



Twenty-First Annual International Conference on Information Systems

Brisbane, Australia

December 10-13, 2000

ICIS Conference Committee 2000

Conference

Bernie Glasson, Curtin University of Technology
Ron Weber, University of Queensland

Program

Soon Ang, Nanyang Business School, Singapore
Helmut Krcmar, University of Hohenheim
Wanda Orlikowski, Massachusetts Institute of Technology
Peter Weill, University of Melbourne/Massachusetts Institute of Technology

Doctoral Consortium

Ross Jeffery, University of New South Wales
Mats Lundberg, Stockholm School of Economics
Iris Vessey, Indiana University

Junior Faculty Consortium

Dennis Galletta, University of Pittsburgh
Fred Niederman, Saint Louis University

Sponsors

Celia Romm, Central Queensland University
Alan Underwood, Queensland University of Technology
Michael Vitale, Australian Graduate School of Management
Graham Winley, University of Wollongong

Placement

Steward Leech, University of Tasmania
Sandy Staples, Queen's University

Exhibits

Paula Swatman, Royal Melbourne Institute of Technology
Peter Seddon, University of Melbourne

Finance

John Heales, University of Queensland

Publicity

David Arnott, Monash University
Graham Pervan, Curtin University of Technology

Affiliated Organizations

Michael Myers, University of Auckland

International Liaisons

Roger Clarke, Xamax Consultancy
Chrisanthi Avgerou, London School of Economics
M. Lynne Markus, Claremont Graduate University and City University of Hong Kong

Local Arrangements

Peter Green, University of Queensland

Doctoral Consortium Local Arrangements

Colin Ferguson, University of Queensland
Paul O'Brien, University of Queensland

Proceedings

Janice I. DeGross, University of Minnesota

Executive Director

Ephraim McLean, Georgia State University

ICIS Administrative Support

Jennifer Davis, Georgia State University
Kiesi Julian, Georgia State University

Fundamental Concepts for the New Millennium

In association with



Special Interest Group on Management Information Systems,
Association for Computing Machinery



College on Information Systems,
INFORMS



Association for Information Systems



The Society for Information Management



Technical Committee 8: Information Systems,
International Federation for Information Processing



International Academy for Information Management

Welcome to ICIS 2000 and Brisbane

G'day, and welcome to ICIS2000 and to Brisbane, Australia.

On behalf of the ICIS2000 Conference Committee and our Australian colleagues, we would like to extend a warm welcome to you upon your visit to the Land Down Under. This Twenty-First Annual International Conference on Information Systems marks two "firsts": it is the first ICIS of the new Millennium; and it is the first time ICIS has been held in the Southern Hemisphere. We hope you enjoy the Conference, the location, and our summer climate.

The Conference theme is "Fundamental Concepts for the New Millennium." The information systems discipline is characterized by dramatic change. Too often we get caught up in current developments and lose sight of the need to identify enduring concepts and theories that enable us to make sense of each new wave of change. At the end of one Millennium, ICIS2000 provides an opportunity for us to reflect on how well we have developed core, fundamental knowledge that will facilitate our coping with even faster rates of change in the new Millennium. Our theme for the Conference challenges us to take stock of our discipline.

This year we had 384 submissions for the Conference program. Ninety-five submissions were accepted for presentation at the

Conference. We have the largest number of submissions and the largest program of any International Conference on Information Systems. You can select from a feast of completed research papers, research-in-progress papers, teaching cases, tutorials, panels, and debates.

Our sincere thanks go to our colleagues on the Conference Committee and to many other colleagues not on the Committee for their dedication, assistance, and countless hours of work. In particular, we wish to thank our Program Committee and the large number of Reviewers for the enormous amount of work that they have done to put together our program. We are most grateful to everyone for their goodwill and support.

Finally, we wish to thank our sponsors and exhibitors for their financial support and their in-kind support. Without them, the International Conference on Information Systems would not be possible in its current, high-quality form. Please take some time during the Conference to thank our sponsors and exhibitors for their support.

Bernie Glasson
Ron Weber
Conference Co-Chairs

About Brisbane

Brisbane, the capital city of Queensland, is located just over half-way along Australia's eastern coast on the Pacific Rim. A subtropical capital, Brisbane is renowned for its continuous sunshine and balmy weather.

With a population of 1.6 million people, Brisbane is a modern city that provides world class conference facilities and luxurious hotel accommodation. All major facilities are closely located within the CBD, which is settled compactly on the picturesque Brisbane River. The city is accessible via major airline routes and boasts a newly unveiled, state-of-the-art international airport.

Locals and visitors alike embrace Brisbane's fantastic weather with the enjoyment of many outdoor pursuits. As such, the city is dotted with parks, riverside promenades, open-air restaurants and entertainment facilities. Combined with colorful markets, world-class retail shopping, and on-going cultural and artistic events, Brisbane is a city that welcomes its guests with festivity and relaxation.

Brisbane is in close proximity to some of Australia's most beautiful destinations, including the rainforest haven of the world heritage listed Fraser Island, the glamour of the Gold Coast, and the famous sandy beaches of Australia's eastern seaboard. Also being one of Australia's northernmost cities, Brisbane is a convenient starting point from which international visitors can explore the delights of Australia.

Progressive, cosmopolitan and extremely friendly summarizes Brisbane, which, with its established infrastructure and excellent locality, is a superb destination at which to balance work and leisure pursuits.

Keynote Speakers



John Leslie King

is Dean and Professor in the School of Information at the University of Michigan. His research concerns the development of high-level requirements for information systems design and implementation in strongly institutionalized production sectors. The goal of this work is to improve the design of information technologies for both organizational and institutional usability, through better articulating the processes of requirements

analysis, specification, and prototype creation. The work also informs policy and strategy development at the firm, sectoral, and institutional levels. Recent and current projects focus on the role of technical and institutional forces in the co-evolutionary development of intermodal transport and logistics, case management in felony criminal courts, global land-line and cellular telephony, and the transition of the automobile industry from a product to service sector. A new project supported by NSF focuses on the institutional forces involved the development of global electronic commerce. Dr. King served as Editor-in-Chief of the journal *Information Systems Research* from 1993-1998, and served as Marvin Bower Fellow and Visiting Professor at the Harvard Business School in 1990. From 1980-1999 he was Professor of Information and Computer Science and Management at the University of California, Irvine. He holds a B.A. degree in Philosophy and a Ph.D. in Administration from UCI.

Steve Hibbard

is Chief Executive of Lonely Planet Publications. Lonely Planet began in the early 1970s after founders Tony and Maureen Wheeler completed an overland journey from London through Asia and on to Australia. Recently married, they took the trip in a hopeless attempt to get travel out of their systems before settling into "real world" jobs. After arriving in Australia, the Wheelers were approached by so many other travelers

with questions about their trip that they decided to publish a book about it. Written at their kitchen table and hand-collated, trimmed and stapled, that book, *Across Asia on the Cheap*, became the first Lonely Planet guidebook and an instant local bestseller.

Today there are 500 Lonely Planet employees working in offices in Melbourne, Australia; Oakland, California; London, and Paris, plus a crew of experienced authors traveling and writing around the globe. While Lonely Planet initially covered far-flung destinations for budget travelers, its scope has widened to cover the most popular spots on earth and to offer good value options for travelers in all price brackets. Each year Lonely Planet donates a percentage of its profits to organizations benefitting the people and places it covers.

Steve has an MBA from the University of Melbourne and an undergraduate degree from the College of Wooster in Ohio. He has been the chief executive of Lonely Planet for six years. During that time, sales have grown from \$14 million to \$65 million with a corresponding increase in the number and diversity of products. The company has also undergone a successful transition from book publisher to provider of travel information in any media. While the range of books available now extends to special interest guides (e.g. health, first time travel and restaurant guides), Lonely Planet is also producing interactive travel products for handheld computers as well as diversifying into services for travelers such as the eKno telecommunications card. The award-winning Lonely Planet website (www.lonelyplanet.com.au) currently attracts 2 million unique visitors per month.



Conference Information

Junior Faculty Consortium

The Junior Faculty Consortium on Sunday, December 10 (9:00 a.m. to 4:00 p.m.), at the Rydges Hotel is intended to provide a forum where folks entering the field can interact with peers and “counselors”—colleagues in middle and later career stages—to help develop a strong context for providing value to others through research, teaching, and service. In addition, we encourage networking among new faculty and increasing appreciation of the similarities and differences of academic systems in different parts of the world.

The session will emphasize small group interaction with counselors working on three continents in schools ranging in their teaching, research, and service emphases, including Cynthia Beath, Roger Clarke, David Feeny, Dennis Galletta, John L. King, Tor Larsen, Fred Niederman, Edward Stohr, and Liisa von Hellens. Cost: US \$25 to cover lunch and facilities (preregistration required).

Opening Reception

The Opening Reception, sponsored by the Conference and the Association for Information Systems, will be held from 6:00 p.m. to 8:00 p.m. on Sunday, December 10, in the Plaza Foyer.

Conference Dinner

The Conference Dinner will be held in the Plaza Ballroom on Tuesday evening, December 12, from 7:00 p.m. until 11:00 p.m.

Placement

In collaboration with the Association for Information Systems (AIS), the placement service will include World Wide Web postings for both universities and candidates so that up-to-date information is always available. The cost of placement registration, for both AIS and ICIS listings, is US \$250 for schools and US \$50 for job applicants. The fee entitles universities and applicants to link their own Web page to the central AIS/ICIS Web page. Registration for placement is on-line. Additional information is available at:

<http://www.aisnet.org/placement/>

Through most of the Conference, even after posted hours, over 40 tables will be available for interviewing. Full support (placement chairperson, bulletin boards, and e-mail) will be available in the Placement area of the Plaza Ballroom during the posted hours below.

Placement Hours

Sunday	10 December	9:00 a.m.— 5:00 p.m.
Monday	11 December	8:00 a.m. — 5:00 p.m.
Tuesday	12 December	8:00 a.m. — 5:00 p.m.

E-Mail Services/Internet Access on Site

This service will be available in the Plaza Corridor (outside Plaza 6). In addition, a Message Board will be maintained near the Registration area.

Exhibits

Exhibitors, including book publishers and information technology vendors, will display resource materials for use in teaching, research, and business. Exhibits are located in the Plaza Foyer.

Exhibit Hours

Sunday	10 December	3:00 p.m. — 8:00 p.m.
Monday	11 December	8:00 a.m. — 6:00 p.m.
Tuesday	12 December	8:00 a.m. — 6:00 p.m.
Wednesday	13 December	8:00 a.m. — 12:00 noon

Future Conferences

ICIS 2001 will be held in New Orleans, Louisiana, December 16-19, 2001. The Conference Co-chairs are Joey George, Florida State University, and Blake Ives, Tulane University/Louisiana State University. The conference theme is “2001: A Digital Odyssey” — exploring how information technology has transformed our lives and organizations. Visit the conference web site at

<http://isds.bus.lsu.edu/icis2001/>

Subsequent conferences will be held in Barcelona, Spain (2002), Jerusalem, Israel (2003), and Washington, DC (2004). Site selection procedures and criteria are available at

<http://www.icisnet.org/siteselection/guidelines.shtml>

Proposal guidelines may be obtained from Eph McLean (emclean@gsu.edu) or the ICIS Administrative Office at

info@icisnet.org

Proceedings

Each conference registrant will receive a copy of the Conference proceedings on CD-ROM. Additional copies, paper or CD-ROM, may be purchased on-site for US \$70.00. Copies of this and all prior ICIS proceedings are available from:

ICIS Administrative Office
P.O. Box 2672
Atlanta, Georgia, USA 30301-2672
Phone: +1-404-651-0348 or +1-404-651-0258
Fax: +1-404-651-4938
E-mail: info@icisnet.org

Conference Schedule

Sunday, December 10

9:00 a.m.–5:00 p.m. Plaza Ballroom	AIS/ICIS Placement
9:00 a.m.–4:00 p.m. Rydges Hotel	Junior Faculty Consortium (pre-registration required)
3:00 p.m.–8:00 p.m. Plaza Foyer	Exhibits
1:00 p.m.–8:00 p.m. Plaza Foyer	Conference Registration
6:00 p.m.–8:00 p.m. Plaza Foyer	Opening Reception Sponsored by ICIS and AIS

Monday, December 11

7:00 a.m.–8:00 a.m. Plaza Foyer	Continental Breakfast
7:30 a.m.–4:00 p.m. Plaza Foyer	Conference Registration
8:00 a.m.–5:00 p.m. Plaza Ballroom	AIS/ICIS Placement
8:00 a.m.–6:00 p.m. Plaza Foyer	Exhibits
8:30 a.m.–10:00 a.m. Session M1.1 Plaza 6	Opening Plenary Session Chair: Wanda J. Orlikowski, Massachusetts Institute of Technology Keynote Address: John L. King, Dean, School of Information, University of Michigan “We Were Right and They Were Wrong”
10:00 a.m.–10:30 a.m.	Break — Refreshments
10:30 a.m.–12:00 noon Session M2.1 Plaza 3	Research in Progress Human Resources and Training in IT Chair: Teresa Shaft, University of Oklahoma Paper: “The Impact of Human Resources Practices on IT Personnel Commitment, Citizenship Behaviors, and Turnover Intentions,” Guy Paré, Michel Tremblay, and Patrick Lalonde, HEC – Montreal Paper: “Boot Camp or Bordello: Whipping Rookies into Shape,” June Bradley, Bradley Mann Consulting, and G. Michael McGrath, Macquarie University Paper: “Integrating Three Theoretical Perspectives to Explain Internet-Based Technology Usage by University Students: A Qualitative Study,” Sabine G. Hirt and Moez Limayem, City University of Hong Kong

Session M2.2 Plaza 2	Completed Research Chair Paper Discussant Paper Discussant:	Economics of Information Goods Sanjeev Dewan, University of Washington “Versioning Information Goods with Network Externalities,” Bing Jing, University of Rochester Ken Peffers, Texas Tech University “Information Complements, Substitutes, and Strategic Product Design,” Geoffrey Parker, Tulane University, and Marshall Van Alstyne, University of Michigan Kerem Tomak, University of Texas, Austin
Session M2.3 Plaza 4	Completed Research Chair Paper Discussant Paper Discussant	Intelligent Retrieval and Personalization Nirup Menon, Texas Tech University “An Approach to Intelligent Query and Component Retrieval for Web-Based Repositories,” Vijayan Sugumaran, Oakland University, and Veda C. Storey, Georgia State University Gavin Finnie, Bond University “Personalization of Search Engine Services for Effective Retrieval and Knowledge Management,” Weiguo Fan and Michael D. Gordon, University of Michigan, and Praveen Pathak, Purdue University Jerome Yen, Chinese University of Hong Kong
Session M2.4 Plaza 5	Completed Research Chair Paper Discussant Paper Discussant	Perspectives on IT Use Terri Griffith, University of California, Berkeley “Issues in Predicting and Explaining Usage Behaviors with the Technology Acceptance Model and the Theory of Planned Behavior When Usage Is Mandatory,” Patrick Rawstorne, Rohan Jayasuriya, and Peter Caputi, University of Wollongong David Gefen, Drexel University “Technological Capacitation in Customer Service Work: A Socio-technical Approach,” Stephen Corea, London School of Economics Nick Letch, University of Western Australia
Session M2.5 Plaza 1	Panel Chair Panelists	Fundamental Concepts and Approaches for Investigating Virtual Teamwork Sajda Qureshi, Erasmus University Rotterdam Doug Vogel, City University of Hong Kong Sirkka Jarvenpaa, University of Texas, Austin Kathy Chudoba, Florida State University
Session M2.6 Plaza 6	Tutorial Chair Tutorial	Developing Data Collecting Agents Roger Chiang, University of Cincinnati “Developing Internet Agents: A Tutorial Using Visual Basic 6.0,” Gove N. Allen, University of Minnesota, and Salvatore T. March, Vanderbilt University
12:00 noon–2:00 p.m. Plaza Ballroom	Lunch	Conference Awards
2:00 p.m.–3:30 p.m.		
Session M3.1 Plaza 1	Research in Progress Chair Paper Paper Paper	ERP and Transformational Change Deborah Armstrong, University of Kansas “The Impact of Enterprise Resource Planning Systems on Firm Performance,” Robin Poston and Severin Grabski, Michigan State University “A Delphi Examination of Public Sector ERP Implementation Issues,” She-I Chang, Guy Gable, Errol Smythe, and Greg Timbrell, Queensland University of Technology “A Contingency Analysis of Post-Bureaucratic Controls in IT-Related Change,” May Tang, Siew Kian Sia, Christinia Soh, and Waifong Boh, Nanyang Technological University

Session M3.2 Plaza 2	Research in Progress	Competition in the Electronic Markets
	Chair	Vidyanand Choudhary, Carnegie Mellon University
	Paper	“Competition Across Channels: Do Electronic Markets Complement or Cannibalize Traditional Retailers?” Sivakumar Viswanathan, New York University
	Paper	“Mechanisms for Coping with Unfair Ratings and Discriminatory Behavior in Online Reputation Reporting Systems,” Chrysanthos Dellarocas, Massachusetts Institute of Technology
	Paper	“Clicks vs. Bricks: Toward a Model of Internet-Induced Channel Competition,” Paul Chwelos, University of California, Irvine, and Michael J. Brydon, Simon Fraser University
Session M3.3 Plaza 3	Completed Research	Software Development and Maintenance
	Chair	M. S. Krishnan, University of Michigan
	Paper	“A Framework Analysis of the Open Source Software Development Paradigm,” Joseph Feller and Brian Fitzgerald, University College Cork
	Discussant	Benjamin Grosf, Massachusetts Institute of Technology
	Paper	“Factors Affecting Information System Volatility,” Jon Heales, University of Queensland
	Discussant	David Darcy, University of Maryland
Session M3.4 Plaza 6	Debate	A Debate on the Blindness of IS Journal Reviews
	Moderator	Detmar W. Straub, Georgia State University
	Debators	Daniel Robey, Georgia State University
		Robert Zmud, University of Oklahoma
Session M3.5 Plaza 4	Completed Research	Understanding IS Success/Failure
	Chair	Rudy Hirschheim, University of Houston
	Paper	“Toward Social Constructivist Understandings of IS Success and Failure: Introducing a New Computerized Reservation System,” Nathalie Mitev, London School of Economics
	Discussant	Ojelanki Ngwenyama, Virginia Commonwealth University
	Paper	“The Politics of IS Evaluation: A Social Sharing Perspective,” Melanie Wilson, University of Manchester, and Debra Howcroft, University of Salford
	Discussant	Manju Ahuja, Florida State University
Session M3.6 Plaza 5	Completed Research	From Negotiation to Collaboration
	Chair	Paul Hart, Florida Atlantic University
	Paper	“Computer-Supported Negotiations: An Experimental Study of Bargaining in Electronic Commerce,” Khim-Yong Goh, University of Chicago, Hock-Hai Teo, Haixin Xu, and Kwok-Kee Wei, National University of Singapore
	Discussant	Tung Bui, University of Hawaii
	Paper	“Using Electronic Media for Information Sharing Activities: A Replication and Extension,” D. Sandy Staples, Queen’s University, and Sirkka L. Jarvenpaa, University of Texas, Austin
	Discussant	Bernard Tan, National University of Singapore
3:30 p.m.–4:00 p.m.	Break — Refreshments	

4:00 p.m.–5:30 p.m.

