainment. Systems such as Facebook let individuals keep in touch with friends, rather than specifically working together. Teenagers' incessant use of mobile phones and digital cameras has no obvious utilitarian value. Such applications of IT are increasingly ubiquitous, but seemingly unconnected to traditional IS concerns or audiences.

At the same time, many consumer products are increasingly digitalized, often driving fundamental shifts in industry dynamics. Most recently, for example, e-book readers such as Amazon's Kindle and most recently Apple's iPad popularized the idea of digital books, fueling various innovations aimed at fundamentally re-shaping "reading" experiences of books, newspapers and magazines. Such digital innovations are likely to cause seismic changes in the vertical industry structures that have been dominated the economy since the World War II. However, studies of consumer use of IT has not been a notable theme for IS research.

What Do IS Researchers Have to Say about these Topics?

In this age of Facebook, the iPad and Second Life, IS research has an unprecedented opportunity to foster collaborative innovation on a global scale by helping to connect innovators from all corners of the world. IS researchers have the opportunity to understand, then apply these results to many facets of daily life in the quest to

make the world a better place. However, for an IS researcher used to working in an organizational setting, the challenge with these environments is that very few organizations and educational institutions are using them extensively. Thus, even though virtual organizations or virtual worlds (for example) represent an important evolution in communication technology and seem likely to make their way into organizations in some form, they are difficult to study in empirical settings that fall squarely within the purview of the IS discipline as currently conceived. Indeed, as their use blurs the boundaries between home and work, work and play, virtual and real, these systems simultaneously threaten to shift organizational and disciplinary definitions.

As a result, studies of these kinds of systems raise difficult questions for the field of IS. A first question is *how useful IS approaches are for studying these phenomena*, or put alternately, *what would be our distinctive competency in examining such phenomena*? This is a question both about theories and methodologies: how well do theories about IT use developed primarily in organizational settings work when applied to discretionary non-work settings? How appropriate are methodologies developed to study business users or markets when applied in other settings? What are the implications for IS academics who would seek to study such systems and uses?

These concerns raise a second question, namely *whether these topics and types of systems belong in IS at all*? Should IS researchers study such systems and IS journals expand their scope to publish their work? Should we revisit the training of IS professionals to include discussion of such topics? Or are we rather seeing the start of a new discipline—a field to which some IS researchers might be well positioned to contribute, but distinct from IS as currently conceived? This question is timely, as these topics are not yet clearly the domain of any particular field, opening the opportunity to claim them through focused research contributions and outreach to interested researchers. But while there is arguably a danger to IS as a field in ignoring these topics, making the field of IS less relevant to current developments, this is balanced by the danger of leaving the IS field less focused and perhaps less relevant to traditional audiences.

One perspective argues that while novel, these topics are still suitable for IS theories and methods, that IS researchers can contribute to their understanding—and further, that studies in these settings make an important contribution to the IS body of knowledge about IT systems and their development, use, management and impacts. For example, IS conceptions of the nature of socio-technical systems and sociomateriality are seemingly as applicable to Second Life as they are to studies of enterprise systems, and understanding of adoption in those settings can inform future systems implementations. Similarly, data elicitation techniques such as interviews and surveys can be fruitfully applied to a variety of settings and users. Drawing on the phenomenological tradition in the IS literature, IS scholars might be able to study new forms of experiences aided with digital technology and their meanings in everyday life. Furthermore, it seems inevitable that these technologies will eventually find their way into organizations, just like email and the Web. Thus, the decision for IS researchers to legitimize these systems as a topic of study can be framed in temporal terms: do we wait until these systems are used in organizations or do we study them *before* they are used? An argument to study them now is a vote for providing insight and guidance to organizations seeking to incorporate these systems.

However, expanding the boundaries of IS research has implications for academics and practitioners. For academics, new research domains will require adaptation of theories and methods. For example, researchers will have to address challenges such as identifying subjects from a distributed and sometimes anonymous user base. An example of a novel challenge for IS practitioners is to make an organizational case for investing in social media, which are typically platforms that rely on third-party generated applications and content to complete them. Like open source software, this infrastructure affords both the platform provider and the user organization limited control and makes corporate contracting extremely difficult.

