INFORMS

Volume 11, Number 1

Fall 2005

TECHNOLOGY MANAGEMENT SECTION

http://tms.section.informs.org

Published by *TMS* for its fall academic meeting

From the Chair's Desk

— Diane Bailey

This fall, we witnessed the destruction and despair wrought by Hurricanes Katrina and Rita. We extend our heartfelt condolences to the victims of these storms. We are sorry to miss seeing our friends and section members in New Orleans for this year's annual meeting, but hope that many of you will be able to join us in the relocated site, San Francisco.

Our section's vibrancy is reflected this year in the excellent slate of sessions and talks for the annual meeting. With topics ranging from knowledge transfer to technology strategy to DEA, the program speaks to the diversity of interests within our section. We thank Sebastian Fixson for his superb efforts in putting together this program.

I'd like to draw particular attention to the slate of four sessions in this year's program presented by an emerging group called KLIC, which stands for Knowledge, Learning and Intellectual Capital. At last year's meeting, Charles Weber of KLIC organized two sessions on organizational learning and knowledge management. As the group gained momentum this year, David Moore of KLIC worked with Sebastian to put together a full day's worth of sessions around this topic. We hope that you enjoy them.

The Technology Management Section prides itself on supporting special interest activity of this nature. In 2002, for example, we ran a program in San Jose devoted to technology management from an organizations perspective. That program included sessions on topics such as modern technical work and the role of technology in workplace learning. In the intervening years, we have supported interest in strategy, entrepreneurship and innovation with special sessions. We encourage groups of researchers to propose small clusters of two or more special interest sessions to the TMS officers for inclusion in next year's program. Please contact Francisco Veloso (fveloso@cmu.edu), incoming program chair, with your ideas and questions before the end of this year.

We have also continued to work on building bridges with the New Product Development cluster, whose topics are of great interest to many of our members. This year, we are delighted to hold a joint panel session with NPD entitled, "How Organization Science Should Influence New Product Development & Management of Innovation Research." Chaired by Ed Anderson, this Monday panel will feature Linda Argote, Andrew Henderson, Riitta Katila, and Margaret Peteraf. The complete NPD program in also included in this newsletter.

Our distinguished speaker session will be jointly held with NPD this year. Our speaker, Eric von Hippel, is head of the Innovation and Entrepreneurship Group at the MIT Sloan School of Management. Professor von Hippel will be speaking on the topic of his new book, *Democratizing Innovation* (see more details on p. 2). We look forward to Eric's talk, to be held on Monday of

(Continued on page 19)

SAN FRANCISCO BUSINESS MEETING

The Technology Management Section business meeting will be held on Monday, November 14, 18h15 - 19h15. A wine and cheese reception will follow and you will get to meet with the TMS officers and other distinguished colleagues. Don't miss this networking opportunity!

IN THIS ISSUE

Democratizing Innovation

by

Eric von Hippel

The TMS/NPD Distinguished Speaker

— Sarfraz Mian

Innovation is being democratized. Users, aided by improvements in computer and communications technology, increasingly can develop their own new products and services. User innovation, the data show, is strongly concentrated among "lead users." These lead users--both individuals and firms--often freely share their innovations with others, creating user-innovation communities and a rich intellectual commons. The trend toward democratized innovation is visible both in information products like software and also in physical products. Lead user innovation provides a valuable feedstock for manufacturer innovation, and produces an increase in social welfare relative to a manufacturer-only innovation system. Freely-revealed innovations by users forms the basis for a user-centric innovation system that is so robust that it is actually driving manufacturers out of product design in some fields. This presentation will suggest ways that manufacturers can redesign their innovation processes to adapt to newly-emerging user-centric innovation systems. Likewise, it will defend that changes should also be made to governmental legislation and policies, including the Digital Millennium Copyright Act, that may inflict "collateral damage" on user innovation. The emergence of democratized innovation systems will be disruptive to some. But, as the talk will show, the end result is worth striving for.