Session M4.1 Plaza 2	Research in Progress Chair Paper Paper Paper	Trust and E-Commerce Dennis Galletta, University of Pittsburgh “Trust in E-Commerce Vendors: A Two-Stage Model,” D. Harrison McKnight, Florida State University, Vivek Choudhury, University of Cincinnati, and Charles Kacmar, Florida State University “Initial Trust, Perceived Risk, and the Adoption of Internet Banking,” Kyu Kim, University of Cincinnati/Inha University, and Bipin Prabhakar, University of Cincinnati “Trading Partner Trust in Electronic Commerce Participation,” Pauline Ratnasingham, Victoria University of Wellington, and Kuldeep Kumar, Florida International University
Session M4.2 Plaza 3	Research in Progress Chair Paper Paper Paper	User Satisfaction, Preferences, and Performance Barbara Klein, University of Michigan, Dearborn “A Proposed Model and Measurement Instrument for the Formation of IS Satisfaction: The Case of End-User Computing Satisfaction,” Wynne W. Chin, University of Houston, and Matthew K. O. Lee, City University of Hong Kong “Content Versus Structure in Information Environments: A Longitudinal Analysis of Website Preferences,” Michael J. Davern, New York University, Dov Te’eni, Bar-Ilan University, and Jae Yun Moon, New York University “Of Mice and Users,” Paul Beckman, San Francisco State University
Session M4.3 Plaza 4	Completed Research Chair Paper Discussant Paper Discussant	Economics of E-Commerce Chris Kemerer, University of Pittsburgh “Switching Cost and Brand Loyalty in Electronic Markets: Evidence from On-Line Retail Brokers,” Pei-yu Sharon Chen and Lorin M. Hitt, University of Pennsylvania Robert A. Josefek, Jr., University of Southern California “Follow the Leader? Strategic Pricing in E-Commerce,” Robert J. Kauffman and Charles A. Wood, University of Minnesota Michael Smith, Carnegie Mellon University
Session M4.4 Plaza 5	Completed Research Chair Paper Discussant Paper Discussant	Measuring Aspects of IT E. Burton Swanson, University of California, Los Angeles “Measuring IT Core Capabilities for Electronic Commerce: Results from a Confirmatory Factor Analysis,” Hans Van der Heijden, Vrije Universiteit Amsterdam Anandhi Bharadwaj, Emory University “Information Quality of Commercial Web Site Home Pages: An Exploratory Analysis,” Xiaoni Zhang, University of North Texas, Kellie B. Keeling, Virginia Tech, and Robert Pavur, University of North Texas Fred Niederman, St. Louis University
Session M4.5 Plaza 6	Panel Chair Panelists	Data Quality in Internet Time, Space, and Communities Yang W. Lee, Northeastern University Paul L. Bowen, University of Queensland James D. Funk, S. C. Johnson and the University of Wisconsin, Parkside Matthias Jarke, GMD-FIT and RWTH Aachen Stuart E. Madnick, Massachusetts Institute of Technology Yair Wand, University of British Columbia
Session M4.6 Plaza 1	Teaching Case Chair Case Discussant Case Discussant	E-Commerce in the Media Industry Graham Pervan, Curtin University “SCMP.com: Strategic Repositioning of a Newspaper,” Ali Farhoomand and Eva Kwan, University of Hong Kong Jo Coldwell, Deakin University “EIU’s ViewsWire: New Wine in a New Bottle,” Peter Lovelock and Ali Farhoomand, University of Hong Kong John Venable, Curtin University

Tuesday, December 12

7:00 a.m.–8:00 a.m. Plaza Foyer	Continental Breakfast	
8:00 a.m.–4:00 p.m. Plaza Foyer	Conference Registration	
8:00 a.m.–5:00 p.m. Plaza Ballroom	AIS/ICIS Placement	
8:00 a.m.–6:00 p.m. Plaza Foyer	Exhibits	
8:30 a.m.–10:00 a.m.		
Session T1.1 Plaza 6	Plenary Session	
	Chair:	Peter Weill, Massachusetts Institute of Technology
	Keynote	
	Address:	Steven Hibbard, CEO, Lonely Planet “IT in the Travel Information Industry: Enabler or Killer App?”
10:00 a.m.–10:30 a.m.	Break — Refreshments	
10:30 a.m.–12:00 noon		
Session T2.1 Plaza 3	Research in Progress	Virtual Teams and Technology Appropriation
	Chair	Susan Brown, Indiana University
	Paper	“Virtual Teams: Managerial Behavior Control’s Impact on Team Effectiveness,” Gabriele Piccoli, Cornell University, and Blake Ives, Louisiana State University
	Paper	“Knowledge Sharing Practices and Technology Use Norms in Dispersed Development Teams,” Deborah Sole and Lynda Applegate, Harvard Business School
	Paper	“A Qualitative Analysis of Structural Emergence and Ascendant Leadership in Technological Appropriation,” David W. Miller and John P. Bartkowski, Mississippi State University, and Wm. David Salisbury, Ohio State
Session T2.2 Plaza 2	Teaching Case	Implementing Global ERP
	Chair	Scott Schneberger, University of Western Ontario
	Case	“NIBCO’s ‘Big Bang’,” Carol Brown and Iris Vessey, Indiana University
	Discussant	Jeanne Ross, Massachusetts Institute of Technology
	Case	“Managing Global Information Strategy: Xerox Ltd.,” Philip Seltsikas, Brunel University
	Discussant	Joachim Griese, University of Berne
Session T2.3 Plaza 4	Completed Research	Neural Networks and Databases
	Chair	Sudha Ram, University of Arizona
	Paper	“Opening the Neural Network Black Box: An Algorithm for Extracting Rules from Function Approximating Artificial Neural Networks,” Rudy Setiono and Wee Kheng Leow, National University of Singapore, and James Y. L. Thong, Hong Kong University of Science and Technology
	Discussant	Olivia Sheng, University of Arizona
	Paper	“The Effects of Parallel Processing on Update Response Time in Distributed Database Design,” Jesper M. Johansson, Boston University, Salvatore T. March, Vanderbilt University, and J. David Naumann, University of Minnesota
	Discussant	Joseph Davis, University of Wollongong

Session T2.4 Plaza 5	Completed Research Chair Paper Discussant Paper Discussant	Implementation and Standardization Roberta Lamb, University of Hawaii “Framing Implementation Management,” Angela Lin, Leeds Metropolitan University, and Tony Cornford, London School of Economics and Political Science Elizabeth Davidson, University of Hawaii “Standardization: Bridging the Gap Between Economic and Social Theory,” Vladislav Fomin, University of Jyväskylä, and Thomas Keil, Helsinki University of Technology Susan Scott, London School of Economics
Session T2.5 Plaza 1	Panel Chair Panelists	The Role of IT in the Creation of Sustainable Communities David B. Paradice, Texas A&M University James F. Courtney, Jr., Texas A&M University Kalle Lyytinen, University of Jyväskylä Jaana Poora, University of Houston
Session T2.6 Plaza 6	Tutorial Chair Tutorial	Web-Based Data Collection Debbie Compeau, University of Western Ontario “Web-Based Data Collection for the Analysis of Hidden Relationships (Web Mining of Hypertext Links),” Edna Reid, Nanyang Technological University
12:00 noon–2:00 p.m. Plaza Ballroom	Lunch	Leo Awards AIS Fellows
2:00 p.m.–3:30 p.m.		
Session T3.1 Plaza 2	Research in Progress Chair Paper Paper Paper	IT Environment, Outsourcing, and Industry Impacts Michael Lawrence, University of New South Wales “External IT Environment: Dimensionality and Measurement,” C Ranganathan, Southern Illinois University, and Vijay Sethi, Nanyang Technological University “A Content-Analytic Longitudinal Study of the Drivers for Information Technology and Systems Outsourcing,” Jahyun Goo, Rajiv Kishore, and H. Raghav Rao, State University of New York, Buffalo “How Do Information and Communication Technologies Reshape Work? Evidence from the Residential Real Estate Industry,” Kevin Crowston, Syracuse University, Steve Sawyer, Pennsylvania State University, Rolf Wigand and Marcel Allbritton, Syracuse University
Session T3.2 Plaza 3	Research in Progress Chair Paper Paper Paper	Data Modeling and Knowledge Discovery Jeffrey Parsons, Memorial University of Newfoundland “Integrating Multi-Perspective Views into Ontological Analysis,” Michael Rosemann, Queensland University of Technology, and Peter Green, University of Queensland “Managing Accounting Information Quality: An Australian Study,” Hongjiang Xu, University of Southern Queensland “Knowledge Discovery for Decision Support in Law,” Andrew Stranieri and John Zeleznikow, LaTrobe University
Session T3.3 Plaza 4	Completed Research Chair Paper Discussant Paper Discussant	Research in Incomplete Contracting Vijay Gurbaxani, University of California, Irvine “Information Technology, Contract Completeness, and Buyer-Supplier Relationships,” Rajiv D. Banker, University of Texas, Dallas, Joakim Kalvenes, Southern Methodist University, and Raymond A. Patterson, University of Texas, Dallas Shankar Sundareshan, Penn State University “Economic Returns to Firms from Business-to-Business Electronic Commerce Initiatives: An Empirical Examination,” Mani Subramani and Eric Walden, University of Minnesota Shinkyu Yang, New York University

Session T3.4 Plaza 5	Completed Research	Managing in the Knowledge Economy
	Chair	Josep Valor, IESE
	Paper	“Managing Intranet Technology in an Organizational Context: Toward a ‘Stages of Growth’ Model for Balancing Empowerment and Control,” Aidan Duane, Waterford Institute of Technology, and Pat Finnegan, University College Cork
	Discussant	Ramiro Montealegre, University of Colorado, Boulder
	Paper	“Construing Corporate Diversification and the Role of Information Technology for Diversified Firms in the Knowledge Economy,” Huseyin Tanriverdi, Boston University
	Discussant	Ben Bensaou, INSEAD
Session T3.5 Plaza 1	Panel	IS Research Ethics: Defining Ethnical, Barely Ethical, and Unethical Behavior
	Chair	Ned Kock, Temple University
	Panelists	Robert Davison, City University of Hong Kong Roger Clarke, Australian National University Karen Loch, Georgia State University
Session T3.6 Plaza 6	Tutorial	Partial Least Squares for IS Researchers
	Chair	Joo Eng Lee-Partridge, National University of Singapore
	Tutorial	“Partial Least Squares for IS Researchers: An Overview and Presentation of Recent Advances Using the PLS Approach,” Wynne Chin, University of Houston
3:30 p.m.–4:00 p.m.	Break — Refreshments	
4:00 p.m.–5:30 p.m.		
Session T4.1 Plaza 1	Research in Progress	IT Value
	Chair	Young-Gul Kim, KAIST
	Paper	“The Development of Measures to Assess the Performance of the Information Systems Function: A Multiple-Constituency Approach,” Jerry Cha-Jan Chang, University of Pittsburgh/University of Nevada, Las Vegas, and William R. King, University of Pittsburgh
	Paper	“Value Assessment of IS/IT Service Provision Within Organizations,” Gurpreet Dhillon and Jongwoo Lee, University of Nevada, Las Vegas
	Paper	“The Relationship Between Psychological Ownership and IT-Driven Value,” Michel Avital and Betty Vandenbosch, Case Western Reserve University
Session T4.2 Plaza 2	Completed Research	Internet Studies
	Chair	Rick Watson, University of Georgia
	Paper	“Achieving First-Mover Advantage Through Product Customization on the Net,” Rajiv Dewan, Bing Jing, and Avi Seidman, University of Rochester
	Discussant	Ted Clark, Hong Kong University of Science and Technology
	Paper	“The Effect of Negative Buyer Feedback on Prices in Internet Auction Markets,” Zoonky Lee, University of Nebraska, Lincoln, Il Im, New Jersey Institute of Technology, and Sang Jun Lee, University of Nebraska, Lincoln
	Discussant	Fred Riggins, Georgia Technological University
Session T4.3 Plaza 3	Completed Research	Agents and Knowledge Management
	Chair	Frada Burstein, Monash University
	Paper	“Intelligent Agents for Retrieving Chinese Web Financial News,” Christopher C. Yang and Alan Chung, Chinese University of Hong Kong
	Discussant	Patrick Chau, Hong Kong University
	Paper	“A Framework of Knowledge Management Systems: Issues and Challenges for Theory and Practice,” Jungpil Hahn and Mani Subramani, University of Minnesota
	Discussant	Liz Sonenberg, University of Melbourne

Session T4.4 Plaza 4	Completed Research	Shared Systems, Shared Knowledge
	Chair Paper	Roberto Evaristo, University of Illinois, Chicago “Creative Ties and Ties That Bind: Examining the Impact of Weak Ties on Individual Performance,” Robin Teigland, Stockholm School of Economics, and Molly McLure Wasko, University of Maryland
	Discussant Paper	Carol Pollard, University of Tasmania “Supporting Shared Information Systems: Boundary Objects, Communities, and Brokering,” Suzanne D. Pawlowski, Louisiana State University, Dan Robey and Arjan Raven, Georgia State University
	Discussant	Liisa von Hellens, Griffith University
Session T4.5 Plaza 6	Debate	Does the Trend Toward E-Business Call for Changes in the Fundamental Concept of Information Systems?
	Moderator	Steven Alter, University of San Francisco
	Proponents	M. Lynne Markus, Claremont Graduate University/City University of Hong Kong Judy Scott, University of Colorado, Denver
	Opponents	Philip Ein-Dor, Tel Aviv University Iris Vessey, Indiana University
7:00 p.m. – 11:00 p.m. Plaza Ballroom	Conference Dinner	
Wednesday, December 13		
7:00 a.m.–8:00 a.m. Plaza Foyer	Continental Breakfast	
8:00 a.m.–12:00 noon Plaza Foyer	Conference Registration	
8:00 a.m.–12:00 noon Plaza Foyer	Exhibits	
8:30 a.m.–10:00 a.m.		
Session W1.1 Plaza 3	Research in Progress	Trading and Security on the Internet
	Chair Paper	Anitesh Barua, University of Texas, Austin “Is More Information Better? The Effect of Traders’ Irrational Behavior on an Artificial Stock Market,” Wei T. Yue, Alok R. Chaturvedi, and Shailendra Mehta, Purdue University
	Paper	“The Experimental Analysis of Information Security Management Issues for the Online Financial Services,” Mukul Gupta, Alok R. Chaturvedi, Sahilendra Mehta, Purdue University, and Lorenzo Valeri, King’s College London
	Paper	“Economic Mechanism Design for Securing Online Auctions,” Wenli Wang, Emory University, Zoltán Hidvégi, IBM Corporation, and Andrew B. Whinston, University of Texas, Austin
Session W1.2 Plaza 4	Completed Research	IT Diffusion and Adoption
	Chair Paper	Gunnar Christensen, Norwegian School of Economics “Adoption as Sensemaking: Toward an Adopter-Centered Process Model of IT Adoption,” Larry Seligman, University of Cincinnati
	Discussant Paper	Darren Meister, Queen’s University “The Influence of Persuasion, Training, and Experience on User Perceptions and Acceptance of IT Innovation,” Weidong Xia and Gwanhoo Lee, University of Minnesota
	Discussant	Anol Bhattacharjee, Arizona State University

Session W1.3 Plaza 5	Completed Research	ERP Systems
	Chair	Ross Jeffery, University of New South Wales
	Paper	“Game Playing Behavior in Requirements Analysis, Evaluation, and System Choice for Enterprise Resource Planning Systems,” Daniel E. O’Leary, University of Southern California
	Discussant	Gautam Ray, University of Texas, Austin
	Paper	“Enterprise Resource Planning and Organizational Knowledge: Patterns of Convergence and Divergence,” Richard Baskerville, Georgia State University, Suzanne Pawlowski, Louisiana State University, and Ephraim R. McLean, Georgia State University
	Discussant	Graeme Shanks, University of Melbourne
Session W1.4 Plaza 1	Panel	Three Perspectives: If Markus’ 1983 Classic Study, “Power, Politics and MIS Implementation,” Were Being Reviewed Today
	Chair	Allen S. Lee, Virginia Commonwealth University
	Panelists	Michael Myers, University of Auckland Guy Paré, École des Hautes Études Commerciales Cathy Urquhart, University of the Sunshine Coast
	Commentator	M. Lynne Markus, City University of Hong Kong
Session W1.5 Plaza 2	Teaching Case	Knowledge and Multimedia
	Chair	Liz Sonenberg, University of Melbourne
	Case	“Knowledge Management at Ernst & Young UK: Getting Value Through Knowledge Flows,” Jean-Noël Ezingard, Henley Management College, Simon Leigh, Ernst & Young, and Rebecca Chandler-Wilde, Henley Management College
	Discussant	Gad Ariav, Tel Aviv University
	Case	“The LEGO Interactive Teaching Case: Direct Consumer Access,” Rikke Orngreen, Copenhagen Business School
	Discussant	Chris Sauer, Oxford University
Session W1.6 Plaza 6	Completed Research	Examining the Nature and Role of IS Research
	Chair	Michael Vitale, Australian Graduate School of Management
	Paper	“Power and Information Technology: A Review Using Metatriangulation,” Carol S. Saunders, Traci A. Carte, Jon Jaspersen, Henry Croes, and Weijun Zheng, University of Oklahoma, and Brian Butler, University of Pittsburgh
	Discussant	Pamela Hinds, Stanford University
	Paper	“Building Links Between IS Research and Professional Practice: Improving the Relevance and Impact of IS Research,” Daniel L. Moody, University of Melbourne/Simson Bowles & Associates
	Discussant	Emerson Tiller, University of Texas, Austin
10:00 a.m.–10:30 a.m.	Break — Refreshments	
10:30 a.m.–12:00 noon		
Session W2.1 Plaza 1	Research in Progress	Usage and Impacts on the Internet
	Chair	Ananth Srinivasan, University of Auckland
	Paper	“Managing Customer Turnover in Online Services: A Systems Thinking Approach,” Amitava Dutta, George Mason University
	Paper	“Effects of Consumer Lifestyles on Purchasing Behavior on the Internet: A Conceptual Framework and Empirical Validation,” Dan Jong Kim, Bongsoo Cho, and H. Raghav Rao, State University of New York, Buffalo
	Paper	“Electronic Commerce: The Impact of the Internet on Sales Practices in the Car Industry,” Ulrike Schultze and Page Moreau, Southern Methodist University

