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Information Technology-Enabled Transformation: Research That Bridges the Functional Divide

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INFORMATION TECHNOLOGY-ENABLED TRANSFORMATIONS: RESEARCH THAT BRIDGES THE FUNCTIONAL DIVIDE

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The field of information systems can do more to clarify the significance of its research in relation to other management disciplines. Few external stakeholders, including faculty in other fields, deans, practitioners, senior managers, and policy makers, are able to identify common topics in IS research, and fewer still know what it is that draws IS researchers to a particular problem or an unexplained phenomenon. This panel considers the proposition that understanding IT-driven transformations is one of the core themes of the IS research field. The panel focuses on the role that research on IT-enabled transformations can play in offering a compelling story about the field and its scholarly and practical contributions. Because IT-enabled transformations inevitably influence and are influenced by a range of environmental and contextual factors, these phenomena cannot be examined in isolation and must necessarily draw upon theories and insights developed in other functional disciplines. Transformations are non-incremental, leap-frogging advances in the use of IT that reshape markets, radically alter cost structures, and lead to entirely new digital products. Focusing on the role of research in knowing what gives rise to IT-enabled transformations (and how various players and organizations will succeed or are disrupted) bridges the different areas of IS research, and offers the most compelling story about our field to those outside it.

IT has created frame-breaking changes and discontinuities for a variety of industries and organizations. Information technology is associated with transformations in the tasks people perform, the time and place of work, the way organizations are structured, new business models, work processes, disintermediation and re-intermediation, and a movement toward customer self-service over the Internet, to name a few impacts. The technology both stimulates and enables these transformations. Advances in technology that provide new capabilities and much better cost/performance ratios make investing in new IT innovations more attractive to organizations. It is the combination of managerial innovation and IT that casts the technology in a transformational role. The Internet is an example of a new technology that has changed the way in which organizations operate, structure themselves, and offer goods and services to their customers. Technology made the Internet possible, but individuals and organizations developed specific ways to innovate with the Internet.

What constitutes a transformation? In an empirical study of punctuated equilibrium, Romanelli and Tushman (1994) defined a revolutionary transformation as one that occurred when they found changes in three major organizational conditions—strategy, structure, and power—within any two-year time period. A more recent study (Dehning et al. 2003) of excess stock market returns related to news of company investments in transformational technologies defined technology transformations as events that

- Fundamentally alter traditional ways of doing business by redefining business capabilities and/or (internal or external) business processes and relationships.
- Potentially involve strategic acquisitions to acquire new capabilities or to enter a new marketspace.
- Exemplify the use of IT to dramatically change how tasks are carried out…is the move recognized as being important in enabling firm to operate in different markets, serve different customers…gain considerable competitive advantage by doing things differently.

Because organizations, markets, and industries are all different, it is difficult to provide a quantitative guideline for what constitutes a transformation. A five-fold or ten-fold improvement in the productivity of a business process would qualify, as would an 80 to 90 percent decrease in cost as exemplified by retail stock commissions from 1990 to 2000. Authors must convince editors and readers that the subject of their research is truly a transformation as opposed to an incremental improvement in a process.

Conducting research on transformation is a challenge that requires the application of diverse methodologies and theories. Researchers may explore the transformation of an industry or a single organization. They may rely on theory developed in strategy, marketing, finance, and the like. Methodologies will range from econometric analyses to an historical study of a transformation.

The panelists will offer different perspectives on IT-enabled transformations, from supporting the proposition that IT transformations are highly significant to taking the position that IT has not impacted the fundamental processes of markets and industries. Each panelist will be limited to an eight minute opening statement so the majority of the time for the panel will be for discussion with the audience.

- Hank Lucas: Defining an IT-enabled transformation and panel moderator
- Ritu Argarwal: Transforming and informating health care through IT
- Michael Barrett: Perils of transformation; implementing change, developing new organization forms, restructuring work relationships
- Sirkka Jarvenpaa: IT-enabled transformation in the U.S. financial reporting sector: looking at the timing and interdependencies of the levers of transformation
- Bruce Weber: A dissenting view: virtual financial services are no different from traditional services; the same fundamental economic forces are at work with IT as with traditional markets

References

Dehning, B., Richardson, V. J., and Zmud, R. W. "The Value Relevance of Announcements of Transformational Information Technology Investments," *MIS Quarterly* (27:4), December 2003, pp. 637-656.