Eric von Hippel is Professor and Head of the Technological Innovation and Entrepreneurship Group at the MIT Sloan School of Management. He is a graduate of Harvard College (BA), MIT (MS) and Carnegie Mellon University (PhD). He is a recipient of an honorary doctorate from Ludwig-Maximillians Universität München, has been a Fellow at the Candadian Institute for Advanced Research, has served as Sir Walther Scott Distinguished Professor at UNSW in Australia. He has founded and participated in startup firms, and is a founder of the entrepreneurship program at MIT. He serves on numerous editorial advisory boards for academic journals. von Hippel is a very active researcher with numerous international collaborators. He is the author of many academic and business publications. His most recent book is *Democratizing Innovation*, MIT Press, 2005.

von Hippel's academic research examines the sources of and economics of innovation. He is known for pioneering research that has shown how product "lead users" are often the developers of successful new products – rather than manufacturers as has been commonly assumed. This research, along with that of collaborators and others, is now triggering a major rethinking of how the innovation process really works. The emerging view that users are at the center of the innovation process promises to trigger major changes in firm business models and also in government policymaking on innovation-related matters.

von Hippel has also developed practical tools that enable product manufacturers to more efficiently participate in user-centered innovation processes. User-based innovation methods such as lead user search processes and toolkits for user innovation are now being used by many firms worldwide.

TMS Doctoral Dissertation Award 2005 Winner is Dovev Lavie

The Two Runner-Ups are Oana Branzei and Marc Junkunc

— Moren Lévesque

The 2005 TMS Best Doctoral Dissertation Award was announced this year in June. The winner is Dovev Lavie for his dissertation entitled "The interconnected firm: Evolution, strategy, and performance." The dissertation was completed in June 2004 at the Wharton School, University of Pennsylvania. Dovev is now an Assistant Professor at the McCombs School of Business, University of Texas at Austin.

The two runner-ups for this award are Oana Branzei for her dissertation entitled "Product innovation in heterogeneous R&D networks: Pathways to exploration and exploitation" and Marc Junkunc for his dissertation entitled "Toward a greater economic understanding of entrepreneurial activity: Examining the nature and importance of specialized knowledge." Oana, who is now Assistant Professor at the Schulich School of Business at York University, completed her dissertation in December 2004 at the Sauder School of Business, University of British Columbia. Marc, who is now an Assistant Professor at the School of Business Administration at the University of Miami, completed his dissertation in April 2004 at the Anderson School of Management, University of California – Los Angeles.

Congratulations to our three recipients. In recognition of their achievement, Dovev, Oana and Marc have been invited to present a talk based on their dissertation at the San Francisco Meeting. The session is scheduled for Monday November 14, 10:00am-11:30am. We look forward to hearing their presentation. Our recipients will all receive a check and a plaque from TMS.

We would like to thank the reviewers who evaluated the dissertation submitted this year: David Deeds from the University of Texas at Dallas, Elicia Maine from Simon Fraser University, Corinne Post from Pace University, Julie Rennecker from Case Western Reserve University, Charles Weber from Portland State University, and Arvids Ziedonis from the University of Michigan. TMS officer Moren Lévesque from Case Western Reserve University coordinated the review process.

A Retrospective Look at the Last 3 years of TMS Programs

— Francisco Veloso

The Identity of the Sections and Colleges of Informs is very much defined by the content of the sessions they sponsor. So, we decided to look at the TMS programs from 2002-2004 and identify some of the patterns and evolution of the sessions.

Three major themes dominate the programs. The first, with six sessions organized over these last three years are issues in the frontier between technology, organizations and knowledge, including learning. In fact, given the relevance of the topic in last programs, it is not surprising to see the 2005 sessions in this area under a common umbrella that a group of members has now organized — KLIC. A second area of focus has been technology strategy. Five sessions have been organized focusing on this topic, which is again present in this year's program. The third area of interest, also with five sessions since 2002, has been entrepreneurship and new venture formation, including university technology transfer.

Workforce and Teams is another topic present in TMS since 2002. Every year we have had a session focusing on these topics. The Management of Research, Development and Engineering, not surprisingly, has also had a session consistently devoted to it. Another regular pattern of the program has been sessions jointly sponsored with the New Product Development group, or focusing on topics of interest to the two communities. This collaboration has been expanded this year, with two joint sessions.

Two other features have become TMS markings. The first is the presence of a distinguished speaker. In the last three years we had Stephen Barley talking about work in a post-industrial, knowledge intensive world, William Halal discussing Technological Forecasting and Strategy, and Scott Shane focusing on Entrepreneurship. TMS has also given the opportunity for a new generation of promising scholars to come every year and present their work as part of the session Best Dissertation Award.