Session W2.2 Plaza 3	Completed Research	Software Quality and Volatility
	Chair	Rich Wang, Boston University
	Paper	“Process Maturity and Software Quality: A Field Study,” Donald E. Harter, University of Michigan, and Sandra A. Slaughter, Carnegie Mellon University
	Discussant Paper	Vojislav Mistic, Hong Kong University of Science and Technology
	Discussant Paper	“Measuring Software Volatility: A Multi-Dimensional Approach,” Evelyn Barry and Sandra A. Slaughter, Carnegie Mellon University
	Discussant	Graham Low, University of New South Wales
Session W2.3 Plaza 2	Completed Research	ERP Implementation and Usage
	Chair	Peter Seddon, University of Melbourne
	Paper	“Using a Case Study to Test the Role of Three Key Social Enablers in ERP Implementation,” Suprateek Sarker, Washington State University, and Allen Lee, Virginia Commonwealth University
	Discussant Paper	Michael Gallivan, Georgia State University
	Discussant Paper	“Five Roles of an Information System: A Social Constructionist Approach to Analyzing the Usage of ERP Systems,” Linda Askenäs and Alf Westelius, Linköping University
	Discussant	Diane Strong, Worcester Polytechnic Institute
Session W2.4 Plaza 6	Panel	Addressing the IT Skills Crisis: Gender and the IT Profession
	Chair	Denis M. S. Lee, Suffolk University
	Panelists	Sue Nielsen, Griffith University Eileen Trauth, Northeastern University Viswanath Venkatesh, University of Maryland
Session W2.5 Plaza 4	Completed Research	Information Technology and Corporate Governance
	Chair	Cynthia Beath, University of Texas, Austin
	Paper	“Information Technology Governance by Design: Investigating Hybrid Configurations and Integration Mechanisms,” Ryan R. Peterson, Ramon O’Callaghan, and Pieter Ribbers, Tilburg University
	Discussant Paper	Anne Rouse, Monash University
	Discussant Paper	“Information Technology and Information Goods as Predictors of Organizational Expansion Activity,” Virginia Franke Kleist, West Virginia University, Irene Hanson Frieze and William R. King, University of Pittsburgh
	Discussant	Jay Coopridge, Bentley College
Session W2.6 Plaza 5	Completed Research	Strategic IT Decision Making
	Chair	Abhijit Gopal, University of Calgary
	Paper	“Assessing the Impact of Decision Process on the Effectiveness of Strategic IT Decisions: A Triangulation Approach Combining Qualitative and Quantitative Methods,” C Ranganathan, Southern Illinois University, and Vijay Sethi, Nanyang Technological University
	Discussant Paper	Tor Larsen, Norwegian School of Management
	Discussant Paper	“CIO Lateral Influence Behaviors: Gaining Peers’ Commitment to Strategic Information Systems,” Harvey G. Enns, University of Dayton, Sid L. Huff, Victoria University of Wellington, and Christopher A. Higgins, University of Western Ontario
	Discussant	Dave Chatterjee, Washington State University

End of Conference

Completed Research Papers

Session M2.2
Monday, 10:30–12:00 noon
Plaza 2

Versioning Information Goods with Network Externalities, Bing Jing, University of Rochester

Positive externalities characterize the consumption of a majority class of information goods and services such as software, e-mail, and online content and services including virtual communities. We show that network externality is critical for the market segmentation and product line decisions of an information goods seller. With externality, a monopoly of multiple existing products offers

exactly two distinct qualities. When development costs are taken into account, the low quality is developed only if the gain in revenue due to an enlarged network exceeds the extra development costs. In particular, if developed, the low quality should be offered for free under very general conditions. Network externality itself thus can explain the market provision of free information goods by proprietary sellers from a product line design perspective.

Information Complements, Substitutes, and Strategic Product Design, Geoffrey Parker, Tulane University, and Marshall W. Van Alstyne, University of Michigan

In the information economy, competitive maneuvers have raised the question of when firms can increase profits by giving away free products. Microsoft and Netscape (now part of AOL) competed by finding ever more channels through which to freely distribute their browser. Adobe widely distributes its portable document reader. Real Audio and Microsoft permit anyone to download their multimedia players. Sun Microsystems acquired Star, the most successful developer of a Linux office suite, in order to give its products away.

This paper presents an analysis and an answer to the free information question. Free strategic complements can raise profits for goods owned by the same firm. Our model predicts that firms may integrate or incur significant development costs in order to distribute portions of a pair of complements. In contrast, free strategic substitutes can lower profits for competitors inducing market exit when average cost curves are declining. Incumbents then benefit from reduced competition.

A firm can use strategic product design to penetrate a market that becomes competitive post-entry. The threat of entry is credible even in cases where the firm never recovers its sunk costs directly. In fact, a firm may use a complementary good to seek market share, not market power, and the loss from giving away free information can still be profit maximizing. This occurs if the free good either boosts sales of the firm's own complementary good or it thwarts sales of a competitor's substitute good, enough to offset losses from the investment subsidy. The key insight is that designing a separable product and under-pricing one component is a device for implementing price discrimination in markets with positive network externalities. The apparent contradiction of introducing and sustaining a product subsidy in one market resolves itself once it becomes clear how profits increase more than the subsidy cost in the other market. This undercuts the conventional wisdom that firms should seek to avoid Bertrand price competition. As in the case of the Internet browser wars, our framework illustrates how prices below marginal cost can be profit maximizing when they serve to stimulate demand across markets.

We note that the popularity of this product design strategy among information goods may in part be due to the unique properties of information. Because second-copy costs are negligible, a firm can afford to subsidize an arbitrarily large market while incurring a fixed initial investment cost. Each additional consumer of the free good costs the clever product designer nearly nothing in incremental costs. With increased consumption of information, we may expect to see increased use of the proposed product design strategy in the future. Correspondingly, this may help to explain the ubiquity of free information offered on the Internet.

Session M2.3
Monday, 10:30–12:00 noon
Plaza 4

An Approach to Intelligent Query and Component Retrieval for Web-Based Repositories, Vijayan Sugumaran, Oakland University, and Veda C. Storey, Georgia State University

With the increasing amount of commerce performed over the Internet, there has been an expansion in the creation and use of web databases. From this, two trends have emerged. First, databases are developed "from scratch," even though it is well known that the development and employment of

reusable artifacts is the most efficient way to approach the development process. Second, after a database has been developed, retrieval problems often exist, because there might be related information the user does not know about, or the user cannot express his or her requirements in natural language. The objectives for this research are (1) to develop an approach to obtaining intelligent results from a query to a web database and (2) to develop a procedure for defining and reusing domain models to assist in the development of web applications.

Personalization of Search Engine Services for Effective Retrieval and Knowledge Management, Weiguo Fan and Michael D. Gordon, University of Michigan, and Praveen Pathak, Purdue University

The Internet and corporate intranets provide far more information than anybody can absorb. People use search engines to find the information they require. However, these systems tend to use only one fixed term weighting strategy regardless of the context to which it applies, posing serious performance problems when characteristics of different users, queries, and text collections are taken into consideration. In this paper, we argue that the term weighting strategy should be context specific, that is, different term weighting

strategies should be applied to different contexts, and we propose a new systematic approach that can automatically generate term weighting strategies for different contexts based on genetic programming (GP). The new proposed framework was tested on TREC data and the results are very promising.

Session M2.4
Monday, 10:30–12:00 noon
Plaza 5

Issues in Predicting and Explaining Usage Behaviors with the Technology Acceptance Model and the Theory of Planned Behavior When Usage Is Mandatory, Patrick Rawstorne, Rohan Jayasuriya, and Peter Caputi, University of Wollongong

Within certain industries there is an increasing prevalence toward computerizing work practices and mandating specific tasks performed using an Information System (IS). This trend is unlikely to diminish the need for stakeholders, involved in the implementation of an IS, to identify the determinants of successful use. Yet, to date, there is a paucity of research that has considered the issues specific to predicting and explaining user behavior in these situations. In this paper, we identify the relevant issues necessary for applying the technology acceptance model and the theory of planned behavior to the prediction and explanation of mandated IS usage, and we assess the value of these models to the task. The results of a longitudinal study conducted in a hospital setting are presented and we suggest the direction that future research might take.

Technological Capacitation in Customer Service Work: A Sociotechnical Approach, Stephen Corea, London School of Economics

This research effort seeks to extend current understanding within the sociotechnical perspective. It investigates the inter-relationship between various aspects of both individual and technology roles in the workplace. A main focus of research is the notion of technological capacitation, the support employees derive from the use of IT systems. An analysis of survey data on the work environment of customer service representatives (CSRs) is undertaken. The study adopts a direct measure of self-assessed user performance, the customer satisfaction ability of CSRs. The findings indicate that technological capacitation is positively correlated with customer satisfaction ability. Role clarity, preparation, and supervisory support are found to be positively correlated with technological capacitation. Role conflict however, displays a negative correlation with technological capacitation. Autonomy, motivation, and influence over technology deployment are all found to be positively correlated with technological capacitation. Technology capacitation is also related positively with the user-friendliness and flexibility of technology, as well as the utility of technology performance-monitoring. However, it appears to be unrelated to independence from technology, creativity, and role involvement. The flexibility of technology and the utility of technology performance-monitoring also demonstrate positive correlations with customer satisfaction ability. Customer satisfaction ability, however, is found to be unrelated to the user-friendliness of technology. The results of this study thus highlight the coherence required between aspects of individual and technology roles for effective individual performance in the workplace.

Session M3.3
Monday, 2:00 p.m.–3:30 p.m.
Plaza 3

A Framework Analysis of the Open Source Software Development Paradigm, Joseph Feller and Brian Fitzgerald, University College Cork

Open Source Software (OSS) has become the subject of much commercial interest of late. Certainly, OSS seems to hold much promise in addressing the core issues of the software crisis, namely that of software taking too long to develop, exceeding its budget, and not working very well. Indeed, there have been several examples of significant OSS success stories—the Linux operating system, the Apache web server, the BIND domain name resolution utility, to name but a few. However, little by way of rigorous academic research on OSS has been conducted to date. In this study, a framework was derived from two previous frameworks which have been very influential in the IS field, namely that of Zachman's IS architecture (ISA) and Checkland's CATWOE framework from Soft Systems Methodology (SSM). The resulting framework is used to analyze the OSS approach in detail. The potential future of OSS research is also discussed.

Factors Affecting Information Systems Volatility, John Heales, University of Queensland

The objective of this research is to investigate the effect that various factors have on an information system's life span by understanding how the factors affect an information system's stability. The research builds on a previously developed two-stage model of information system change whereby an information system is either in a stable state of evolution in which the information system's functionality is evolving, or in a state of revolution, in which the information system is being replaced because it is not providing the functionality expected by its users.

A case study surveyed a number of systems within one organization. The aim was to test whether a relationship existed between the base value of the volatility index and certain system characteristics. Data relating to some 3,000 user change requests covering 40 systems over a 10-year period were obtained. The following factors were hypothesized to have significant associations with the base value of the volatility index: semantic relativism (generation of language of construction), system size, system age, and the timing of changes applied to a system. Significant associations were found in the hypothesized directions except the timing of user changes was not associated with any change in the value of the volatility index.

Session M3.5
Monday, 2:00 p.m.–3:30 p.m.
Plaza 4

Toward Social Constructivist Understandings of IS Success and Failure: Introducing a New Computerized Reservation System, Nathalie Mitev, London School of Economics

This article is based on an intensive case study, the implementation of a computerized reservation system (CRS) in a transport organization, and adopts a non-essentialist stance to analyze its failure aspects. Providing a rich description of micro-level, organizational, and macro-level events

and techno-economic networks enabled us to depart from managerialist and technologist accounts of the failure. The analysis draws on constructivism and the sociology of technology, more specifically actor-network theory and the notions of symmetry and translation. An effort is made to combine elements of both the global and the local in identifying a series of translations occurring in the case study. To complement actor-network theory, a critical analysis is also necessary to examine how power relationships are creating disadvantage and can further explain failure.

The Politics of IS Evaluation: A Social Shaping Perspective, Melanie Wilson, University of Manchester Institute of Science and Technology, and Debra Howcroft, University of Salford

A considerable amount of research has already been conducted in the IT/IS evaluation arena, yet rewards remain elusive. This has been variously explained and in this paper we aim to realize two objectives: first, to examine some particular political and social aspects of evaluation processes in organizations and, second, to show the potential contribution of a social shaping approach to information systems research. A social shaping approach is attractive because it emphasizes a view of technological development as a social process as well as providing a framework for understanding the context in which technologies are displaced. Social shaping approaches encourage a concentration on the social and political processes through which terms such as failure, disaster, benefits, or successes come to be ascribed to technological systems. By highlighting the subjective element of evaluation procedures that produce such terms, we hope to contribute to the evaluation literature. A case study approach is used to illustrate the process and role of IS evaluations and emphasizes the dual exercise of evaluations for the purpose of user enrolment and to justify decisions in hindsight.

Session M3.6
Monday, 2:00 p.m.–3:30 p.m.
Plaza 5

Computer-Supported Negotiations: An Experimental Study of Bargaining in Electronic Commerce, Khim-Yong Goh, University of Chicago, Hock-Hai Teo, Haixin Wu, and Kwok-Kei Wei, National University of Singapore

The expanding business-to-business (B2B) e-commerce market has created a need for firms to negotiate business deals online. Negotiation support tools are likely to play a more critical role in B2B e-commerce. Notwithstanding their importance, the impacts of negotiation support tools (especially automated bargaining agents) are not well understood. This research addresses this gap by conducting a series of laboratory experiments to investigate the impact of web-based electronic messaging, web-based negotiation support systems (NSS), and autonomous electronic bargaining agents (EBA) on the outcomes of a multi-issue, e-commerce negotiation. Two types of bargaining situation were investigated: integrative and distributive bargaining. Negotiation outcomes were assessed using joint profit/utility outcome, contract balance, and the closeness to the efficient/Pareto frontier and the Nash bargaining solution. Findings show that web-based NSS can significantly improve efficiency and fairness in remote integrative negotiations but not in distributive negotiations. EBA were found to achieve outcomes comparable to but not significantly better than unassisted human dyads. Implications for NSS and EBA implementation and research were drawn.

Using Electronic Media for Information Sharing Activities: A Replication and Extension, D. Sandy Staples, Queen's University, and Sirkka L. Jarvenpaa, University of Texas, Austin

This article reports a replication and extension of a study that explored individual perceptions of factors that underlie the use of electronic media (electronic mail, world-wide-web, list serves, and other collaborative systems). The original study was conducted in a single Australian university. The study was replicated in a Canadian university. The replication allowed testing of the enlarged research model that involves organizational culture variables as well as attitudes toward information policies. Overall, the expanded research model includes culture variables, task and technology related variables, as well as individual attitudes and beliefs. We found that task and technology related variables explained more of the use of electronic media for sharing than culture related variables or the individual attitudes and beliefs. Specifically, task interdependence, perceived information usefulness and the user's computer comfort were most strongly associated with the person's use of electronic media. Two dimensions, employee orientation and need for achievement, of organizational culture had a significant influence on the use of electronic media for information sharing activities although less strongly than the task and technology related variables. Of the individual attitudes and beliefs, attitudes about information policies had a significant influence on the use of electronic media for information sharing activities. Besides the value of replication of a research model in another culture, the study contributed to the information systems literature by developing initial scales for two new constructs: attitudes about information policies and information culture.

Session M4.3
Monday, 4:00 p.m.–5:30 p.m.
Plaza 4

Switching Cost and Brand Loyalty in Electronic Markets: Evidence from On-Line Retail Brokers, Pei-Yu Sharon Chen and Lorin M. Hitt, University of Pennsylvania

The ability to retain and lock-in customers in the face of competition is a major concern for e-commerce businesses. If a firm is able to build a significant amount of switching cost and brand loyalty, then it can benefit from a long-term flow of profits and recover investments in customer acquisition. In this paper, we propose a method to measure the magnitude of switching costs for on-line service providers, which we apply to the on-line brokerage industry. We find a significant variation in calculated switching costs between brokers—on the factor of 2—suggesting that brokers have substantial influence over their switching costs.

Follow the Leader? Strategic Pricing in E-Commerce, Robert J. Kauffman and Charles A. Wood, University of Minnesota

Conventional wisdom and current research (e.g., Bakos 1997) suggest that the Internet will lower *electronic commerce* (EC) product prices by causing intense competition among EC firms. Surprisingly, the predicted intense competition has not materialized. Sager and Green (1998) ask, “So where are all the bargains?” and note that EC firms *match*, (not *beat*), competitors’ prices. Firms retrieve competitors’ prices using the same EC *shopbot* technology that allows buyers to search for the best prices (Varian 2000). Thus, *information asymmetry* among EC firms is reduced, opening a new spectrum of competitive possibilities.

We examine the dynamics of EC product pricing using research from information systems (IS) (Bakos 1997; Brynjolfsson and Smith 1999), marketing (Alba et al. 1997; Bailey 1998; Lal and Sarvary 1999) and economics (Varian 2000) as a base. We conduct a multi-industry investigation of pricing behavior using a customized data-collecting Internet agent called *Time Series Agent Retriever* (TSAR). *Information asymmetry* and *tacit collusion* theories show how EC technology increases firms’ ability to tacitly collude. Our results, analyzed using an econometric technique called *vector autoregression* (VAR) (Sims 1980, 1986), show that EC technology reduces *information asymmetry* among EC firms and allows rapid competitor response, allowing firms to avoid competition.