An alternative perspective is that the distributed and online nature of many of these systems demands new theoretical perspectives and approaches, essentially creating a new field of study. For example, some have argued for an emerging science of networks that examines the interconnections among information networks, cognitive and semantic networks and social networks. Network science as conceived is truly multidisciplinary, as physicists, biologists, sociologists and other researchers collaborate to create new research approaches. IS research can play a key role in this mix, as IT is an integral part of collective intelligence-based organizations, but forms only part of this emerging science.

Similarly, in their studies, IS scholars can go beyond traditional methodologies by leveraging the digital traces of human activities in online systems, employing sequence mapping techniques from genetics or even using fMRI technology, as in the study of virtual reality. However, these new techniques pose challenges for researchers who need to learn to apply them, as well as for reviewers, editors and readers who need to evaluate and learn from their

use. Again, it may be that such developments are best seen as the hallmark of the emergence of a new field. Indeed, this new field may find its home outside of business schools, e.g., in Schools of Information or Informatics.

Regardless, with a newly expanded domain of inquiry, it seems clear that we need some domain of research to study the nature and consequences of the digital mediation of everyday experiences. Studying the transformation of every day experiences allows us to draw on a strong intellectual tradition in the IS discipline that examined the consequences of organizational work practices and structure through the use of information technology. The IS community has developed a rich repertoire of theoretical language and methodological tools to study IT-enabled changes. These theories and methodological tools do not have to be confined within the boundary of organizations. As digital technology continues to expand its influence on everyday lives, IS scholars can employ these theoretical and methodological tools to study how we construct and reconstruct our world—both real and artificial—and thus shape our experiences. This is a call to return to the roots of our discipline as a science of the artificial that deeply engages in the design and study of information systems artifacts, in all contexts and settings.

Panel Structure

The panel will start with a short introduction to the topic of the panel by the moderator (Crowston), followed by short presentations by the panelists describing how the study of these systems has been informed by and contributes to IS research, with specific statements on the questions discussed above. After the panel presentations, the audience will be invited to participate, e.g., by introducing novel topics that might be addressed by IS researchers, experiences (good and bad) researching non-organizational uses of IT, descriptions of emerging or inter-disciplinary fields to which IS research might contribute or cautionary statements on the prudent limits of the IS field.

Panelists have been selected based on their research, publications and scholarly leadership on topics relevant to the field, such as open source software development, eScience and citizen science, network science, virtual worlds and ubiquitous computing, as well as for geographic distribution across multiple AIS regions. The panel is designed to address a controversial topic: while two of the panelists (Schultze and Fitzgerald) take the position that the kinds of system discussed above are an integral part of the field of IS, two others (Gloor and Yoo) argue that a new field is emerging distinct from IS and that interested IS researcher can and should position themselves in it.

Biographies and Panelist Positions

Kevin Crowston (moderator) is a Professor in the School of Information Studies at Syracuse University. Specific research topics related to the panel include the development practices of Free/Libre Open Source Software teams and work practices and technology support for citizen science research projects, both with NSF support. Crowston will open the panel by introducing the panelists and briefly presenting the background and motivation for the panel. He will also briefly discuss his studies of the application of IT to support citizen science projects, that is, research projects involving "partnerships between volunteers and scientists that answer real-world questions" (Bonney et al. 2007). These project-based partnerships are a form of virtual organization, but with unique characteristics due to the nature of the task and the open model for participation.

Brian Fitzgerald is Vice-President Research at the University of Limerick, Ireland, where he holds an endowed professorship, the Frederick A. Krehbiel II Chair in Innovation in Global Business & Technology. His research interests lie primarily in software development, encompassing development methods, global software development, agile methods and open source software. He also written specifically on the issue of identity of the IS field (Adam et al. 1996). Fitzgerald will discuss his studies of open source software development and use. Some of these studies have been situated in organizations and thus follow the traditional model of IS research. However, others have focused on the distributed development practices and thus have explored new approaches to data collection and analysis, though informed by IS practice. Overall he will argue for a position that IS can evolve to focus on new topics where the IT artifact is central. This may affect the "centre of gravity" of the field over time, but the field has already undergone such shifts, which in itself is a positive sign.