We also organized two Panels, one focusing on Engineering management Education and Research and the another with editors of some of the top journals in the field talking about publishing high quality research. Finally, there have also been a number of other sessions on various topics, ranging from patenting, technology entry and diffusion or need for speed on technology management.

INFORMS -Technology Management Section
San Francisco, CA, '05
Sponsored/Invited Program
(November 13 - 16, Sun-Wed)

— Sebastian Fixson

Dear TMS members,

This year's TMS sponsored cluster program features more than 48 individual presentations and two panels in the area of Technology Management, Innovation, and Entrepreneurship. Ten regular paper sessions are complemented with presentations of the 2005 TMS Distinguished Speaker, Dr. Eric von Hippel, Professor and Head of the Innovation and Entrepreneurship Group at the MIT Sloan School of Management, and the 2005 winner of the TMS Best Dissertation Award, Dr. Dovev Lavie, of McCombs School of Business, University of Texas – Austin. Continuing a longstanding tradition, our program also includes a session jointly hosted with the New Product Development (NPD) cluster. This year, it features a panel discussion titled "How Organization Science should influence New Product Development & Management of Innovation Research." Our program concludes with a panel on technology management education and research aspects. We hope you find the program interesting, and participate in presentations and discussions.

On the first day of the program, *Sunday, November 13*, the program starts with a TMS-first. Four consecutive sessions are presented as a mini-cluster, organized by the interest group Knowledge, Learning, & Intellectual Capital (KLIC). The opening session focuses on individual-organizational linkages, for example with agent-based social simulations and dynamic models of transactive memory systems. The second session turns to fundamental models and processes such as functional structures and causal graphs. The presentations in the third session investigate mechanisms and management of knowledge transfer. The day concludes with the fourth KLIC session which zooms in on organizing for learning by presenting, among others, empirical and model-based work in the airline and motor sports (NASCAR) industries.

Monday, November 14, starts of with a session on modeling and application work using the Design Structure Matrix (DSM). The second session presents this year's winner of the TMS Best Dissertation Award, Dr. Dovev Lavie of the University of Texas-Austin, and two runner-ups, Dr. Oana Branzei of York University, and Dr. Marc Junkunc of the University of Miami. The third session of the day features a panel discussion on how organization science should influence research in new product development and innovation management. This session is co-hosted with the New Product Development Cluster. The fourth session on Monday is traditionally devoted to the TMS distinguished speaker. This year, we are proud to present Dr. Eric von Hippel of the MIT Sloan School of Management who will talk about his new book "Democratizing Innovation." We will hold the TMS business meeting directly after Dr. von Hippel's talk. Please join us for news, updates, and refreshments.

The third day, *Tuesday, November 15*, begins with a session on engineering and technology management, presenting work on innovation and efficiencies in supply chains. The second session includes work on technology strategy and global competition, discussing, for example, risk assessment of emerging technologies and technology development paths shifts caused through offshoring. The third and fourth sessions of the day focus on the topic entrepreneurship. Presentations in the third session investigate decisions relevant for entrepreneurs and the aggregate effect of entrepreneurs on the economy from a macro-perspective. The fourth session adds modeling and experimental work on decision processes and the role of characteristics of entrepreneurs.

The fourth day of our program, *Wednesday, November 16*, 2005, starts with a session on management applications of data envelope analysis. Applications range from fighter jets to the construction industry. Our program concludes with the second session of the day which features a panel discussion of the engineering and technology management education and research council.

Due to the related content and the great overlap of people interested in either cluster, we have developed the TMS conference program in close coordination with the New Product Development (NPD) cluster. Consequently, we also publish the entire NPD program in this newsletter. You find it immediately after the TMS program.

We are looking forward to this year's conference and hope to see many of you in San Francisco!

Sunday, November 13th

SA19 08h00 - 09h30 KLIC I -- Individual-Organizational Linkages (Knowledge, Learning & Intellectual Capital)

Chair: **Charles Weber**, Assistant Professor, Portland State University, Post Office Box 751, Department of Engineering and Technology, Portland OR 97207-0751, United States, charles.weber@etm.pdx.edu

P1. *Characterizing the Value-Driven Learning Curve* . **Charles Weber**, Assistant Professor, Portland State University, Post Office Box 751, Department of Engineering and Technology, Portland OR 97207-0751, United States, charles.weber@etm.pdx.edu

Abstract: The traditional cost-driven learning curve does not satisfactorily explain many high tech organizational learning phenomena such as learning high-velocity environments (Eisenhart & Bourgeois) learning before doing (Pisano), yield-driven learning, (Bohn & Terwiesch) learning while ramping (Terwiesch & Bohn), designing for learning, platform leadership (Gawer & Cusumano) and increasing returns (Arthur). A promising value-based alternative is presented.