We address the following research questions:

- How can researchers empirically evaluate pricing strategy for EC firms with micro-level data from the Internet?
- What are the effects of reduced information asymmetry between EC firms on the price a consumer pays for goods? What factors can determine pricing strategies?
- What empirical evidence, if any, exists to indicate that EC firms are tacitly colluding on prices?

EC firms utilize pricing strategies that heretofore were infeasible. We develop and test a model of EC price competition for *different classes of identical goods* across *firms* and *industries* and find that EC technology increases firms’ price responsiveness, but that pricing strategy is based on more than just competitor evaluation.

Session M4.4
Monday, 4:00 p.m.–5:30 p.m.
Plaza 5

Measuring IT Core Capabilities for Electronic Commerce: Results from a Confirmatory Factor Analysis, Hans van der Heijden, Vrije Universiteit Amsterdam

This paper reports on the theoretical development and empirical validation of a measurement instrument for three IT core capabilities in an electronic commerce context. The instrument is based on the work of Feeny and Willcocks and includes the capabilities “IS/IT governance,” “business system thinking,” and “relationship building.” It was validated using a sample consisting of 179 respondents, all IT managers or CIOs. Results demonstrate that the constructs are reliable (alpha coefficients > 0.8) and valid. A confirmatory factor analysis on the data set yields a moderately acceptable model fit. The model also demonstrates highly significant factor loadings ($p < 0.001$). We show that a respecification of a competing model in which “IS/IT governance” is split into “business IT strategic thinking” and “IT management” provides better measures of fit. The paper concludes that core capabilities of IT departments are useful constructs to incorporate in future research. They are able to successfully predict behaviors that have relatively little overlap. Recommended further research includes the relationship between capabilities and governance structures, as well as further investigation into how IT core capabilities are formed and strengthened in organizations.

Information Quality of Commercial Web Site Home Pages: An Explorative Analysis, Xiaoni Zhang, University of North Texas, Kellie B. Keeling, Virginia Tech, and Robert J. Pavur, University of North Texas

In the search for substantive relationships in the use of emerging technology, information quality is often difficult to assess. This research explores user perceptions of presentation, navigation, and quality of Web home pages for approximately 200 selected Fortune 500 companies across 10 industries. An instrument is developed to measure these constructs and is assessed for convergent and discriminant validity as well as reliability. Company Web home pages are clustered using 24 Web site features. Interpretations of the type of Web home page within a cluster are based on their characteristics. An explorative analysis is performed between types of Web home pages and user perceptions of these sites. This study provides empirical evidence of relationships between companies at different positions in the supply chain and the information quality of their Web home pages.

Session T2.3
Tuesday, 10:30 a.m.–12:00 noon
Plaza 4

Opening the Neural Network Black Box: An Algorithm for Extracting Rules from Function Approximating Artificial Neural Networks, Rudy Setiono and Wee Kheng Leow, National University of Singapore, and James Y. L. Thong, Hong Kong University of Science and Technology

Artificial neural networks have been successfully applied to solve a variety of business applications involving classification and function approximation. In many such applications, it is desirable to extract knowledge from trained neural networks so that the users can gain a better understanding of the solution. Existing research has focused primarily on extracting symbolic rules for classification problems with few methods devised for function approximation problems. In order to fill this gap, we propose an approach to extract rules from neural networks that have been trained to solve function approximation problems. The extracted rules divide the data samples into groups. For all samples within a group, a linear function of the relevant input attributes of the data approximates the network output. Experimental results show that the proposed approach generates rules that are more accurate than the existing methods based on decision trees and regression.

The Effects of Parallel Processing on Update Response Time in Distributed Database Design, Jesper M. Johansson, Boston University, Salvatore T. March, Vanderbilt University, and J. David Naumann, University of Minnesota

Network latency and local update are the most significant components of update response time in a distributed database system. Effectively designed distributed database systems can take advantage of parallel processing to minimize this time. We present a design approach to response time minimization for update transactions in a distributed database. Response time is calculated as the sum of local processing and communication, including transmit time, queuing delays, and network latency. We demonstrate that parallelism has significant impacts on the efficiency of data allocation strategies in the design of high transaction-volume distributed databases.

Session T2.4
Tuesday, 10:30 a.m.–12:00 noon
Plaza 5

Framing Implementation Management, Angela Lin, Leeds Metropolitan University, and Tony Cornford, London School of Economics and Political Science

The research reported in this paper explores IS implementation in the early stages of a project as a process of social translation of ideas about technology. The research employs a technological frames analysis to examine how human agents translate public or global accounts into things that they are familiar with and are of interest, filter out alternative meanings, and engage in social interaction in order to pursue their images of a technology coming into use. The paper is based on a case study of the early stages of a new e-mail system in an international banking institution. The findings of the case study suggest that a translation process, which takes place at both the individual and the organizational level at the initial stage of an IS project, can have significant consequences for the overall implementation process.

Standardization: Bridging the Gap Between Economic and Social Theory, Vladislav Fomin, University of Jyväskylä, and Thomas Keil, Helsinki University of Technology

This article examines the dynamics of inter- and intra-firm networks in technical standard setting initiatives, and how complex social networks align in these initiatives. Specifically, we argue that in standardization, complex economic and social interactions are blended. In standardization activities, firm behavior and the behavior of individuals within firms is best explained through an integration of social, political, and economic perspectives. In this article we use two main bodies of theory. First, we draw on the economic literature on standard setting and alliance formation. Second we use social network theory to complement economic arguments. In this paper we integrate streams of literature on the creation and diffusion of technical standards from industrial organization economics, strategic management, and innovation economics with recent literature concerning the social construction of technology in order to analyze the process of standard setting.

We develop our arguments with the help of three in-depth case studies of standardization initiatives in the telecommunications industry. Two case studies are in the realm of telecommunications infrastructure. The third case study analyzes the standardization of a wireless data link. The cases can be characterized as examples of the successful creation of both *de facto* and *de jure* standards.

Session T3.3
Tuesday, 2:00 p.m.–3:30 p.m.
Plaza 4

Information Technology, Contract Completeness, and Buyer-Supplier Relationships, Rajiv D. Banker, University of Texas, Dallas, Joakim Kalvenes, Southern Methodist University, and Raymond A. Patterson, University of Texas, Dallas

The theory of incomplete contracts has been used to study the relationship between buyers and suppliers following the deployment of modern information technology to facilitate coordination between them. Previous research has sought to explain anecdotal evidence from some industries on the recent reduction in the number of suppliers selected to do business with buyers, by appealing to relationship-specific costs that suppliers may incur. In contrast, this paper emphasizes the fact that information technology enables greater completeness of buyer-supplier contracts through more economical monitoring of additional dimensions of supplier performance. The number of terms included in the contract is an imperfect substitute for the number of suppliers. Based on this result, alternative conditions are identified under which increased use of

information technology leads to a reduction in the number of suppliers without invoking relationship-specific costs. Conditions are also identified when increased use of information technology leads to an increase in the number of suppliers.

Economic Returns to Firms from Business-to-Business Electronic Commerce Initiatives: An Empirical Examination, Mani Subramani and Eric Walden, University of Minnesota

Do firms derive economic returns from business-to-business (B2B) initiatives? How do returns to startup firms compare to those for established firms in B2B initiatives? How do returns to B2B initiatives around digital goods compare to those involving tangible goods? We offer a rigorous definition of B2B then conduct an empirical test of incomplete contract theory to examine the returns to B2B electronic commerce (EC) initiatives focused on digital goods versus tangible goods, and the returns to Internet firms versus brick-and-mortar firms. While there seems to be little difference between digital and tangible initiatives, we find that the returns to Internet firms are significant while the returns to brick-and-mortar firms are not. We propose, based on the application of incomplete contract theory, that this result obtains because the addition of new partners in the EC channel undermines existing relationships in the conventional channel. At the same time, existing relationships in the conventional channel undermine the quality of new relationships in the EC channel. However, Internet firms, with their single channel focus, avoid this difficulty and thus experience significant returns from B2B EC initiatives.

Session T3.4
Tuesday, 2:00 p.m.–3:30 p.m.
Plaza 5

Managing Intranet Technology in an Organizational Context: Toward a “Stages of Growth” Model for Balancing Empowerment and Control, Aidan Duane, Waterford Institute of Technology, and Pat Finnegan, University College Cork

A key aspect of managing modern organizations is the use of intranet technology as a fundamental element of IS infrastructures. An intranet is reported to increase in sophistication and in complexity as it evolves. This evolution of application leads to an increasing need for control over intranet use, development, and management. However, this is a rather contentious issue, as an intranet is deemed to be an empowering technology. Consequently, intranet related management control and empowerment activities must be balanced so as not to negate each other. However, there is a lack of research on the management of an intranet throughout its evolution in a manner that balances control and empowerment. This paper investigates intranet related management control activities and their effect on users' perceptions of empowerment throughout the evolution of an intranet in Hewlett Packard (Ireland). The growth of the intranet is charted as a six-stage model that illustrates an evolution of purpose, control, and empowerment. The control strategies implemented at each stage are investigated, and their success in managing intranet growth and empowerment evaluated. Overall, the study reveals the importance of balancing control strategies with empowerment initiatives in managing intranet environments. Based on the evidence available, the study recommends specific management controls at particular stages in the evolution of an intranet.

Construing Corporate Diversification and the Role of Information Technology for Diversified Firms in the Knowledge Economy, Huseyin Tanriverdi, Boston University

Traditional approaches to corporate diversification are inadequate for understanding the role of corporation and strategy in the knowledge economy. This paper discusses (1) the need to construe corporate diversification in terms of knowledge-based relatedness and knowledge management capabilities of firms and (2) the role of IT for diversified firms. Knowledge-based relatedness captures relatedness of the most strategic knowledge resources—product, customer, managerial, and IT knowledge resources—residing across businesses of the firm whereas knowledge management capability captures the ability of the firm to create, transfer, integrate, and leverage knowledge across its businesses. While knowledge-based relatedness provides a potential for performance through knowledge-based synergies, knowledge-management capability converts this potential into actual performance. IT knowledge relatedness is key to both creation and realization of knowledge-based synergies across the diversified firm.

Session T4.2
Tuesday, 4:00 p.m.–5:30 p.m.
Plaza 2

Achieving First-Mover Advantage Through Product Customization on the Internet, Rajiv Dewan, Bing Jing, and Abraham Seidmann, University of Rochester

The Internet provides an unprecedented capability for sellers to learn about their customers and offer custom products at special prices. Advanced manufacturing technologies have improved sellers' manufacturing flexibility. To examine how these advances affect sellers' products and pricing, we first develop a model of product customization and flexible pricing to incorporate the salient roles of the Internet and flexible manufacturing technologies in reducing the costs of designing and producing tailored consumer goods.

Simultaneous adoption of customization in a duopoly will lead to reduced product differentiation but will not facilitate the price competition between their standard products. Consumer surplus improves after sellers adopt customization but does not always increase as technologies advance. When firms face a fixed entry cost and adopt customization sequentially, the first entrant always achieves a profit advantage and may even deter the entry of the second entrant by choosing his customization scope strategically.

The Effect of Negative Buyer Feedback on Prices in Internet Auction Markets, Zoonky Lee, University of Nebraska, Lincoln, Il Im, New Jersey Institute of Technology, and Sang Jun Lee, University of Nebraska, Lincoln

The success of the Internet economy depends largely on how parties establish trust in their transactions. Building on the premise that the major role of Internet intermediaries is to ensure efficient and safe transactions between buyers and sellers, this study tested how buyer's feedback scores on sellers accumulated from previous transactions affect the final bidding prices in the electronic auction market.

The findings from this study are important as we move to more cyberspace-based transactions. First, the result tells us that feedback scores from buyers in the Internet auction market can be, like brand of products, an important factor in determining prices. Second, our results show that the effect of buyers' feedback varies depending on the product's inherent risk. This implies that the trust building mechanisms (feedback system) for different types of products may have to be designed differently. For example, the feedback systems for mass-production goods and customized goods may need to be designed differently to be more effective. Third, the non-linear relationship between the percentage of negative feedback and trust shown in our study also suggests a modification in keeping and managing the current feedback system. It seems that the number of negative feedback scores is more salient information to buyers than the percentage. Intermediaries who are responsible for providing objective and accurate information about sellers to buyers may need to delete some number of negative feedback scores when a seller reaches a certain level (either after a certain period or after a certain number of consecutive positive feedback scores).

Session T4.3
Tuesday, 4:00 p.m.–5:30 p.m.
Plaza 3

Intelligent Agents for Retrieving Chinese Web Financial News, Christopher C. Yang and Alan Chung, The Chinese University of Hong Kong

As the popularity of World Wide Web increases, many newspapers expand their services by providing news information on the Web in order to be competitive and increase benefit. The Web provides real time dissemination of financial news to investors. However, most investors find it difficult to search for the financial information of interest from the huge Web information space. Most of the commercial search engines are not user friendly and do not provide any tailor-made intelligent agents to search for relevant Web documents on behalf of users. Users have to exert a lot of effort to submit an appropriate query to obtain the information they want. Intelligent agents that learn user preferences and monitor the postings of Web information providers are desired. In this paper, we present an intelligent agent that utilizes user profiles and user feedback to search for the Chinese Web financial news articles on behalf of users. A Chinese indexing component is developed to index the continuously fetched Chinese financial news articles. User profiles capture the basic knowledge of user preferences based on the sources of news articles, the regions of the news reported, categories of industries related, the listed companies, and user specified keywords. User feedback captures the semantics of the user rated news articles. The search engine will rank the top 20 news articles that users are most interested in based on these inputs. Experiments were conducted to measure the performance of the agents based on the inputs from user profile and user feedback.

A Framework of Knowledge Management Systems: Issues and Challenges for Theory and Practice, Junpil Hahn and Mani R. Subramani, University of Minnesota

As the basis of value creation increasingly depends on the leverage of the intangible assets of firms, knowledge management systems (KMS) are emerging as powerful sources of competitive advantage. However, the general recognition of the importance of such systems seems to be accompanied by a technology-induced drive to implement systems with inadequate consideration of the fundamental knowledge problems that the KMS are likely to solve. This paper contributes to the stream of research on knowledge management systems by proposing an inductively developed framework for this important class of information systems, classifying KMS based on the locus of the knowledge and the *a priori* structuring of contents. This framework provides a means to explore issues related to KMS and unifying dimensions underlying different types of KMS. The contingencies that we discuss—the size and diversity of networks, the maintenance of knowledge flows and the long term effects of the use of KMS—provide a window into work in a number of reference disciplines that would enrich the utility of KMS and also open up fruitful areas for future research.

Session T4.4
Tuesday, 4:00 p.m.–5:30 p.m.
Plaza 4

Creative Ties and Ties That Bind: Examining the Impact of Weak Ties on Individual Performance, Robin Teigland, Stockholm School of Economics, and Molly McLure Wasko, University of Maryland

This paper examines whether the information sources used by knowledge workers have an impact on individual performance and creativity. Although it is widely recognized that new knowledge is created through the combination and exchange of existing knowledge, there is a large variety of knowledge sources available to individuals. In this study, we examine whether individual performance varies as a result of (1) individual factors, (2) usage of a variety of information sources, (3) reliance on colocated colleagues, or (4) participation in an organizational electronic community. Results indicate that experience and education predict general performance, regardless of the type of information sources used. However, the type of information sources used by individuals relates significantly to creativity. Reliance on colocated colleagues results in less creativity while participation in an electronic community leads to higher creativity. Additional analysis reveals that participation in the electronic community does not have a direct effect on creativity, rather participation has a direct impact on the acquisition of new knowledge, which in turn influences creativity. Group tenure and type of participation (posting questions vs. responses) are also

important predictors whose effects are fully mediated through knowledge acquisition. Finally, professional commitment did not contribute to knowledge exchange in the electronic community, rather professional commitment had a direct effect on creativity.

Supporting Shared Information Systems: Boundary Objects, Communities, and Brokering, Suzanne D. Pawlowski, Louisiana State University, and Dan Robey and Arjan Raven, Georgia State University

Organizations increasingly rely upon integrated and shared information systems and databases such as ERP systems and data warehouses. Such shared systems pose new and unique support challenges for systems professionals. A review of the literature reveals that comprehensive models to study the support of shared information systems do not yet exist. Based on the theory of communities of practice, and on the concepts of convergence and divergence of systems and practice, the boundary object brokering model of shared information systems is developed. This model is applied to an interpretive case study of a large company, illustrating how shared systems can be seen as boundary objects that connect disparate communities of practice. The model and case study show how the traditional role of systems professionals has been augmented to include brokering tasks, providing new issues and implications for theory and practice.

Session W1.2
Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 4

Adoption as Sensemaking: Toward an Adopter-Centered Process Model of IT Adoption, Larry Seligman, University of Cincinnati

Current technology adoption research focuses on relationships between attitudes, intentions, behavior, and their various antecedents, but little is known about how these relationships develop and the processes by which adoption actually takes place. Karl Weick's model of sensemaking in organizations is presented as a basic model for understanding adoption attitudes and behavior from an adopter-centered, process-oriented perspective. This perspective provides the opportunity for a much richer understanding of how adoption occurs and how it can be influenced. Seven properties of sensemaking are discussed in terms of adoption, the sensemaking model is compared to Rogers' innovation-decision process model, and many research questions are mentioned to guide future process-oriented adoption research.

The Influence of Persuasion, Training, and Experience on User Perceptions and Acceptance of IT Innovation, Weidong Xia and Gwanhoo Lee, University of Minnesota

Information technology (IT) cannot produce any positive outcome unless it is adopted and used. Theories and empirical research suggest that IT adoption and usage are determined by user beliefs and attitudes toward IT. However, little is known about what factors affect the formation and change over time of user beliefs and attitudes. It is critical to understand such factors so that effective managerial interventions can be created and implemented to positively influence user acceptance and use of IT innovations.

Based on theories of innovation diffusion, information technology adoption, and persuasion, this study investigates the effect of persuasion, training, and direct-use experience on the formation and change over time of user perceptions and adoption decisions of IT innovation. The results of a longitudinal experimental study show that persuasion significantly affects the formation of users' initial perceptions, attitude toward, and intention to adopt IT. Training provided in the introduction stage of IT innovation helps the user form a more realistic expectation. As users' direct-use experience with IT innovation increases over time, their perceptions and adoption intentions change substantially. The results suggest that persuasion, training, and direct-use experience are important variables that need to be considered in IT innovation and adoption research and practice.