Peter A. Gloor is a Research Scientist at the Center for Collective Intelligence at MIT's Sloan School of Management. Gloor will discuss the role of IS in studying social media and argue for the emergence of a new field of network science. Humans are a product of their social networks, something that becomes more and more relevant to IS as these networks move online. Online networks could not exist without ICT, which makes integrating network science into IS research crucial. After hours use of online social networks is exploding. From students to startups, from families to multinational corporations, systems like Facebook and Twitter have become indispensable tools

melding the real with the virtual world. An example research question from network science is: do we choose our networks based on "people like me" (homophily), or do pre-existing relationships shape behavior and attributes? IS researchers can contribute to solving this conundrum in many ways, for example studying the impact of individual networking on organizational behavior on different levels.

Ulrike Schultze is Associate Professor in Information Technology and Operations Management at Southern Methodist University. Her more recent research projects are in the area of Internet-based technologies and their implications for customer co- and peer-production. She is currently engaged in a NSF-funded study on the avatar-self relationships enacted in *Second Life*. Schultze will discuss her study of Second Life (SL). To address the challenges of doing research in virtual worlds, Schultze sought to identify a phenomenon that was central enough to the IT artifact that it could withstand challenges related to the empirical context of the study, selecting the avatar-self relationship in particular. Based on this work, Schultze will argue for a position that IS research needs to remain relevant to organizational audiences. Nevertheless, IS researchers can and should study the use of information and communication technologies outside of organizational boundaries, especially if these technologies are relevant to organizational work. The challenge IS researchers who do study IT-related practices in non-organizational settings face, is the need to normalize the insights and make them relevant to organizational audiences.

Youngjin Yoo is Associate Professor in Management Information Systems and Irwin L. Gross Research Fellow at the Fox School of Business and Management at Temple University. He is currently studying digital innovations and its organization and industrial consequences. Currently, he is co-editing a special issue of *Organization Science* on digital innovation. He is also conducting an NSF-funded study to use genetic sequence analysis techniques to study DNA of digitally mediated organizational routines and their mutations. Yoo will argue that a radical new discipline is likely to emerge around the design and use of digital artifacts, and that the IS community must be a part of that new discipline, if not lead it. The new discipline should embrace design scholarship, emphasizing the constructive engagement with increasingly digitalized artificial worlds (in the Simonian way) through the creation of new vocabulary. In particular, he will emphasize the generative nature of digital technology and how it fundamentally changes our experience of the artificial worlds. He will then discuss new methods that are specifically designed to address the generative nature of digitalized artificial worlds.

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References

Adam, F., and Fitzgerald, B. "A Framework for Analysing the Evolution of the IS Field: Can IS become a Stable Discipline?," *Proceedings of the European Conference on Information Systems*, Lisbon, 1996, pp. 17–32.

Avgerou, C. "Information systems: What sort of science is it?," *Omega* (28) 2000, pp 567–579.

Bacon, C.J., and Fitzgerald, B. "A systemic framework for the field of information systems," *Database for Advances in Information Systems* (32:2) 2001, pp 46–67.

Benbasat, I., and Zmud, R.W. "The identity crisis within the IS discipline: Defining and communicating the discipline's core properties," *MIS Quarterly* (27:2) 2003, pp 183–194.

Bonney, R., and Shirk, J.L. "Citizen Science Central," in: *Connect*, 2007, pp. 8-10.

Freeman, P.A., Crawford, D.L., Kim, S., and Muñoz, J.L. "Cyberinfrastructure for science and engineering: Promises and challenges," *Proceedings of the IEEE* (93:3) 2005, pp 682–691.

Glass, R.L., Ramesh, V., and Vessey, I. "An analysis of research in computing disciplines," *Communications of the ACM* (47:6) 2004, pp 89–94.

Hey, T., and Trefethen, A.E. "Cyberinfrastructure for e-science," *Science* (308:5723), May 2005, pp 817–821.

Sidorova, A., Evangelopoulos, N., Valacich, J.S., and Ramakrishnan, T. "Uncovering the intellectual core of the information systems discipline," *MIS Quarterly* (32:3) 2008, pp 467–482.

Simon, H.A. *Sciences of the Artificial*, (2nd ed.) MIT Press, Cambridge, 1981.