Romanelli, E., and Tushman, M. "Organizational Transformation as Punctuated Equilibrium: An Empirical Test," *Academy of Management Journal* (37:5), October 1994, pp. 1141-1166

About the Panelists

Ritu Agarwal is professor and the Dean's Chair of Information Systems at the Robert H. Smith School of Business, University of Maryland, College Park. She is also the Director of the Center for Health Information and Decision Systems at the Smith School. Ritu has published over 75 papers on information technology management topics in journals such as *Information Systems Research*, *MIS Quarterly*, *Communications of the ACM*, *Journal of Management Information Systems*, *Decision Sciences*, *IEEE Transactions*, and *Decision Support Systems*, and has made presentations at a variety of national and international conferences. She has expertise in the management of information technology in organizations. Her current research is focused on the use of IT in healthcare settings, how organizations derive value from information technology through adoption, diffusion, and creative use, and appropriate strategies for the management of IT human capital. Ritu has worked extensively with Fortune 500 companies including 3M, Freddie Mac, Dow Chemicals, Rohm and Haas, AstraZeneca, and NCR on a variety of research and consulting engagements and made several presentations to groups of senior IT and business executives. Her research has been sponsored by the Society for Information Management, U.S. Department of Labor, and DARPA. She is also active in executive education, and participates in the Smith School's Executive MBA program. Ritu is currently serving as a Senior Editor for *Information Systems Research*, and an Associate Editor for *Management Science*. Other editorial appointments include *MIS Quarterly Executive*, *Journal of the Association of Information Systems*, *IEEE Transactions on Engineering Management*, *Decision Support Systems*, and *Information Technology and Management*. She is a member of ACM, AIS, INFORMS, and the Academy of Management. Ritu currently serves on the INFORMS board as Vice President for Subdivisions.

Michael Barrett is a faculty member in Information Systems and e-Business at the Judge Institute of Management, Cambridge University, where he is also Director of the MPhil program in Management. His research interests are in the area of information systems innovation and organization change with a particular interest in global knowledge management. He heads up a research

group which is studying the business and social implications of RFID adoption in the manufacturing and healthcare sectors. His work is of an interdisciplinary nature, and he has published in a variety of journals including *Information Systems Research*, *Academy of Management Journal*, and *Accounting, Organizations, and Society*. Michael has worked previously in consulting with Oracle Canada Corporation and Colgate Palmolive Ja. Ltd. He continues to research and provide executive development programs with a number of organizations including IBM, HP, BT and the World Health Organization.

Sirkka L. Jarvenpaa is the James Bayless/Rauscher Pierce Refsnes Chair in Business Administration at the University of Texas at Austin, where she also serves as Director of the Center for Business, Technology and Law and a Track Leader in the cross-functional Customer Insight Center. She is the editor-in-chief of *Journal of Association for Information Systems* and joint editor-in-chief of *Journal of Strategic Information Systems*. In December 2002, she completed her term as senior editor of *Information Systems Research*. She has served in many chair roles (program, Ph.D. consortium, planning) for the International Conference on Information Systems. She has also held a vice president position in the Association for Information Systems. Her research examines a variety of IT-enabled transformations. She is a frequent contributor in industry forums on business strategy and information technology.

Henry C. Lucas, Jr. is the Robert H. Smith Professor of Information Systems at the Robert H. Smith School of Business, the University of Maryland. He received a B.S. from Yale University and an M.S. and Ph.D. from the Sloan School of Management, M.I.T. Hank's research interests include the impact of information technology on organizations, IT in organization design, electronic commerce, and the value of information technology. He is the author of a dozen books and more than 70 articles in professional periodicals on the impact of technology, information technology in organization design, the return on investments in technology, implementation of information technology, decision-making for technology, and information technology and corporate strategy. His most recent books include *Information Technology: Strategic Decision Making for Managers* (Wiley, 2005), *Beware the Winners Curse: Victories That Can Sink You and Your Company* (with G. Anandalingham, Oxford University Press, 2004), *Strategies for E-Commerce and the Internet* (MIT Press, 2002), *Information Technology and the Productivity Paradox: Assessing the Value of Investing in IT* (Oxford University Press, 1999), and *The T-Form Organization: Using Technology to Design Organizations for the 21st Century* (Jossey-Bass, 1996). He served as vice president of publications for the Association for Information Systems from 1995 to 1998 and as editor-in-chief of the AIS electronic journals, *Communications of AIS* and *Journal of AIS*, from 1998 to 2002. He has served on the faculties of Stanford University and New York University, and has spent sabbaticals at the IBM Systems Research Institute in La Hulpe, Belgium, INSEAD in Fontainebleau, France, and Nanyang Technological University in Singapore.

Bruce W. Weber is an associate professor of Information Management at the London Business School. His research interests include the analysis of securities market mechanisms using computer simulation, modelling and experimental economics, new financial technologies, and performance metrics for electronic business activities. Bruce is the codeveloper (with Robert A Schwartz) of the TraderEx market simulation and the "Head Trader" simulation on the Nasdaq website. He is an editorial board member of *Information Systems Research*, *Journal of Management Information Systems*, and *Electronic Markets—The International Journal of Electronic Commerce*, and cochair of the Global Equity Markets Seminar (GEMS) on Trading and Market Structure (with R. Schwartz and B. Steil). He has served on the faculties of the Stern School at New York University and the Zicklin School of Business, Baruch College/CUNY, where he was founding director of the Wasserman Trading Floor, a 60-workstation financial markets education center. Bruce has an AB from Harvard and an MA and Ph.D. from the Wharton School.