P2. *Agent-based Social Simulation in Organizational Learning: A Micro Perspective.* **Brent Capps-Zenobia**, Ph.D. Student, Portland State University - ETM, bcapps@hevanet.com. **Charles Weber**, Assistant Professor, Portland State University, Post Office Box 751, Department of Engineering and Technology, Portland OR 97207-0751, United States, charles.weber@etm.pdx.edu
Abstract: Historically, organizational learning has focused on the macro-perspective (learning curve, Lotka-Volterra equations). The point of view of the individual has not been discussed exhaustively. Agent-based social simulation, an approach in which human behavior is simulated by automata, presents itself as an alternative. A case from innovation adoption is presented.

P3. *A Dynamic Model of Transactive Memory Systems.* **Edward Anderson**, University of Texas at Austin Business School, McCombs School of Business, 1 University Station B6500, Austin TX 78733, United States, Edward.Anderson@mccombs.utexas.edu, **Kyle Lewis**, Asst. Professor, University of Texas, McCombs School of Business, 1 University Station B6300, Austin TX 78712, United States, Kyle.Lewis@mccombs.utexas.edu
Abstract: A key determinant of any product development group's performance is its transactive memory system (TMS): its shared, tacit memory system for managing and communicating information relevant to the group. We build a system dynamics model relating TMS to productivity by leveraging the theory of learning-by-doing at both the group and individual levels. We also include the effects of "group forgetting," specialization, and knowledge obsolescence.

P4. *Individual-Organization Link and Knowledge.* **Teppo Felin**, Visiting Assistant Professor, Emory, 1300 Clifton Road, Atlanta GA 30322, United States, teppo_felin@bus.emory.edu, **William Hesterly**, Professor, University of Utah, David Eccles School of Business, Salt Lake City UT 84112, United States, mgtwh@business.utah.edu
Abstract: In this paper we address the individual-organization link as it relates to knowledge, and we explicate the problem of transformation between levels. Specifically - how, when, and why can we meaningfully talk about organizational knowledge? We also address some of the fallacies associated with specifying the organization as the repository knowledge and move toward explicating the underlying theoretical mechanisms and micro-foundations. Finally we outline critical future directions related to the micro-macro link for knowledge-based work in organization science.

SB19 10:00 - 11:30 KLIC II -- Fundamental Models and Processes

Chair: **David Moore**, Assistant Professor, Colorado School of Mines, Economics and Business Division, 814 15th Street, Golden CO 80401, United States, dmoore@mines.edu

P1. *Linking Learning Services with Business Processes: The Strategic Value of Learning*. **Thomas Hill**, Director, Learning and Knowledge Management, Genetech, 1 DNA Way, South San Francisco CA 94080-4990, United States, hill.thomas@gene.com
Abstract: This work analyzes the programs of companies like Shell, Reuters, HP and Genentech in moving learning from an event orientation to a process one, showing the linkages of learning services to business processes, alignment with corporate business processes and finally positioning and evaluating learning based on strategic business impact.

P2. *Production Functional Structures of Additive Production Performance Metrics*, **David Moore**, Assistant Professor, Colorado School of Mines, Economics and Business Division, 814 15th Street, Golden CO 80401, United States, dmoore@mines.edu
Abstract: Existence of additive decompositions of performance metrics such as cycle time, throughput, cost and yield as posited by (Zhangwill and Kantor) will be demonstrated in a production economic framework. We characterize all functional representations of production technologies having performance metrics with additive decompositions, and present empirical tests verifying, and apriori technological conditions implying existence of additive decompositions.

P3. *Prior Knowledge in the Learning Curve: An Exploration of Form and Function*. **Nile Hatch**, Marriott School - BYU, 790 TNRB, Provo UT 84602, United States, nile@byu.edu Stefan **Reichelstein**, Stanford University, Stanford CA, United States, reichelstein_stefan@gsb.stanford.edu
Abstract: t is common to assume that the cost of the first unit is a control for the level knowledge at the beginning of a learning curve. We show that the shape and rate of learning depends on the level of prior knowledge and that the cost of the first unit does not control for this knowledge. We propose a functional form that controls for prior learning and test its performance in estimating learning curves in semiconductor manufacturing.