Session W1.3
Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 5

Game Playing Behavior in Requirements Analysis, Evaluation, and System Choice for Enterprise Resource Planning Systems, Daniel E. O'Leary, University of Southern California

Historically, using legacy software, each major branch of a company could have their own system that met their particular needs. Unlike legacy software, enterprise resource planning (ERP) software requires that the same software be implemented in each branch or office. As a result, now branches must somehow come to agreement on software choices. A number of firms have employed ranking mechanisms where branches or their representatives effectively vote, via their rankings, to determine which software is used. Unfortunately, this can mean the introduction of gaming behavior as branches try to get the software that they think best meets their particular needs. The purpose of this paper is to review some of that gaming behavior and investigate the impact of those behaviors in the ERP requirements analysis process, ERP evaluation process, and with ERP system choice, based in the context of three real world cases.

Enterprise Resource Planning and Organizational Knowledge: Patterns of Convergence and Divergence, Richard Baskerville, Georgia State University, Suzanne Pawlowski, Louisiana State University, and Ephraim McLean, Georgia State University

This paper describes a qualitative research project involving a case study that was analyzed using grounded theory and cognitive mapping. It contributes to a theory that describes the impact of enterprise resource planning (ERP) on organizational knowledge. ERP systems produce effects that make business knowledge become more focused or "convergent" from the perspective of the organization

and more wide-ranging or “divergent” from the perspective of the individual. Other important effects include changes to the organization’s core competencies and changes in the risk profile regarding the loss of organizational knowledge.

Session W1.6
Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 6

Power and Information Technology: A Review Using Metatriangulation, Carol S. Saunders, Traci A. Carte, Jon Jasperson, Henry Croes, and Weijun Zheng, University of Oklahoma, and Brian S. Butler, University of Pittsburgh

This study uses a metatriangulation theory building process to explore the relationships between power and information technology (IT) in a sample of 43 articles from 10 leading management and MIS journals. We explore the multiple paradigms underlying this research, describe patterns emerging from the previous power and IT studies, and recommend future directions for investigation.

Building Links Between IS Research and Professional Practice: Improving the Relevance and Impact of IS Research, Daniel L. Moody, University of Melbourne/Simson Bowles & Associates

There has been a great deal of debate about the status of information systems (IS) as an academic discipline, its progress, and continued survival. Most of these critiques have been rather inward-looking, and have focused either on research methodology or the need to develop theoretical foundations. This paper argues that as an applied discipline, IS will not achieve legitimacy by the rigor of its methods or by its theoretical base, but by being practically useful. Its success will be measured by its contribution to the IS profession, and ultimately to society. We argue that to be effective, research must be both (1) relevant to the needs of practice and (2) disseminated and used by practitioners. We use medicine, a discipline which has a high level of integration between research and practice, as a model for radically changing IS research so that it can become more relevant and have a genuine impact in practice.

Session W2.2
Wednesday, 10:30 a.m.–12:00 noon
Plaza 3

Process Maturity and Software Quality: A Field Study, Donald E. Harter, University of Michigan, and Sandra A. Slaughter, Carnegie Mellon University

Quality has emerged as a key issue in the development and deployment of software products. As software products play an increasingly critical role in supporting strategic business initiatives, it is important that these products function correctly and according to users’ specifications. The costs of poor software quality (in terms of reduced productivity, downtime, customer dissatisfaction, and injury) can be enormous. For example, the Help Desk Institute, an industry group based in Denver, estimates that in 1999, Americans spent 65 million minutes on “hold” waiting for help from software vendors in debugging software problems.

This study has been designed to address the following question that is central to these issues: *What is the relationship between process maturity and software quality over the product life cycle?* We develop a conceptual framework for assessing the relationship between process maturity and software quality at different stages of the product life cycle: development, implementation, and production. Our models are empirically evaluated using archival data collected on software products developed over 12 years by the systems integration division of an information technology company. Based upon our analysis, we identify the direct and indirect marginal effects of improved process maturity on software quality at the different stages of the software life cycle. Our results also provide insight into the question of whether quality is a persistent characteristic of software products, i.e., is quality designed into or tested into software products. We conclude by discussing the contributions of our work and the implications of our findings for software quality research and practice.

Measuring Software Volatility: A Multi-Dimensional Approach, Evelyn Barry and Sandra A. Slaughter, Carnegie Mellon University

The only thing constant is change. This is certainly more true of software systems than almost any phenomenon. Not all software systems change in the same way or at the same rate. Some constantly undergo major modifications and others remain untouched for years at a time. Identification and understanding of these differences in dynamic software system behavior (i.e., *software evolution*) can improve software engineering and systems management. Measurement is key to understanding any phenomenon. Software volatility, a characteristic of software behavior, describes the changeable nature of software. By rigorously defining, evaluating, and validating a measure of software volatility, we can expand our understanding of the evolutionary processes constantly transforming software systems.

By defining software volatility measures this work provides researchers with objective metrics to investigate software evolution. Viewing software volatility as a system-level attribute and developing a multi-dimensional picture of this activity provides a direct measure of software behavior. Rigorous evaluation and validation of these measures establishes their credibility and lays the groundwork for theory building. The longitudinal application of these measures gives researchers a more complete picture of the dynamic nature of software lifecycle behavior.

Session W2.3
Wednesday, 10:30 a.m.–12:00 noon
Plaza 2

Using a Case Study to Test the Role of Three Key Social Enablers in ERP Implementation, Suprateek Sarker, Washington State University, and Allen S. Lee, Virginia Commonwealth University

The literature indicates that three key social enablers—strong and committed leadership, open and honest communication, and a balanced and empowered implementation team—are necessary conditions/precursors for successful ERP implementation. In a longitudinal positivist case study, we find that, while all three enablers may contribute to ERP implementation success, only strong and committed leadership can be empirically established as a necessary condition. This presents a challenge to future ERP researchers for resolving apparent contradictions between the existing literature and the results of our analysis, and for investigating the nature of interactions among the leadership, communication, and team characteristics.

Five Roles of an Information System: A Social Constructionist Approach to Analyzing the Use of ERP Systems, Linda Askenäs and Alf Westelius, Linköping University

This paper presents a novel way of thinking about how information systems are used in organizations. Traditionally, computerized information systems are viewed as objects. In contrast, by viewing the information system as an actor, our understanding of the structuration process increases. The user, being influenced by the ERP (Enterprise Resource Planning) system and giving it an actor role, thereby also confers agency on the ERP system. Through its very use, it influences actions and thus the structure as well. Based on a case study of ERP use in an ABB company for over a decade, five different roles played by the ERP system were identified. The ERP system acted as Bureaucrat, Manipulator, Administrator, Consultant or was dismissed (Dismissed) in the sense that intended users chose to avoid using them.

The purpose of this approach is not to “animate” the information system, to give it life or a mind of its own, but rather to make explicit the socially constructed roles conferred on the information system by users and others who are affected by it. On this basis, it is possible to suggest how the roles can help us open up new areas of exploration concerning the fruitful use of information technology.

Session W2.6
Wednesday, 10:30 a.m.–12:00 noon
Plaza 4

Information Technology Governance by Design: Investigating Hybrid Configurations and Integration Mechanisms, Ryan R. Peterson, Ramon O’Callaghan, and Pieter M. A. Ribbers, Tilburg University

This study aims to enrich and expand the conceptualization of IT governance by identifying the diversity of hybrid configurations and integration mechanisms and exploring the IT performance effects. While literature describes the prevailing configurations for formally allocating IT decision-making authority, previous studies have not addressed the complexity of hybrid configurations, the required integration mechanisms, and the associated performance effects. Building forth on organization theory, a conceptual framework is developed for conducting multiple comparative case study research in the financial services industry. The findings indicate that as companies experience increased uncertainty and complexity, and adopt multi-focused strategies, IT governance designs are more hybrid with increased coordination needs. A federal configuration for IT governance by itself is not related to improved IT performance. IT performance effectiveness is associated with both hybrid configuration and complex integration mechanisms. The implications for research and practice are discussed.

Information Technology and Information Goods as Predictors of Organizational Expansion Activity, Virginia Franke Kleist, West Virginia University, Irene Hanson Frieze and William R. King, University of Pittsburgh

This research presents a model that separates the effects of the use of information technology (IT) in the production and distribution of goods from the degree of information in the product on changes in vertical and horizontal firm boundaries. The research tests and confirms the hypothesis that firms that produce higher levels of information goods tend to have different vertical and horizontal organizational boundaries when compared to non-information goods firms. Information goods producing firms may be subject to unusual economies of scale, scope, network externalities, and increasing returns effects. These effects are drivers for horizontal firm boundary expansion. Further, the research partially tests the electronic markets hypothesis, which argues that information technology influences the dismantling of extensive vertical firm boundaries by lowering firm transactions costs, finding some supportive results. The research also tests for the hypothesized effect of information technology use in enabling expanding horizontal firm boundaries. Chi square and MANOVA analyses, using two years of merger, acquisition and alliance event data on a sample of 317 very large firms were conducted, while controlling for firm revenues. The results suggest that information goods producing firms have structures that are driven by the unique economics of manufacturing and marketing information products, as well as the transactional and agency effects of information technology used in production.

Session W2.6
Wednesday, 10:30 a.m.–12:00 noon
Plaza 5

Assessing the Impact of Decision Process on Effectiveness of Strategic IT Decisions: A Triangulation Approach, C Ranganathan, Southern Illinois University, and Vijay Sethi, Nanyang Technological University

Research on strategic information systems planning (SISP) has been characterized by a heavy emphasis on normative models for IT strategy formulation. Numerous approaches to formulating strategic plans and for designing IT planning systems have been suggested in the literature. Despite this, evidence from empirical studies indicates that IT executives have a great deal of trouble in translating plans into actions and specific decisions. Hence, our knowledge on IT planning needs to be supplemented with an understanding of strategic IT decisions and the processes underlying them.

Strategic IT decisions are those fundamental decisions that shape the IT strategy of an organization. While there has been considerable research on issues pertaining to formulating and implementing IT strategy, research on strategic IT decisions has received relatively limited attention. Addressing this gap, this study focuses on the process and effectiveness of strategic IT decisions. We define strategic IT decision as an IT-related decision whose intended impact is perceived as crucial to the organization. The dynamics of strategic IT decision process are investigated using two constructs, namely *rationality* and *politics*. Rationality in decision making refers to the extent to which the decision process involves gathering of information relevant to the decision and the reliance upon the analysis of this information in making the final choice. Politics are the observable, but covert, actions performed by executives within an organization or by agencies external to the organization in order to influence a decision.

Our study is guided by two key research questions. First, *to what extent does rationality in strategic IT decision process impact the decision effectiveness?* Second, what impact does political behavior in strategic IT decision process have on the decision effectiveness?

CIO Lateral Influence Behaviors: Gaining Peers' Commitment to Strategic Information Systems, Harvey G. Enns, University of Dayton, Sid L. Huff, Victoria University of Wellington, and Christopher A. Higgins, University of Western Ontario

In order to develop and bring to fruition strategic IT initiatives, Chief Information Officers (CIOs) must be able to effectively influence their peers. However, little is known about how this is accomplished. Accordingly, this research examines the relationship between CIO influence behaviors and successful influence outcomes. Focused interviews were first conducted with CIOs and their peers so as to gain insights into the phenomenon and to refine a research model. Then a survey instrument was developed and distributed to CIOs and their peers to gather data with which to test the research model. The findings showed that rational persuasion and personal appeal led to peer commitment whereas exchange and pressure did not. These results provide guidance to CIOs who propose strategic information systems to peers.

Research in Progress

Session M2.1
Monday, 10:30–12:00 noon
Plaza 3

The Impact of Human Resources Practices on IT Personnel Commitment, Citizenship Behaviors, and Turnover Intentions, Guy Paré, Michel Tremblay, and Patrick Lalonde, HEC–Montreal

The past few years have been the most threatening period for enterprises that use, manage, or deal in IT. The source of the tumult has been the demand, supply, recruitment, and, especially, retention of IT professionals. Recent literature reveals that a heavy investment in the implementation of HR practices may contribute to organizational success, specifically by reducing the turnover of IT professionals. As of today, very few empirical studies have rigorously examined the influence of relevant HR practices on turnover intentions of IT people. This study offers to fill that gap by testing an integrated model of turnover intentions that addresses the unique nature of the IT profession.

Boot Camp or Bordello: Whipping Rookies into Shape, June Bradley, Bradley Mann Consulting, and G. Michael McGrath, Macquarie University

The overhead associated with training new staff brought onto software development teams has long been a matter of concern for both information systems (IS) researchers and practitioners. The projected global shortfall in qualified IT professionals in coming years only serves to emphasize the importance of this issue. This is particularly so, given that it is generally recognized that training overhead may outweigh any benefits derived from adding new members to a project team.

Thus, the issue of on-the-job training has received plenty of attention from IS researchers. There is, however, a notable lack of useful prescriptive guidelines in the literature and practitioners tend to rely very much on heuristics (developed largely from individual experience). Our own view is that most commonly-used estimates for veteran training efforts and rookie assimilation are too low. In addition, we believe that a much finer-grained level of detail is required in any model proposed as a useful decision support aid in this area. At the very least, we contend that such a model should encompass project and organizational characteristics; rookie experience, ability, and skills match with project requirements; and, following from this, training needs.

To test this, we have embarked on a series of case studies. Stage 1 is exploratory and developmental, major aims being the development of a system dynamics model of on-the-job programmer training and the generation of a set of hypotheses. Stage 2 involves the testing of these hypotheses. Essentially, the systems dynamics model is a representation of Stage 1 findings. Typically, in systems dynamics models, most variance is caused by a limited number of parameters. Thus, by identifying these and employing replication logic, we can construct a set of Stage 2 field studies that we can use to validate, refute, or refine our Stage 1 findings.

Integrating Three Theoretical Perspectives to Explain Internet-Based Technology Usage by University Students: A Qualitative Study, Sabine G. Hirt and Moez Limayem, City University of Hong Kong

This study explores how and why university students use Internet-based communication technologies. The study relies on qualitative data collected in the form of interviews, recording of actual postings, and student records over the period of one year (two semesters). The data are interpreted through three mutually complementary theoretical lenses, originally developed to understand adoption and usage processes of information technologies: Orlikowski and Robey's (1991) adaptation of Giddens' (1984) structuration theory, Markus' (1987) critical mass theory, and Fulk et al.'s (1987) social information processing model. Anticipated contributions include the development of guidelines and "intervention strategies" designed to help instructors encourage technology adoption and use for out-of-classroom communication, ideas to improve the technology's technical features, identification of criteria to assess the merits of Internet-based technologies for teaching purposes, and an extension and refinement of the theoretical frameworks informing this work.

Session M3.1
Monday, 2:00 p.m.–3:30 p.m.
Plaza 1

The Impact of Enterprise Resource Planning Systems on Firm Performance, Robin Poston and Severin Grabski, Michigan State University

Debate exists regarding the contribution of information technology to firm performance. Prior research has examined technology and firm performance in the aggregate. This study, however, focuses on a specific technology—enterprise resource planning (ERP)—and its impact on firm performance. Economic and industrial organization theories are used to predict how ERP technology should affect firm coordination and transaction costs. ERP is expected to (1) reduce costs by improving efficiencies through computerization and (2) enhance decision making by providing accurate and timely enterprise-wide information. These effects should be associated with improved firm performance. This issue is examined empirically using archival financial data of COMPUSTAT firms that have implemented ERP systems compared to control firm counterparts. Results indicate a significant increase in costs as a percentage of revenue but a decrease in the number of employees as a percentage of revenue the year after ERP implementation. However, control firms experience a greater reduction in employees. Results indicate a paradox where firms having fewer employees supporting more revenue simultaneously experience higher cost to revenue ratios after their ERP implementation.

A Delphi Examination of Public Sector ERP Implementation Issues, She-I Chang, Guy Gable, Errol Smythe, and Greg Timbrell, Queensland University of Technology

A Delphi survey of ERP life cycle management issues was conducted within five agencies of the Queensland government. The five agencies each implemented SAP Financials at around the same time using the services of a common implementation partner. Responses were elicited from ERP project participants, from managers at the agencies, and from users of the financial systems. Valid questionnaires were returned from 61 respondents in the first round survey (response rate = 55%) and yielded 274 perceived issues. Through two rounds of the Delphi survey, these issues have been summarized and categorized into 10 major issue categories (with 38 sub-issues). The final survey round in which respondents will assign weights to these issues is currently underway. Lessons drawn from this study will assist in understanding the ERP life cycle and specific characteristics of the public sector ERP life cycle, and will provide insights into the strengths and weaknesses of ERP systems for public sector organizations.

A Contingency Analysis of Post-Bureaucratic Controls in IT-Related Change, May Tang, Siew Kian Sia, Christina Soh, and Waifong Boh, Nanyang Technological University

Recent developments in IT-enabled change have sparked many discussions on the emergence of a new management paradigm beyond bureaucracy. However, many of these studies are anecdotal or descriptive in nature, with few empirical studies. This research attempts to address this problem by developing a contingency framework within which the impact of information technology (IT) implementation on forms of post-bureaucratic controls is examined. It identifies post-bureaucratic control as a portfolio comprising empowerment, and panoptic or ideological control and argues that the emergence of these controls will differ, depending on the nature of the task structuredness and the context of IT-enabled change. It argues that the panoptic visibility afforded by the new technology enables management to decentralize power to employees without completely losing control. However, the ability to textualize behaviors in unstructured tasks is limited. In compensation, management will use ideological control to ensure that organization goals are met. Using a mixed methodology of qualitative and quantitative methods, two organizations, one undergoing an automational change and another a transformational change, were selected as cases to illustrate the framework. This study should prove interesting to researchers as it undertakes an empirical examination of post-bureaucratic controls and proposes a contingency framework to tie up apparent contradictions in findings. It also identifies new forms of control beyond bureaucracy, which practitioners may find are becoming increasingly relevant in a more fluid, uncertain "new economy."

Session M3.2
Monday, 2:00 p.m.–3:30 p.m.
Plaza 2

Competition Across Channels: Do Electronic Markets Complement or Cannibalize Traditional Retailers? Sivakumar Viswanathan, New York University

Existing research on electronic markets has focused largely on analyzing their efficiency and welfare-enhancing properties, treating these markets as isolated entities. In reality, however, electronic markets coexist with traditional, land-based firms. They compete not only with similar rivals, but also with firms with different competencies, information technology, channel characteristics, and business cultures. The interaction between these different firms involves complex and interesting competitive dynamics, which cannot be captured by isolated models of electronic markets.