P4. *Evolving Backwards: Technological Knowledge as a Causal Graph*, **Roger Bohn**, Professor, UC San Diego, 9500 Gilman Drive, MC 0519, La Jolla CA 92093, United States, Rbohn@UCSD.edu
Abstract: Technological knowledge can be modeled as a causal knowledge graph (CKG). In this model, knowledge tends to evolve backwards over time, from effect to cause. 200 years of firearms manufacturing at Beretta provide the main example. Strengths and limits of the CKG will be sketched. Among other features, CKGs can be used directly by engineers to learn about, store, and combine knowledge. CKGs and their evolution explain society-wide organization of technological knowledge into firms.

SC19 13:30 - 15:00 KLIC III -- Knowledge Transfer Decision Support

Chair: **David Moore**, Assistant Professor, Colorado School of Mines, Economics and Business Division, 814 15th Street, Golden CO 80401, United States, dmoore@mines.edu

P1. *Managing Employee Knowledge through External Knowledge Transfer and Learning-by-Doing*, **Cheryl Gaimon**, Regents Professor, Georgia Institute of Technology, 800 West Peachtree St. NW, Atlanta GA, United States, cheryl.gaimon@mgt.gatech.edu, **Gulru Ozkan**, PhD student, College of Management, Georgia Institute of Technology, Atlanta GA 30332-0520, United States, gulru.ozkan@mgt.gatech.edu
Abstract: We consider the situation where employee training is needed. We analyze dynamic strategies pursued by a firm that increases employee knowledge through learning-by-doing

(internal source of knowledge creation) and by hiring consultants (external source for knowledge transfer). Key issues we address include the appropriate duration of consultancy engagement, the rate of pursuit in knowledge transfer, and the effect of learning-by-doing on the knowledge transfer process.

P2. *The Economics of Speed*. **Rob Leachman**, Professor, University of California, Berkeley, 4135 Etcheverry Hall, Berkeley CA 94720-1777, United States, leachman@ieor.berkeley.edu, **Shengwei Ding**, University of California at Berkeley, 4135 Etcheverry Hall, Berkeley CA 94720-1777, United States, dingsw@ieor.berkeley.edu
Abstract: A delay cost model is introduced that quantitatively assesses revenue gains resulting from increased speed of manufacturing deployment and execution. Costs of projects or investments that increase speed may be weighed against revenue gains calculated using the model. The model is demonstrated on semiconductor industry data.

P3. *Targeted Knowledge Transfer and Accelerated Organizational Learning*. **David Moore**, Assistant Professor, Colorado School of Mines, Economics and Business Division, 814 15th Street, Golden CO 80401, United States, dmoore@mines.edu
Abstract: The functional structure of production technologies having additively decomposable performance metrics may be exploited to accelerate learning. We present a general mathematical and economic framework for identifying productivity-enhancing knowledge transfer opportunities and evaluating the potential economic impact of successful knowledge transfer. Efficient data collection and analysis strategies, and differences between input-reducing and output-expanding learning will be highlighted.

P4. *The Effect of Information Technology on Organizational Learning and Knowledge Transfer*. **Linda Argote**, Professor, Carnegie Mellon University, Tepper School of Business, 5000 Forbes Ave., Pittsburgh PA 15213, United States, argote@andrew.cmu.edu, **Michael J. Ashworth**, Doctoral Candidate in Computational Organization Science, Carnegie Mellon University, School of Computer Science, ashworth@cmu.edu, **Tridas Mukhopadhyay**, Professor, Carnegie Mellon University, Tepper School of Business, tridas@andrew.cmu.edu
Abstract: We examine whether information technology affects organizational learning and knowledge transfer. We conducted an analysis of monthly data spanning five years at six financial institutions. Information technology was found to have a positive impact on productivity and quality as well as increase the rates at which the units improve their productivity and quality with experience. Information technology significantly enhances the transfer of productivity-enhancing knowledge.

SD19 16:30 - 18:00 KLIC IV -- Organizing for Learning (Knowledge, Learning and Intellectual Capital)

Chair: **Nile Hatch**, Marriott School - BYU, 790 TNRB, Provo UT 84602, United States, nile@byu.edu

P1. Managing Customer Outrage: Focus Organizational Learning Efforts on Service Failure or Recovery? **Michael Lapre**, Vanderbilt University, Owen Graduate School of Management, 401 21st Avenue South, Nashville TN 37203, United States, michael.lapre@owen.vanderbilt.edu
Abstract: Firms must be prepared to recover from service failures to turn angry customers into loyal customers. Using mishandled-baggage data for 9 major US airlines over 11 years, I find that dissatisfaction with recovery contributes 88% to the variation in customer outrage, whereas service failure contributes only 12%. A U-shaped learning-curve effect and heterogeneity in learning curves are more important for recovery than for service failure. Hence, firms should pay more attention to service recovery.

P3. *Towards a Behavioral Theory of Core-Periphery Evolution in Networks: A Model Based Analysis*. **Nitin Joglekar**,BU School of Management, 595 Commonwealth Avenue, Boston MA, United States, joglekar@bu.edu, **N. Venkatraman**, Boston University School of Management, 595 Commonwealth Avenue, Boston MA 02215, venkat@bu.edu
Abstract: We model the evolution of the core and the periphery of a social-network by extending the tenets of firm level behavioral decision making (i.e. target setting, expectations and choices that guide organizational learning) into network level constructs: embeddedness and interdependence. Our results document the efficacy of exploration and exploitation heuristics for building positional advantage and illustrate that performance of these heuristics is crucially affected by behavioral biases.

P3. *Organizing for Innovation in the Motor Sports (NASCAR) Industry Cluster in Charlotte, NC.* **Carlos Martinez-Vela**, MIT, 292 Main St, E38-104, Cambridge MA 02139, United States, camv@mit.edu
Abstract: In this case study I examine how NASCAR teams located in Charlotte, NC integrate knowledge to innovate and coordinate change. I find that integration is a social process that occurs when product development teams can initiate and sustain collaboration and conversations across occupational and organizational boundaries. I illustrate how NASCAR teams organize this process and propose a grounded theory model for organizing innovation and integration.

P4. *Managerial Knowledge, Learning, and Intellectual Capital.* **Margaret Peteraf**, Professor, Tuck School of Business, Dartmouth, 100 Tuck Hall, Hanover NH 03755, United States, margaret.a.peteraf@dartmouth.edu, **Mark Shanley**, Professor, Purdue University, Krannert Graduate School of Management, Purdue University, West Lafayette IN 47907, United States, shanleym@mgmt.purdue.edu
Abstract: Managerial knowledge is a resource for firms. At the same time, the accumulation and deployment of that knowledge constitutes an important organizational capability. Coming to grips with a resource and capability set that is part of the entire firm's resource configuration and yet determines that configuration and how it evolves is a major task for theory development.

Monday, November 14th

MA19 08:00 - 09:30 Exploring Product and Process Architecture with the Design Structure Matrix

Chair: **Tyson Browning**, Assist. Prof. of Enterprise Operations, TCU Neeley School of Business, TCU Box 298530, Fort Worth TX 76129, United States, t.browning@tcu.edu

P1. *Exploring the Architecture of Complex Software Products.* **Alan MacCormack**, Harvard Business School, Boston MA, United States, amaccormack@hbs.edu
Abstract: We use Design Structure Matrices to analyze a number of different software products and define metrics that allow us to compare the architectures of these products at the system level. Our results reveal significant differences in modularity consistent with a view that the degree of modularity may be

associated with different organizational designs. We also find evidence that purposeful redesign efforts can have a significant impact on modularity, even for reasonably complex designs.

P2. *Component Modularity, Structural Holes, and the Attendance to Technical Interdependences*. **Manuel Sosa**, Assistant Professor of Technology and Operations Management, INSEAD, Boulevard de Constance, Fontainebleau 77300, France, manuel.sosa@insead.edu
Abstract: We study how both product and organizational network structures impact the capacity of teams to coordinate their technical interdependences. We found that both component modularity and spanning structural holes increase the capacity of teams to attend interdependences. Yet, the effects of structural holes are moderated by component redesign.

P3. *Projects with Sequential Iteration: Models and Complexity.* **Janice Carrillo**, Assistant Professor, University of Florida, PO Box 117169, Gainesville FL 32611-7169, United States, janice.carrillo@cba.ufl.edu, **Anand Paul**, University of Florida, PO Box 117169, Gainesville FL, paulaa@ufl.edu
Abstract: We analyze the Design Structure Matrix (DSM) problem and establish an integer programming formulation. Because of the complex nature of this problem, several simplified models are proposed and analyzed. Numerical analysis of the original DSM problem and heuristic approaches shows that relatively good solutions can be easily obtained, thereby offering managers efficient alternative solution approach to the original DSM problem.