This paper models competition between firms that sell their products purely through electronic channels, firms whose primary retailing outlets are traditional land-based channels, and hybrid firms—those selling both off-line and online. A game-theoretic spatial differentiation model is used to analyze the impact of the coexistence of new, emerging technology-driven distribution channels with conventional retail channels, and the possible strategic interactions between these two vastly different retail environments. The features of market equilibria, and their sensitivity to different technological and channel parameters are studied, and the results of the model are compared with the benchmark case where the electronic markets are independent of traditional markets.

Results show that the profits of firms in competing channels increase as they differentiate themselves as much as possible from each other, and by differentiating themselves based on the characteristics over which consumers have the maximum variety in relative valuations. The choice of the factors of differentiation, however, is crucial, as are the relative sizes of the online and offline markets. The results also indicate that neglecting the impact of traditional markets on online firms risks oversimplification, and might lead to incorrect prescriptions to offline, online, and hybrid firms.

Mechanisms for Coping with Unfair Ratings and Discriminatory Behavior in Online Reputation Reporting Systems, Chrysanthos Dellarocas, Massachusetts Institute of Technology

Reputation reporting systems have emerged as an important risk management mechanism in online trading communities. However, the predictive value of these systems can be compromised in situations where conspiring buyers intentionally give unfair ratings to sellers or where sellers discriminate on the quality of service they provide to different buyers. This paper proposes a set of mechanisms that eliminate or significantly reduce the negative effects of such fraudulent behavior. The proposed mechanisms can be easily integrated into existing online reputation systems in order to safeguard their reliability in the presence of deceitful buyers and sellers.

Clicks vs. Bricks: Toward a Model of Internet-Induced Channel Competition, Paul Chwelos, University of California, Irvine, and Michael J. Brydon, Simon Fraser University

The overall objective of this program of research is to develop a model of Internet-induced channel competition. In this paper, we focus on the ways in which retail channel technology—specifically, the online vs. bricks and mortar stores—affects the feasible trade-offs that firms can make between price and desirable attributes of their product/service bundles.

This paper treats products as a bundle of the physical good and the fulfillment or transaction technology, and proposes a model of competition in the price-attribute space to illustrate the tradeoffs for consumers and producers. This model is grounded in demand, production, and hedonic theory, and relates the attributes (or “quality”) of products to their observed prices.

Our objectives in future research are to refine the analytical model and to find evidence that (1) the functional forms assumed in the model are consistent with the price/attribute trade-offs observed in practice and (2) the observed competitive responses of firms dominated by online competitors are consistent with those prescribed by our model.

Session M4.1
Monday, 4:00 p.m.–5:30 p.m.
Plaza 2

Trust in E-Commerce Vendors: A Two-Stage Model, D. Harrison McKnight, Florida State University, Vivek Choudhury, University of Cincinnati, and Charles Kacmar, Florida State University

This study investigates the development of trust in a Web-based vendor during two stages of a consumer’s Web experience: exploration and commitment. Through an experimental design, the study tests the effects of third party endorsements, reputation, and individual differences on trust in the vendor during these two stages.

Initial Trust, Perceived Risk, and the Adoption of Internet Banking, Kyu Kim, University of Cincinnati/Inha University, and Bipin Prabhakar, University of Cincinnati

Studies on the adoption of business-to-consumer e-commerce have not simultaneously considered trust and risk as important determinants of adoption behavior. Further, trust in information technology has not been addressed to a great extent in the context of e-commerce. This research explicitly encompasses the electronic channel and the firm as objects to be trusted in e-commerce.

Our conceptual model leads us to believe that trust in the electronic channel and perceived risks of e-commerce are the major determinants of the adoption behavior. Based on the social network theory and the trust theory, determinants of trust in the electronic channel are included in the research model.

This research is expected to provide both theoretical explanations and empirical validation on the adoption of e-commerce. We will also be able to offer specific recommendations on marketing strategies for practitioners, regarding the adoption of Internet banking.

Trading Partner Trust in Electronic Commerce Participation, Pauline Ratnasingham, Victoria University of Wellington, and Kuldeep Kumar, Florida International University

The growth of business-to-business e-commerce has highlighted the role of computer and communications technologies as well as inter-organizational trust in developing and maintaining business-to-business relationships. Despite the acknowledged importance of trust, only a limited amount of research exists and that examines the role of trust in these relationships. By investigating inter-organizational relationships and trust in e-commerce, this study will enable us to identify factors leading to successful e-commerce participation (adoption and integration). Drawing on theories such as trust in business relationships, inter-organizational relationship theories, transaction cost economics, and resource dependency theory, this paper develops a conceptual model to examine the impact of trading partner trust in e-commerce participation. The model is currently being tested through multiple in-depth case studies. The findings of the case studies are expected to increase the awareness of e-commerce adopters and implementers about the importance of trading partner trust in e-commerce participation.

Session M4.2 Monday, 4:00 p.m.–5:30 p.m. Plaza 3

A Proposed Model and Measurement Instrument for the Formation of IS Satisfaction: The Case of End-User Computing Satisfaction, Wynne W. Chin, University of Houston, and Matthew K. O. Lee, City University of Hong Kong

This paper presents a model that explicitly defines satisfaction and the antecedent factors that help form it. The model distinguishes between the notions of expectations and desires and argues that both have an impact on overall satisfaction in the form of the difference between priors and post hoc usage perceptions coupled with the individual's evaluation of these discrepancies. These two types of satisfaction, in turn, will have both direct and multiplicative impact on overall satisfaction. Given this understanding, we highlight possible limitations in existing instruments and provide a solution for creating new measures that should overcome these limitations. A complete set of measures is provided in this paper for future empirical testing, which are general enough to allow researchers to create measures for other aspects related to IS satisfaction beyond those targeted in this paper. We employ our model within the context of the five satisfaction areas outlined by Doll and Torzadeh (1988). Building upon their initial set of perceptual measures, we examine whether there are indeed two types of discrepancy effects, whether there are multiplicative effects for each discrepancy, and whether there is a higher order interaction between the two discrepancy components. Partial least squares analyses of data consisting of over 200 instructional staff member at a large university related to their satisfaction with an online grading system are employed and the results presented at the conference.

Content Versus Structure in Information Environments: A Longitudinal Analysis of Website Preferences, Michael J. Davern, New York University, Dov Te'eni, Bar-Ilan University, and Jae Yun Moon, New York University

From the prospective traveler surfing the web for cheap vacations to executives analyzing market trends with a data warehouse, at home and at work, people are confronted with increasingly richer information environments. This study is an attempt at modeling the behavior over time of the "information consumer" (web surfer or executive) in such environments. The objective is to gain a better understanding of how to design the technologies that support and enhance the interaction with these information environments. Two key design variables for information environments are examined: content quality and structural quality. Drawing on research in human-computer interaction and ecological psychology, a behavioral model is developed in which it is postulated that the importance of structural quality will diminish with time, whereas content quality will increase in importance. A two-stage methodology is employed which combines a longitudinal experiment with a cross-sectional survey. Both the survey and experiment are conducted in the context of informational websites. The experiment provided 178 undergraduates with repeated exposure over several weeks to eight custom-built websites, manipulated to vary in content quality and structural quality for which their preferences (and associated rationales) were elicited at three time points over the course of the experiment. Additionally, 163 of the undergraduates also completed a survey providing data about the effect of content and structure on usage behavior for sites for which they had mature experience. Preliminary results of the experimental data support the hypotheses. The research has potentially significant implications for the design of information environments.

Of Mice and Users, Paul Beckman, San Francisco State University

Human-system interaction research proposes that human performance will be higher when there is greater similarity between user, task, and interface characteristics. Force-feedback devices have recently become available as economically feasible additions to human-system interfaces. An experiment is proposed to investigate two aspects of applying force-feedback to the human-system interaction. At a higher level, the experiment will attempt to both (1) specify those user characteristics that most affect the ability of the force-feedback device to influence user performance and (2) extend prior research on task/interface characteristic concordance into the realm of force-feedback devices. At a lower level, the experiment will attempt to derive the most appropriate ways that a force-

feedback input/output device can be customized or applied to best enhance a human user's performance on typical home/office computer tasks.

A pilot study and experiment are described in which subjects will complete typical home/office computer-based tasks with both a standard and a force-feedback mouse. Subjects will be tested for their abilities and aptitudes with the force-feedback mouse. An analysis of task performance by subject and device should shed light on both the user/interface and task/interface relationships when the interface is moderated by the use of force-feedback.

Session T2.1
Tuesday, 10:30 a.m.–12:00 noon
Plaza 3

Virtual Teams: Managerial Behavior Control's Impact on Team Effectiveness, Gabriele Piccoli, Cornell University, and Blake Ives, Louisiana State University

Virtual teams, enabled by information technology, represent a new organizational form that has the potential to change the workplace and provide organizations with increased levels of flexibility and responsiveness.

A gap exists in the current information systems literature. Previous studies seem to implicitly assume that virtual teams will be self-directed—i.e., that managerial control mechanisms are not required in this setting. This study makes this assumption explicit and tests it.

Propositions are developed and tested based on an extension of team effectiveness research in a colocated environment. The contribution of managerial behavior control practices to virtual team effectiveness is also evaluated by juxtaposing self-directed teams with virtual teams where managerial behavior control is enforced.

Knowledge Sharing Practices and Technology Use Norms in Dispersed Development Teams, Deborah Sole and Lynda Applegate, Harvard Business School

Dispersed, cross-functional development teams—a particular type of virtual team—confront a wide range of knowledge-based challenges in their dispersed work. Encompassing diverse sources of task-relevant knowledge, such teams present rich opportunities for exchanging and combining knowledge—activities at the heart of an organization's ability to innovate (Grant 1996; Schumpeter 1934). Yet empirical studies from distinct research streams indicate that both knowledge diversity and geographic separation also challenge the effective exchange and ability to leverage knowledge. This study explored how such teams interact to overcome the barriers and reap the benefits of their “built-in” knowledge diversity. In particular, we sought to understand (1) how teams use various collaborative technologies at their disposal to share knowledge and (2) whether shared—or disparate—expectations around the use of those technologies influenced knowledge sharing practices. In-depth, multi-method field research of dispersed new product development teams in a multinational company forms the empirical basis of this work.

A Qualitative Analysis of Structural Emergence and Ascendant Leadership in Technological Appropriation, David W. Miller and John P. Bartkowski, Mississippi State University, and Wm. David Salisbury, Ohio University

Recent scholarship on the appropriation of advanced information technology in professional settings has utilized adaptive structuration theory (AST) to move beyond voluntaristic and deterministic perspectives on workplace interaction. Our study seeks to advance the paradigm of adaptive structuration in both theoretical and empirical terms. First, we make a case for a reconceptualization of the duality of structure in AST by integrating insights from William Sewell's (1992) perspective on this important facet of structuration. Sewell suggests that structures are composed of both schemata (transposable recipes for social action) and resources (animate or inanimate objects actors use to exercise power). Second, we reveal how this reconceptualization of the duality of structure can open up new avenues for research on the appropriation of group decision support systems (GDSS) among work teams. To this end, we analyze interaction fragments—i.e., conversational and gestural exchanges—observed in a sample (N = 10) of over 60 video recorded sessions of GDSS appropriation in quasi-experimental workgroups. In five of the workgroups, the technology was introduced by a facilitator (restrictive treatment); the other five groups were introduced to the GDSS by a chauffeur (non-restrictive treatment). Preliminary results, which we will continue to pursue with an analysis of the full slate of 60 video recordings, reveal how participants transpose culturally meaningful interaction strategies—schemata—to consolidate animate and inanimate resources in the GDSS environment. We term this process “ascendant leadership” and provide rich descriptions of the ways in which such power is exercised and contested across these two different treatment contexts.

Session T3.1
Tuesday, 2:00 p.m.–3:30 p.m.
Plaza 2

External IT Environment: Dimensionality and Measurement, C Ranganathan, Southern Illinois University, Carbondale, and Vijay Sethi, Nanyang Technological University

Although the importance of the external IT environment has been recognized in the literature, there has been little effort to conceptualize the theoretical dimensions of this construct and develop operational indicators to measure it. Our research addresses this gap and seeks to

develop the theoretical dimensions and operational measures for external IT environment and empirically validate them. We use qualitative data obtained from interviews with 27 senior IT executives to identify three broad dimensions of external IT

environment—namely, IT munificence, IT dynamism, and IT activity intensity. Operational measures for these dimensions were also developed from qualitative research. Subsequently, an instrument was developed to empirically measure the dimensions of the external IT environment. The validity of the dimensions and its operational indicators are being tested with data collected from a survey of 223 IT executives.

A Content-Analytic Longitudinal Study of the Drivers for Information Technology and Systems Outsourcing, Jahyun Goo, Rajiv Kishore, and H. Raghav Rao, State University of New York, Buffalo

This research addresses the question, what are the key drivers for information technology and systems (ITS) outsourcing? ITS outsourcing drivers are examined in this research in light of several underlying organizational and economic theories in order to generate a comprehensive and enduring ITS outsourcing drivers taxonomy. A preliminary taxonomy has been developed using qualitative content analysis of 49 articles, which has been triangulated using an internal/external drivers model developed from systems-theoretic notions. Quantitative content analysis technique is being used to analyze outsourcing reports publicly available in the PR Newswire database published over the last 11 years to further develop the ITS outsourcing drivers taxonomy.

How Do Information and Communication Technologies Reshape Work? Evidence from the Residential Real Estate Industry, Kevin Crowston, Syracuse University, Steve Sawyer, Pennsylvania State University, Rolf Wigand and Marcel Allbritton, Syracuse University

We are exploring how information and communication technology (ICT) use affects the work lives of real estate agents, the process of selling/buying houses, and the overall structure of the residential real estate industry. Earlier stages of our work involved intensive field research on how real estate agents use ICT. In this paper, we report on the design and analysis of a pilot survey of 868 agents intended to investigate their ICT use more generally. Analysis of the 153 responses to this survey sheds light on how ICT use supports information control, enables process support, and helps agents to extend and maintain their social capital.

Session T3.2 Tuesday, 2:00 p.m.–3:30 p.m. Plaza 3

Integrating Multi-Perspective Views into Ontological Analysis, Michael Rosemann, Queensland University of Technology, and Peter Green, University of Queensland

It is argued that contribution to the theory and practice of the analysis and design of information systems and services within organizational contexts requires the following steps. First, an underlying theoretical domain is needed. Second, the constructs of this domain have to be communicated using some commonly understood “language.” Third, these constructs have to be applied to purposes that are of interest to users, particularly business users. Finally, this application needs to take into consideration the constraints that users work under and, particularly in business, the need for cost effectiveness. It is claimed that the models developed by Bunge, Wand and Weber (BWW models), in particular the representation model, provide a good starting point for this theoretical foundation. In order to communicate the BWW models, an ER-based meta model for the BWW representation model is suggested. A common issue about some of the results with a number of the ontological analyses that have been done so far is the lack of relevance and cost effectiveness. This situation suggests that integrating perspectives into the process of ontological analysis would improve the usefulness of the results to users. Specifically, ensuring the relevance of the results to the different purposes of different users would improve the usefulness of the ontological analysis to users of modeling grammars. Accordingly, the application of a third dimension—the cost effectiveness dimension—to the analysis of modeling grammars using the BWW representation model is investigated. Specifically, the requirements of activity-based costing systems are analyzed as a first example of a perspective.

Managing Accounting Information Quality: An Australian Study, Hongjiang Xu, University of Southern Queensland

The quality of the data provided is important to the success of accounting information systems. The evidence indicates that organizations have data quality problems. Accounting information systems are one of the core systems in the organization; therefore, knowledge of how to manage the quality of accounting information has become critical. The research proposed here will develop and test a model that identifies the critical success factors influencing data quality in accounting information systems. The research will involve case studies of accounting information quality in Australian organizations in practice and then will use case study findings to modify the initial research model and identify the possible set of success factors. This paper describes the overall objectives of this research and the methodology to be employed.

Knowledge Discovery for Decision Support in Law, Andrew Stranieri and John Zeleznikow, LaTrobe University

The Split Up project applies knowledge discovery techniques (KDD) to legal domains. Theories of jurisprudence underpin a classification scheme that is used to identify tasks suited to KDD. Theoretical perspectives also guide the selection of cases appropriate for a KDD exercise. Further, jurisprudence underpins strategies for dealing with contradictory data. Argumentation theory is instrumental for representing domain expertise so that the KDD process can be constrained. Specifically, a variant of the argumentation structure proposed by Toulmin is used to decompose tasks into independent sub-tasks in the data transformation phase. This enables a complex KDD exercise to be decomposed into numerous simpler exercises that each require less data and have fewer instances of missing values. The use of the structure also facilitates the development of information systems that integrate multiple reasoning mechanisms such as first order logic, neural networks or fuzzy inferences and provides a convenient structure for the generation of explanations. The viability of this approach was tested with the development of a system that predicts property split

outcomes in cases litigated in the Family Court of Australia. The system has been evaluated using a mix of strategies that derive from a framework proposed by Reich.

Session T4.1
Tuesday, 4:00 p.m.–5:30 p.m.
Plaza 1

The Development of Measures to Assess the Performance of the Information Systems Function: A Multiple-Constitutency Approach, Jerry Cha-Jan Chang, University of Pittsburgh/University of Nevada, Las Vegas, and William R. King, University of Pittsburgh

A Delphi survey of ERP life cycle management issues was conducted within five agencies of the Queensland government. The five agencies each implemented SAP Financials at around the same time using the services of a common implementation partner. Responses were elicited from ERP project participants, from managers at the agencies, and from users of the financial systems. Valid questionnaires were returned from 61 respondents in the first round survey (response rate = 55%) and yielded 274 perceived issues. Through two rounds of the Delphi survey, these issues have been summarized and categorized into 10 major issue categories (with 38 sub-issues). The final survey round in which respondents will assign weights to these issues is currently underway. Lessons drawn from this study will assist in understanding the ERP life cycle and specific characteristics of the public sector ERP life cycle, and will provide insights into the strengths and weaknesses of ERP systems for public sector organizations.