P4. *Using the DSM to Model Impact of Rework across Phase Gates in an Early Product Development Process*. **Devadatta Kulkarni**, General Motors Research & Development Center, United States, datta.kulkarni@gm.com
Abstract: A DSM model of the early stages of GM PD process identified opportunities for enhancement. A cross-functional team was interviewed to ascertain their roles and interactions in three early phases of PD. Initially, the process proceeds in a highly serial fashion but becomes highly concurrent and iterative in the last two phases. Simulation-based analysis showed that the major block of tasks straddling the last two phases significantly impacted the total process duration.

MB19 10:00 - 11:30 TMS Best Dissertation Award 2005

Chair: **Moren Levesque**, Assistant Prof. of Entrepreneurship and of Operations, Case Western Reserve University, 10900 Euclid Av., Cleveland OH 44106, USA, mxl101@cwru.edu

Best Dissertation Award to *The Interconnected Firm: Evolution, Strategy, and Performance,* **Dovev Lavie**, Assistant Professor of Management, University of Texas at Austin, 1 University Station B6300, McCombs School of Business, Mgmt. Dep., Austin TX 78712, USA, dovev.lavie@mccombs.utexas.edu
Abstract: This dissertation contests the view that valuable resources must be internally owned by considering rent appropriation via sharing/leakage of network resources. A study of the co-evolution of Unisys and its alliance network shows how shifts in strategy shape the network configuration, while analysis of 20,779 alliances reveals its performance implications, i.e., partners' bargaining power weakens performance, but their capabilities, inter-partner competition, and alliance-type balance enhance it.

Runner-up award to *Product Innovation in Heterogeneous R&D Networks: Pathways to Exploration and Exploitation,* **Oana Branzei**, Assistant Professor, York University, 4700 Keele Street, Toronto ON M3J 1P3, Canada, obranzei@schulich.yorku.ca
Abstract: This thesis examines whether, how, and when heterogeneous alliance networks enable firms to convert external variance into desirable firm-level outcomes. For manufacturing firms, diverse R&D ties engender a broad array of learning capabilities, stimulate both exploratory and exploitative product innovation, trigger new pathways for attaining competitive advantage, and, under specific environmental conditions, either complement or act as a lever for internal capability configurations.

Runner-up Award to *Toward Greater Economic Understanding of Entrepreneurial Activity: Examining Specialized Knowledge*, **Marc Junkunc**, Assistant Professor of Management, University of Miami, School of Business Administration, 5250 University Drive / 417 Jenkins Bldg, Coral Gables FL 33124, USA, mjunkunc@miami.edu
Abstract: I introduce an analytical framework of entrepreneurial activity characterized by specialized knowledge resources in team production. The framework predicts that valuable entrepreneurial activity can fail to occur due to differences in the very specialized knowledge components necessary for innovation. Empirically, I test the notion of entrepreneurial transactions failing (using IPO data) when there are greater degrees of specialized knowledge present, and find substantial supporting evidence.

MC17 13:30 - 15:00 Joint NPD/TMS Panel: How Organization Science should influence New Product Development & Management of Innovation Research

Chairs: **Edward Anderson**, University of Texas at Austin Business School, McCombs School of Business, 1 University Station B6500, Austin TX 78733, United States, Edward.Anderson@mccombs.utexas.edu. **Linda Argote**, Professor, Carnegie Mellon University, Tepper School of Business, 5000 Forbes Ave., Pittsburgh PA 15213, USA, argote@andrew.cmu.edu

Panelists**: Andrew Henderson**, University of Texas, McCombs School of Business, 1 University Station B6300, Austin TX 78712, Andy.Henderson@mccombs.utexas.edu, **Riitta Katila**, Assistant Professor, Stanford University, Dept. of Management Science and Engineering, Terman 413, Stanford CA 94305, rkatila@stanford.edu, **Margaret Peteraf**, Professor, Tuck School of Business, Dartmouth, 100 Tuck Hall, Hanover NH 03755, United States, margaret.a.peteraf@dartmouth.edu
Abstract: The panel of distinguished organization science experts will discuss what they think are under-explored areas of research in the management of technology and product innovation that may be especially fruitful for INFORMS modelers and empiricists to study. Dr. Argote is an expert on learning in organizations; Dr. Henderson on diversification in high-tech environments; Dr. Katila on technology strategy and organizational evolution; and Dr. Peteraf on firm capabilities in dynamic environments.