Value Assessment of IS/IT Service Provision Within Organizations, Gurpreet Dhillon and Jungwoo Lee, University of Nevada, Las Vegas

This paper presents a means-ends objectives network that can be useful in assessing value of IS/IT service provision in organizations. This network is developed following Keeney's (1992) method of value focused thinking. This paper also highlights the importance of engaging in value focused thinking by presenting step by step application of the concept. A total of 71 interviews were completed; the preliminary analysis recognizes two areas where adequate consideration of value propositions will help in improving IS/IT service provision. Currently, an instrument is under development using this framework for more generalizable results. Such an assessment will help in remedying the bottlenecks, if any, in improving the competence of the IS/IT functional unit.

The Relationship Between Psychological Ownership and IT-Driven Value, Michel Avital and Betty Vandenbosch, Case Western Reserve University

The concept of psychological ownership is employed in order to enhance our understanding of the relationship between users and information technology professionals and to describe the IT/business process relationship. We use co-ownership to signify a complementary relationship in which users are involved in IT while IT professionals are simultaneously involved in business processes. In an initial study, interviews at four organizations suggest that co-ownership explains information systems' success and top-rated returns from IT investments. In a second study, we are developing a measure of co-ownership and testing its effect on IT value and performance through a large-scale survey.

Session W1.1
Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 3

Is More Information Better? The Effect of Traders' Irrational Behavior on an Artificial Stock Market, Wei T. Yue, Alok R. Chaturvedi, and Shailendra Mehta, Purdue University

This paper presents a computer simulated artificial stock market to examine market rationality issues. We construct economic agents with different degrees of irrationality to participate in the stock market. The agents replicate the irrational behaviors described in the psychology and finance literatures and determine the outcome of the market. The main focus of this study is to examine the two contradicting (efficient market versus noise trading) finance hypotheses in the presence of rational and irrational traders.

The Experimental Analysis of Information Security Management Issues for Online Financial Services, Mukul Gupta, Alok R. Chaturvedi, and Shailendra Mehta, Purdue University, and Lorenzo Valeri, King's College London

E-commerce offers the banking industry great opportunity, but also creates a set of new risks and vulnerability such as security threats. Information security, therefore, is an essential management and technical requirement for any efficient and effective financial activities over the Internet. Still, its definition is a complex endeavor due to the constant technological and business change and requires a coordinated match of managerial and technical solutions. This research intends to provide an instrument to test and evaluate the strategies to counter threats facing online financial institutions through an artificial economic setup at the Synthetic Environments for Simulation and Analysis (SEAS) laboratory at the Krannert Graduate School of Management, Purdue University. The research also intends to provide guidelines for forming information security policies and strategies for survival and success in the dynamic and hostile business environment. Initial results indicate that online banks that were proactive in recognizing the threats and devising policies to counter them generated greater revenue and were able to focus on the core activities. Public disclosure of security breaches by the victim banks resulted in better overall health of the simulated economy. The simulation is still in its development and testing phase and the research team intends to present the findings at the conference.

Economic Mechanism Design for Securing Online Auctions, Wenli Wang, Emory University, Zoltán Hidvégi, IBM Corporation, and Andrew B. Whinston, University of Texas, Austin

Enhancing e-commerce security through computing technology alone is not sufficient. E-commerce designers should apply economic mechanisms to design proper digital processes that accommodate new perspectives raised in e-commerce. For instance, traditional auction mechanisms, such as the Generalized Vickrey Auction, are vulnerable to false-name bidding, an online fraud exploiting the lack of authentication over the Internet. We develop a Sealed-bid Multi-round Auction Protocol (S-MAP), which sells multi-unit identical goods. S-MAP is not only robust against false-name bidding but also simple and efficient.

Session W2.1
Wednesday, 10:30 a.m.–12:00 noon
Plaza 1

Managing Customer Turnover in Online Services: A Systems Thinking Approach, Amitava Dutta, George Mason University

Even as they enjoy impressive growth, one of the major challenges facing providers of online services is a high rate of customer turnover. It has adverse impacts on business performance and has therefore attracted management attention. The literature continues

to identify individual determinants of pre- and post-adoptive customer behavior in online services. However, their collective impact is less clear. In this research, we take a “systems thinking” view of turnover. The added value of the systems approach is that interaction among individual determinants and their feedback effects can be modeled. Besides representing the mechanics of turnover more accurately, this approach also allows one to examine the dynamics of turnover. Specifically, we develop a simulation model using the methodology of systems dynamics. Conceptual foundations for its structural components are offered. The model’s ability to replicate turnover behavior observed in practice further strengthens its validity. It can contribute to our understanding of the turnover phenomenon and, since the model can be simulated, provide decision support in managing turnover.

Effects of Consumer Lifestyles on Purchasing Behavior on the Internet: A Conceptual Framework and Empirical Validation, Dan Jong Kim, Bongsoon Cho, and H. Raghav Rao, State University of New York, Buffalo

The purpose of this research is (1) to develop a theoretical model for consumer purchasing behavior on the Internet and (2) to test the effects of consumer lifestyles in the form of price-oriented, net-oriented, and time-oriented lifestyles, and perceived benefit and perceived risk on purchasing behavior. Structural equation modeling is applied to test a hypothesized research model using Graphics Visualization and Usability Center (GVUC) online survey data. Results show that a consumer whose lifestyle is more net-oriented will perceive more benefits and fewer risks to online purchasing. Consumers who are more time-oriented will perceive more benefits to buying goods online than less time-oriented ones. Consumers who have more disposable income are also more prone to purchase online.

Electronic Commerce: The Impact of the Internet on Sales Practices in the Car Industry, Ulrike Schultze and Page Moreau, Southern Methodist University

E-commerce and Internet technologies are fundamentally changing the way companies do business. While much attention is paid to the profitability among the dot-coms and the viability of the new business models, there is much less focus on the impact of the Internet on the work practices of actual workers. As companies are developing new business models, existing work processes have to be adapted to the new environment in which communication is mediated by e-mail and the Internet. This new environment is marked by ubiquitous information access, asynchronous information exchange, and written communication. Depending on the extant information asymmetry and the degree and nature of the contact that workers need with their colleagues, customers, and trading partners, these attributes present both opportunities and challenges. In sales, for instance, a work context characterized by high equivocality, the increasing reliance on lean media like e-mail presents considerable challenges for sales people whose ability to “read” customers is curtailed.

Debates and Panels

Session M3.4
Monday, 2:00 p.m.–3:30 p.m.
Plaza 6

Debate **A Debate on the Blindness of IS Journal Reviews**
Moderator Detmar W. Straub, Georgia State University
Debaters Daniel Robey, Georgia State University
 Robert Zmud, University of Oklahoma

The IS journal reviewing process, as with most scholarly journals, is most often practiced as a double-blind process. In double-blind reviews, the journal’s editor-in-chief (EIC) and associate editor (AE) handling the manuscript are aware of the identities of authors, but the reviewers are not. The manuscript’s authors are unaware of both the identities of the AE and the reviewers but are, of course, aware of the name of the EIC. Some variation in this practice occurs across journals. For example, *Management Science* uses a single-blind process wherein both the AE and reviewers know the identities of authors but not vice-versa. However, most IS journals hold to a double-blind process.

The double-blind reviewing process has become institutionalized for a number of reasons, the most salient of these being to maintain objectivity of the review process. In evaluating manuscripts with no indication of author identity, reviewers presumably offer more objective evaluations of the work, independent of the evaluations of the authors. Likewise, reviewers are likely to be more candid when rendering evaluations if they know that their own identities will be concealed from the authors. Blind reviewing mitigates suspicions of unfair practices and offers scholars without reputations the advantage of a level playing field in which their ideas compete equally for journal space with more well-known authors.

Despite these presumed advantages of blind reviewing, the desirability of the status quo described above is being challenged by some of the individuals involved with journal editorial processes. For example, some advocates of electronic journals/letters have argued that the collaborative nature of new technology enables a more “open” and egalitarian reviewing process. Moreover, some traditional “paper” journals have also recently questioned the merits of a more open review process. In particular, senior editors at *MIS Quarterly* are currently running an “experiment,” utilizing a completely open reviewing process on a paper submitted to the journal (with, of course, agreement by all the parties involved).

There are interesting theoretical arguments that would suggest either the continuance of blind reviewing or its abandonment. Information asymmetry theory suggests that there are power differentials created when one group possesses information that other groups do not have. These may be viewed positively or negatively. Information asymmetries also can lead to adverse selection, role conflicts, and other effects. The debaters may or may not choose to investigate such theoretical impacts, but the debatable topic has many dimensions of interest to the IS field, including ethical dimensions.

Should the reviewing process for IS journals be blind or non-blind? Is the double-blind process an idea that has stood the test of time or an idea that has lasted beyond its time? Would a completely open review process produce more biased or less biased outcomes? Would a completely open review process add more or less value within the review process? Would a completely open review process have a positive or negative impact on IS scholarship as published in the field’s top journals?

Session T4.5 Tuesday, 4:00 p.m.–5:30 p.m. Plaza 6	Debate Does the Trend Toward E-Business Call for Changes in Fundamental Concepts of Information Systems? Moderator Steven Alter, University of San Francisco Proponents M. Lynne Markus, Claremont Graduate University/City University of Hong Kong Judy Scott, University of Colorado, Denver Opponents Phillip Ein-Dor, Tel Aviv University Iris Vessey, Indiana University
---------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

This debate is directly related to the theme of ICIS 2000, “Fundamental Concepts for the New Millennium.” It asks whether the fundamental information system concepts developed and used during the past millennium are becoming inadequate and should, therefore, be supplanted by new information system concepts as e-business becomes more commonplace throughout most businesses.

During the early development of the IS field, information systems were for after-the-fact tracking, reporting, and analysis. Someone did the work, the information system recorded information, and managers used the information for planning and control. As interactive computing took hold, the information system became integrated into the process of doing the work, rather than just recording results and completions of interim work steps. Today, many business schools are launching e-commerce or e-business initiatives. Simultaneously, many consultants and academics are predicting that computer and communications applications will soon be so intertwined with typical business practices that there will be little or no difference between business and e-business.

In order to include almost any organization, rather than just those primarily engaged in e-commerce or those selling information products and services, we will interpret e-business as an operating style rather than a characterization of a business strategy (such as “clicks and bricks”). The trend toward e-business is a trend toward an operating style in which most of an organization’s significant work systems make extensive use of both computer and communications technologies in order to operate efficiently and effectively. Internet technology has provided a new level of cost-effectiveness in many areas, but the trend toward e-business is not limited to the Internet because other types of networks may be more effective for transmitting particular types of information for particular purposes (such as mobile payment systems, real time monitoring systems, and downloads of streaming video).

Session M2.5
Monday, 10:30–12:00 noon
Plaza 1

Panel **Fundamental Concepts and Approaches for Investigating Virtual Teamwork**
Chair Sajda Qureshi, Erasmus University Rotterdam
Panelists Doug Vogel, University of Hong Kong
 Sirikka Jarvenpaa, University of Texas, Austin
 Katherine Cudoba, Florida State University

The concept of virtual teamwork continues to elude us while we study it. Some would suggest that virtual teams are not really teams, but individuals brought together through technology (Zigurs and Qureshi forthcoming). How, then, do individuals brought together through technology function as a team in this virtual workspace? What are the impacts of Group Support Systems (GSS) and other technologies designed to support teams? What are the identifying characteristics and adaptations that occur as individuals use technological support to function as a virtual team? And what are the social consequences? While the practical applications of virtual teams are many, the results are often mixed and success stories limited. The main challenge facing researchers is how to go about studying this increasingly prevalent but enigmatic phenomenon and arriving at practically relevant knowledge with respect to effectiveness in virtual teams.

Session M4.5
Monday, 4:00 p.m.–5:30 p.m.
Plaza 6

Panel **Data Quality in Internet Time, Space, and Communities**
Chair Yang W. Lee, Northeastern University
Panelists Paul L. Bowen, University of Queensland
 James D. Funk, S. C. Johnson and University of Wisconsin, Parkside
 Matthias Jarke, GMD-FIT and RWTH Aachen
 Stuart E. Madnick, Massachusetts Institute of Technology
 Yair Wand, University of British Columbia

Quality data is a key resource for planning, producing, and communicating in the new millennium. Use of data transcends time, space, and communities. With the use of the Internet increasing dramatically, poor-quality data can be processed and distributed faster than ever and wider than ever. Reports on impacts of data quality range from customer dissatisfaction, stoppage of business operation, and reduced revenue, to human loss (Huang et al. 1999; Redman 1996). Equally critical, but under-reported, ramifications of poor-quality data include jeopardizing the capacity to understand new dynamics and the context of global business, to understand changing customers' view, and to understand how to respond to new opportunities.

Just this year, NASA lost its Mars Climate Orbiter. The spacecraft flew too close to the planet and burned up in the Martian atmosphere. The Orbiter was lost and the project failed, in part, because the NASA scientists simply did not convert data between metric and non-metric units. This failure to properly convert data in the appropriate context is only one example among other more complicated data quality problems researchers and practitioners strive to solve.

In this panel, we will take stock of the status of research on data quality from diverse perspectives and across national boundaries. We will then discuss key emerging data quality issues and suggest directions to understand and solve these problems.

The panel will address a set of critical questions: How do different perspectives on data quality define and solve data quality problems? Do different approaches shape different solutions to the same problems? Are we facing different problems in the Internet era and thus need a fresh look at how we approach framing and solving data quality problems?

Session T2.5
Tuesday, 10:30 a.m.–12:00 noon
Plaza 1

Panel **The Role of IT in the Creation of Sustainable Communities**
Chair David B. Paradise, Florida State University
Panelists James F. Courtney, Jr., University of Central Florida
 Kalle Lyytinen, University of Jyväskylä
 Jaana Porra, University of Houston

A community is a collection of people with similar interests living in a particular area. A community, therefore, has two parts: the people and the area in which they live. One of these parts is a system we typically call "society." Society is the enduring social group to which we all belong. The second part is a system that is our "ecosystem." Our ecosystem is the physical environment in which we interact with other members of society. Our ecosystem is the land, the streams and lakes, the woodlands, even the urban parks where we work, live, play, and relax.

A *sustainable* community is one that can continue functioning into the indefinite future without being forced into decline through exhaustion of key resources. A United Nations report (2000) advocates an "ecosystem approach" to dealing with issues of sustainability. Such an approach emphasizes the need for both good scientific information and sound policies. On the scientific side, an ecosystem approach should recognize the "system" in ecosystem, managing it holistically. On the political side, appropriate information should be assembled to support a careful weighing of trade-offs among various ecosystem goods and services and among environmental, political, social, and economic goods. Many people feel problems inherent in creating sustainable communities are best addressed through a collaborative and holistic systems approach because such problems are diffuse, multidisciplinary, multiagency, multistakeholder, and multisector in nature.

Information technology (IT) is redefining our notions of “community.” IT-supported virtual communities are beginning to emerge. A virtual community is a community of people sharing common interests, ideas, and feelings over the Internet or other collaborative networks. In his book, *The Virtual Community*, Howard Rheingold (creator of a virtual community named “the WELL”) defines virtual communities as social aggregations that emerge from the Internet when enough people carry on public discussions long enough and with sufficient human feeling to form webs of personal relationships in cyberspace. While many virtual communities are successful in enticing individuals to return often, it is not clear why. Our current knowledge of communities offers little help. The only common feature of all human communities—that they have to do with people who “live” together—has recently been replaced by ideas embracing “imagined communities” and communities as “sequences of related messages.” The foundations of these “virtual communities” are currently not based on understanding how nature lives together over time.

Historically, communities have been conceptualized in terms of classical mechanistic systems (bureaucracy, formal systems, computers, etc.) or organic systems (progressive, adaptive, etc.). These metaphors have provided the only theoretical backdrops for our modern models. A third model, however, using the metaphor of colonies exists. Colonial systems are predicated on a species-level model of Eldredge and Gould’s (1972) punctuated equilibrium. When compared with the mechanistic and organic assumptions, colonies appear to (1) maintain stability for long periods and (2) adapt to extremely large ecological shifts. In our modern abstraction of the colonial model to the Internet, “information colonies” may be a more appropriate organizing metaphor. Still, the extent to which virtual communities share characteristics with non-virtual communities is unknown. Likewise, how virtual communities differ from non-virtual communities has yet to be identified.

IT also provides an opportunity for a collaborative and holistic approach. IT can provide a greater integration of systems that are interrelated yet typically separate and isolated from a technology perspective. Examples abound of municipal service systems (e.g., roads, communications, power, and waste removal) that all contribute to a citizen’s quality of life yet function independently from an information processing perspective. Other systems in which information processing should be a core competency (e.g., emergency response systems, criminal justice systems, and health and human services systems) don’t perform much better. One may reasonably question why these systems don’t function better than they do, especially in light of the many advances that have been made in IT capabilities. All the while, world-wide IT integration via the Internet becomes increasingly viable, advances in information technology allow us to manipulate information in realms never before possible (e.g., the Human Genome Project) and organizational structures change drastically under the influence of IT capability (e.g., telecommuting).

Session T3.5
Tuesday, 2:00 p.m.–3:30 p.m.
Plaza 1

Panel **IS Research Ethics: Defining Ethical, Barely Ethical, and Unethical Behavior**
Chair Ned Kock, Temple University
Panelists Robert Davison, City University of Hong Kong
Roger Clarke, Australian National University
Karen Loch, Georgia State University

Even though formal codes of ethical conduct for research exist within the scope of individual research institutions, such as research centers and universities, there is no generally accepted ethical code of research for the field of information systems (IS) as a whole. But, should we be concerned about the lack of an ethical code for IS researchers? Is this really an issue of significant importance for the field?

Our answer is yes. We do believe that this issue is of vital importance for the field.

Given the very nature of research endeavors, few things can undermine the credibility of IS researchers and the IS field as badly as behaviors such as plagiarism and data fabrication, behaviors that most people would regard as unethical. The IS field is made up of a large number of IS researchers distributed in many countries around the world, comprising people with often completely different cultural and social backgrounds. Given this, it is only natural that there exist different practices and beliefs as far as what is ethical and what is not in IS research. Furthermore, there may well be significant obstacles to overcome before all can agree upon an ethical code.

Session W1.4
Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 1

Panel **Three Perspectives: If Markus’ 1983 Classic Study, “Power, Politics, and MIS Implementation,” Were Being Reviewed Today**
Chair Allen S. Lee, Virginia Commonwealth University
Panelists Michael Myers, University of Auckland
Guy Paré, École des Hautes Études Commerciales
Cathy Urquhart, University of the Sunshine Coast
Commentator M. Lynne Markus, City University of Hong Kong

The 1983 study by M. Lynne Markus, “Power, Politics, and MIS Implementation,” is a classic in the study of information technology in organizations. The web version of the Social Science Citation Index shows that over 200 other published studies have cited Markus’ classic since 1993 (the earliest year covered by the web version of the SSCI). Furthermore, its universal appeal is evident in its being regarded as an exemplar of not only positivist research (Lee 1989), but also interpretive research (Walsham 1993).

Does our research field of information systems (IS) appreciate Markus’ study only for its having offered a theory good for its time (much as physicists still appreciate and even teach classical physics although the theory of relativity has superseded it) or does our field appreciate Markus’ study because its theory about information technology in organizations remains as true today as it was in 1983? At the same time,

considerations about theory are inseparable from considerations about method: would our field today deem Markus' case research method to be valid, or instead judge it to be dated relative to contemporary qualitative methods?

To assess the merits of Markus' 1983 study today, three panelists will review Markus' study as if it were submitted for publication in *MIS Quarterly*. The reviewers' recommendations (accept, reject, or revise) will be interesting in themselves, but will not tell the entire story. A contemporary reviewing of Markus' 1983 study promises to be interesting not only for a fresh assessment of Markus' 1983 theory and method, but also for providing some signs about how the IS research field has developed since 1983.

In particular, what difference would the advances in IS theory (what we know about information technology in organizations) and method (how we know what we know about information technology in organizations) make to a contemporary assessment of Markus' study? Would we consider the resulting assessment of Markus' theory and method—as exemplary, merely adequate, or outdated—to be itself satisfactory? Would the contemporary distinction of research approaches into separate positivist, interpretive, and critical perspectives still see value in Markus' 1983 study, which made no such distinction? Would the new or different difficulties that Markus' study ends up encountering in the review process in 2000 indicate shortcomings of 1983 research as measured against 2000 research standards (and, hence, progress in the state of the art of IS research), or shortcomings of 2000 research standards as measured against exemplary information systems research (and, hence, a lack of progress in IS research since 1983)?

The preceding questions are only suggestive, not exhaustive, of the different issues that can arise from a contemporary assessment of Markus' 1983 study and to which members of the audience can react. The value of this panel will not end with the content of the reviews that the panelists provide of Markus' study, but will extend to reflections and reactions from the panel's audience on whether there have, or have not, been significant developments since 1983 in matters of broader concern that include the following: IS reviewing practices, IS reviewing standards, IS research genres, the state of the art of IS theory, the state of the art of IS method, and the IS research culture overall.

Session W2.4 Wednesday, 10:30 a.m.–12:00 noon Plaza 6

Panel Addressing the IT Skills Crisis: Gender and the IT Profession

Chair Denis M. S. Lee, Suffolk University

Panelists Sue Nielsen, Griffith University

Eileen M. Trauth, Northeastern University

Viswanath Venkatesh, University of Maryland, College Park

At the same time that unprecedented opportunity exists for IT professionals around the world, the field is experiencing an IT skills crisis that stems from the shortage of qualified IT professionals. It is, therefore, ironic that despite significant growth in the IT professions, there remain segments of the population under-represented in IT. Among those under-represented in IT are women. In some countries there is evidence of declining participation by women in the IT profession. The question on the minds of those concerned with IT human resources and the development of qualified IT professionals is: Why? A deeper understanding of this question is necessary for the development of appropriate IT human resource strategies.

According to the National Science Foundation, the under-representation of women and minorities in the American IT workforce is sufficiently serious to warrant systematic research efforts to address this national problem (NSF 2000). The panel addresses this issue by presenting the results of current research that represents three different theoretical perspectives on gender and IT. These different viewpoints on gender are reflected in recent literature about women's engagement with IT and participation in the IT field.

The *differential psychology* perspective looks at gender differences in technology acceptance. This view offers a socio-cognitive explanation for observed gender differences. Another view is that IT is *socially constructed* as a male domain. Therefore, women, who are subjected to different social influences, need to adjust to this male domain in order to be successful in the IT field. A third perspective is that there exists a continuum of *individual differences* with respect to IT capability and interest that cuts across both genders. This view holds that attitudes about gender and IT are socio-culturally constructed at the individual level.

Each panel presentation will address the following questions from the vantage point of its perspective on gender and IT:

- Are women physically, psychologically, socially, or culturally unsuited to IT work, to the IT profession?
- Does a woman have to be "different" in order to be successful in IT?
- What is the prevailing view in different countries regarding women working in IT?
- What do the answers to these questions imply about future directions for research and practice in the IT field?

The panel chair will introduce the panel topic and structure. In responding to the questions, each panelist will articulate his or her own world view on this topic and how it has informed his or her research. The chair will conclude the formal part of the panel with a high level summary of the different perspectives. The floor will then be open for discussion.

Tutorials

Session M2.6
Monday, 10:30–12:00 noon
Plaza 6

Developing Internet Agents: A Tutorial Using Visual Basic 6.0, Gove N. Allen, University of Minnesota, and Salvatore T. March, Vanderbilt University

An agent is someone or something authorized to “act on behalf of” another person. In professional sports, for example, an athlete’s agent may be authorized to negotiate the athlete’s contract, but may or may not be authorized to accept the terms of a contract. Similarly, an Internet agent acts on behalf of a person who wishes to conduct some activity utilizing the Internet. The capabilities and authority invested in such an agent are at the discretion of the person it represents. Typically Internet agents perform search and data collection activities. They may or may not have authority to negotiate or conduct purchase or sale transactions.

Internet agents have varying levels of sophistication including lifespan, error detection and recovery, data validation, and embedded intelligence (Kauffman et al. 1999). A simple Internet agent, for example, may contact a single Web site (e.g., Amazon.com), extract a single fact (e.g., the price of a specified book) and report that fact to the user. A more sophisticated Internet agent may contact multiple Web sites (e.g., Amazon.com and BarnesAndNoble.com), track facts for several days or weeks (e.g., prices of a basket of books), record those facts for later analysis (e.g., in a database), and conduct transactions (e.g., purchase a subset of the basket of books when prices and availability meet given criteria).

Today’s component-based, rapid application development environments allow individuals with very limited programming experience to build relatively sophisticated Internet agents without lengthy courses in Internet protocols or advanced programming techniques. Using development environments such as Visual Basic 6.0, simple but non-trivial Internet agents can be specified using a handful of components and a few dozen lines of code.

The following sections present a single example illustrating the most rudimentary capabilities needed to create an Internet agent. This agent merely retrieves the raw HTML from a specified URL. A more complete tutorial, available at <http://www.internet-technology.org/> includes examples of more sophisticated agents having more useful capabilities. These include following links, extracting and interpreting the data, and storing that data in a database for later analysis.

Session T2.6
Tuesday, 10:30 a.m.–12:00 noon
Plaza 6

Web-Based Data Collection for the Analysis of Hidden Relationships (Web Mining of Hypertext Links), Edna Reid, Nanyang Technological University

What segments of the global virtual communities are interested in your enterprise’s or competitor’s website? Are they threats and/or opportunities? What are they saying?

With the proliferation of e-businesses, our current array of research tools need to harness and exploit the rich content provided in virtual community resources such as web hypertext linkage data, online text, online advertisements, and consumer-generated information. Online texts, including computer-mediated communication (CMC), such as those found in a myriad of web sites, are being analyzed for patterns among the sites and between the words or phrases on those sites.

According to some scholars, CMC data can be used to generate cognitive maps, identify networks of people who share similar conceptual orientations, and diffuse new ideas or innovations. The techniques of web mining hypertext links and online sociometric analyses are also being used to explore trends, social networking, diffusion, and competitive analyses.

Except for a few studies, web linkage analysis has not been fully exploited by the business community. Fuld and Company, a well-known competitive intelligence enterprise, and AstraZeneca International, a leading pharmaceutical enterprise, are using web hypertext link data for competitive analysis.

Kessler, a manager at Fuld, suggested the use of hypertext links as indicators of official and unofficial relationships. In conducting a business intelligence project, she needed information about a small subsidiary of a large service sector enterprise. Although limited information was available from the subsidiary’s web site, she found incoming hypertext links from a federal and a state government web site. The hypertext links (aka “reverse links”) revealed a signal that the subsidiary participates in government discount programs.

To perform “reverse link,” for example, one can go to the HotBot site (www.hotbot.com), change the drop-down box default from “all the words” to “links to this URL” and type in the specific URL. The result will indicate what web sites have hypertext links to the specified URL, which can then be used in the analysis of who is citing whom via the web.

Rousseau, a bibliometric scholar, used the term “situation” to designate this relation between sites on the Internet. The interest is not the number of links that are found on a given web page, but in the number of times to which a given web page is referred.

This tutorial will present an analytical framework and five-step process for exploiting hypertext linkage data. The process facilitates a variety of e-business research as well as provides the capability of discovering hidden relationships. In addition to explaining the process, the tutorial will demonstrate how the technique was applied to a case study of Microstrategy, Inc., a provider of business intelligence software (www.microstrategy.com).

For Microstrategy, there were 1,154 links to their web site. This presentation will summarize the results of analyzing 1,154 links and outline a framework for facilitating virtual community research that anchors on technological trends, industry mapping, online citations, Porter's Competitive Forces, and competitive intelligence (CI). The application of the framework can generate results similar to the CI services provided by online ad enterprises that allow e-business managers to see where their competitors place online ads, who they reach, and the content of the ads.

Session T3.6
Tuesday, 2:00 p.m.–3:30 p.m.
Plaza 6

Partial Least Squares for IS Researchers: An Overview and Presentation of Recent Advances Using the PLS Approach, Wynne Chin, University of Houston

Structural equations modeling (i.e., causal modeling) is rapidly becoming a predominate technique for analyzing data among IS researchers. Among those researchers using the causal modeling approaches, the covariance based technique as exemplified by LISREL is the more widely known

and employed. It is argued that the lesser known technique of Partial Least Squares (PLS) can often be more appropriate for researchers and has been used more frequently by IS researchers in the past few years.

PLS is well-suited if your research involves multiple indicators of latent variables or constructs, if you wish to account for measurement error among the indicators, and if you wish to estimate the reliability and validity of these measurements within the context of your theoretical model. Finally, PLS comes to the fore if you are faced with data conditions that preclude the necessary conditions for using LISREL (i.e., non-normality and smaller sample size) and would like to create construct scores for predictive purposes.

The objective of the tutorial is to present a state of the art overview of the partial least squares method and position it among other analytic techniques as well as within IS research. Furthermore, this tutorial will highlight the philosophical and operational issues that should be considered when employing causal modeling.

Attendees of this session should come away with the following:

- an understanding of where PLS stands in relation to other multivariate techniques.
- an understanding of the conditions when PLS is appropriate for analyses.
- an understanding of causal diagrams.
- the general algorithm by which PLS generates its results and implications for sample size, data distributions, and epistemological relationships between measures and concepts.
- how PLS and LISREL compare and compliment one another.
- how to assess and report PLS analysis including statistical resampling using jackknifing, bootstrapping, and blindfolding.
- recent advances including modeling second order factors, interaction effects, and multi-group comparisons.
- a demonstration of the PLS-Graph software package for interactive PLS analyses.

Teaching Cases

Session M4.6
Monday, 4:00 p.m.–5:30 p.m.
Plaza 1

SCMP.com: Strategic Repositioning of a Newspaper, Ali Farhoomand and Eva Kwan, City University of Hong Kong

In 1996, the *South China Morning Post* (SCMP), a Hong Kong-based English-language news daily, established PostNet (an electronic publishing division) to experiment with the on-line medium. In mid-1999, SCMP's Board of Directors observed the Internet's meteoric rise and considered PostNet's

e-commerce opportunity. In order to leverage e-commerce's growth, they resolved to reposition the SCMP from a print-based publisher to a company capable of multi-media publishing. PostNet was renamed SCMP.com.

To be successful in this endeavour, the SCMP had to overcome numerous problems, including the need to build a viable business model, to streamline internal workflows, to transform the mindset of the employees and to search for the "right" strategic partners to strengthen its on-line network. In addition, the SCMP would be required to decide whether or not to spin off SCMP.com (or any other part of its Internet capable business) into an independent concern.

EIU's ViewsWire: New Wine in a New Bottle, Peter Lovelock and Ali F. Farhoomand, City University of Hong Kong

On May 1, 1998, the Economist Intelligence Unit (EIU) launched its new Web-based information service, *ViewsWire*. *ViewsWire* was an attempt to take advantage of the Internet by combining the resources of the Economist Group's information services and publishing skills with cutting-edge search-and-retrieval technology and a proprietary database system. By linking related stories, articles, and briefings together, the aim was to allow *ViewsWire* users to create their own "personalized decision-support profiles."

Moreover, global executives—the service's target audience—would be able to log on to *ViewsWire* via the Internet from their desktops, their home PCs, or their laptops, to demand and retrieve the information that they needed—background briefings or up-to-date news—anytime, anywhere. In other words, *ViewsWire* promised to be a publishing service that did away with publishing schedules.

To successfully produce *ViewsWire*, however, required the EIU to reengineer how it organized information internally and how it coordinated that process across more than 500 editors and analysts in more than 100 countries, working to a variety of different formats and timelines. Was it possible to create a new information product for the Web, based on a global intranet and a worldwide resource of information

gatherers? What was the best means of implementing the new structure, and how could it be integrated into the existing work practices? How could a publishing company do away with publishing schedules and deliver information in Internet time?

Session T2.2

Tuesday, 10:30 a.m.–12:00 noon
Plaza 2

NIBCO's "Big Bang," Carol V. Brown and Iris Vessey, Indiana University

NIBCO, Inc., a mid-sized manufacturer of valves and pipe fittings headquartered in the U.S. with \$460 million annual revenues, implemented SAP R/3 across its 10 plants and four distribution centers with a Big Bang approach in December 1997. NIBCO management agreed with the Boston Consulting Group recommendation to "cut loose" from its existing legacy systems and

replace them with common, integrated systems for finance, materials management, production, and sales/distribution, such as offered in the ERP packages of major vendors by the second half of the 1990s. However, the company leaders chose not to heed the advice of their consultants, or the current trade press, about taking a slower, phased-in approach. Instead, they developed plans for a Big Bang implementation of all modules (except HR) with a \$17 million budget and a project completion date 15 months later that allowed for only a 30 day grace period.

The project is led by a triad of NIBCO managers with primary accountabilities for business process, IT, and change management. The case describes the legacy IT environment, the ERP purchase and implementation partner choices, the selection and composition of what came to be called the TIGER team, the workspace design for the project team (TIGER den), the key issues addressed by each project sub-team, the incentive scheme, and the complexity added by a distribution center consolidation initiative that runs behind schedule. The case story ends shortly after the Go Live date, with the project leaders replaying their warnings to the executive team about initial dips in productivity and profits.

This case study can be used to demonstrate the tradeoffs between Big Bang versus slower ERP implementation approaches that allow time for organizational learning. Students can identify the technology and organizational risks associated with ERP projects in general, and Big Bang implementations in particular, and then assess how well NIBCO's leaders manage these risks over the life of the project. Specific examples of communications and training initiatives, including ways to achieve employee buy-in, are detailed in the case so that students can better understand change management practices in the context of a major system implementation. The teaching note includes an epilogue, a framework for analyzing the implementation approach, a teaching guide, and supplementary references.

Managing Global Information Strategy: Xerox, Ltd., Philip Seltsikas, Brunel University

The diversity of information management (IM) issues and problems that a large multinational company may face are illustrated by showing how Xerox Ltd. managed its IM strategy over a ten-year period. The case study details the IM developments and shows how the Xerox IM team managed by focusing on a six-pronged strategy: business processes, data and information, applications, technology, organization, and human resources. The problems that Xerox faced in each of these areas are discussed and management's approach to resolving them is described. In essence, Xerox's move to managing-by-process required matching changes in IM capability to support it. Xerox's earlier approach, which entailed a decentralized IS model, became inadequate for supporting the dynamic process model, and ultimately customer needs. The case then shows how the process model became heavily reliant on the capabilities offered by IM. As business processes and information systems became increasingly intertwined, Xerox aligned the development of both models and effectively brought their management and coordination together. A centralization strategy was key to bringing these latter changes about.

Session W1.5

Wednesday, 8:30 a.m.–10:00 a.m.
Plaza 2

Knowledge Management at Ernst & Young UK: Getting Value Through Knowledge Flows, Jean-Noël Ezingeard, Henley Management College, Simon Leigh, Ernst & Young, and Rebecca Chandler-Wilde, Henley Management College

This case study looks at knowledge management (KM) at Ernst & Young UK (E&Y UK), at the end of 1999/beginning of 2000. The case describes the business processes to be supported by

KM in a professional services firm, and E&Y UK's efforts in developing a robust Knowledge Management system that can deliver value.

The case describes the electronic resources in place, the key processes and the key roles played by people in E&Y's knowledge management efforts. It concludes by asking how the system should be further developed in the light of the decision to globalize KM in the organization.

The LEGO Interactive Teaching Case: Direct Consumer Access, Rikke Orngreen, Copenhagen Business School

The LEGO Company has one of the most successful Internet sites in the world targeted primarily at children, namely the www.lego.com website. In early 1999 the LEGO Company also launched a website for selling LEGO products over the Internet. This site is called the LEGO World Shop. The emergence of those two sites, from the first idea to the implementation and administration of the sites, are covered in the interactive teaching case described in this paper. The objective is to let the users of the case be submerged into the "LEGO world" by playing the role of a consultant. The consultant has the task of evaluating the current Internet strategy chosen by the LEGO company and advising management about future possibilities regarding electronic commerce. This paper presents the case, describing first the background information, then the case story and learning objectives of the case. This is followed by a presentation of the user interface, enriched with illustrations providing a realistic feeling of the actual case. Finally, an overview of the material available in the interactive case is given.

ICIS 2000 Sponsors

ACM Special Interest Group on Management Information Systems (SIGMIS)

Air New Zealand

Association for Information Systems (AIS)

The Australian Internet Architecture Network

Dell Computer Corporation

Dialog Information Technology

Gartner Group

Department of Computer Information Systems, Georgia State University

Information Systems Research Center, University of Houston

INFORMS Information Systems Society

BDO Kendalls Business Intelligence

Lonely Planet

Center for Virtual Organizations and Commerce, Louisiana State University

Center for Information Systems Research, Massachusetts Institute of Technology

Center for MIS Studies, University of Oklahoma

Oracle

The University of Queensland Business School

Society for Information Management (SIM)

A. B. Freeman School of Business, Tulane University