MD19 16:30 - 18:00 TMS/NPD Distinguished Speaker

Chair: **Sarfraz Mian**, Professor, SUNY Oswego, Oswego NY, United States, mian@Oswego.EDU

Democratizing Innovation. **Eric von Hippel**, Professor, MIT Sloan School, Cambridge MA, USA, evhippel@mit.edu
Abstract: In his lecture, the speaker will argue that innovation is

rapidly becoming democratized. This cutting-edge research on innovation process reveals that lead users, both individuals and firms, aided by improvements in computers and communications technology, increasingly can develop their own new products and services; often sharing the results with others. These freely-revealed innovations by users are forming the basis for a user-centric innovation system.

M 18:15 – 19h15 TMS Business Meeting & Social

Chair: **Diane Bailey**, Stanford University, 428 Terman, Stanford CA 94305-4026, USA diane.bailey@stanford.edu

Tuesday, November 15th

TA19 08:00 - 09:30 Engineering and Technology Management

Chairs: **Pedro Oliveira**, Assistant Professor, School of Economics and Management, Universidade Católica Portuguesa, Palma de Cima, Lisboa 1649-023, Portugal, poliveira@fcee.ucp.pt, **Pedro Ferreira**, Post-Doctoral Fellow, University of California at Berkeley, 770 California #206, San Francisco CA 94108, United States, pedro@sims.berkeley.edu

P1. *Transaction Costs, Capabilities, and Innovation in Value Chains*. **Claudio Wolter**, PhD Student, Carnegie Mellon University, cwolter@andrew.cmu.edu, **Francisco Veloso**, Assistant Professor, Carnegie Mellon University, Engineering & Public Policy, 5000 Forbes Av, Pitts PA 15213, United States, fveloso@cmu.edu
Abstract: Different types of innovations have been described in the literature: architectural, modular, etc. Yet, both transaction cost economics and the capabilities view of the firm fail to consider this when discussing the performance of an industry's vertical structure. We discuss how distinct innovations affect how TCE and capabilities shape the optimal level of vertical integration. We also distinguish between optimality in addressing exogenous technical change and in generating endogenous change.

P2. *Customer Technology Receptivity and the B2B e-Service Chain.* **Pedro Oliveira**, Assistant Professor, School of Economics and Management, Universidade Católica Portuguesa, Palma de Cima, Lisboa 1649-023, Portugal, poliveira@fcee.ucp.pt, **Aleda Roth**, W. P. Carey Chair of Supply Chain Management, Arizona State University, W. P. Carey School of Business, Tempe AZ 85287-4106, United States, aleda.roth@asu.edu
Abstract: This research investigates the role of customer technology receptivity, defined as the level of a business' receptivity and readiness to engage in electronic interactions and transactions, as an operational antecedent of B2B e-service capability. Using data from 181 companies we find that a company's level of orientation towards service will have an impact on the customer technology receptivity, which on its turn has a positive impact of a company's B2B e-service capability.

P3. *Outsourcing: The Impact of Learning-by-Doing and Strategic Behavior.* **John Gray**, University of North Carolina--Chapel Hill, Campus Box 3490, McColl Building, Chapel Hill NC 27599-3490, United States, john_gray@unc.edu, **Aleda Roth**, Arizona State University, aleda.roth@asu.edu, **Brian Tomlin**, University of North Carolina, McColl Building, CB3490, Chapel Hill NC 27599, US, Brian_Tomlin@unc.edu
Abstract: We investigate the impact of learning-by-doing and strategic behavior on manufacturing outsourcing decisions. We study a two-period game in which an original equipment manufacturer (OEM) can, if it chooses to, source production from a contract manufacturer. We show how firm characteristics (learning rates, costs, etc.) and market characteristics influence the optimal outsourcing strategy.

P4. *Efficiency and Fairness in the Core of the Internet Backbone*, **Pedro Ferreira**, Post-Doctoral Fellow, University of California at Berkeley, 770 California #206, San Francisco CA 94108, United States, pedro@sims.berkeley.edu
Abstract: Connectivity in the Internet backbone is provided by agreements among ISPs, but existing transit and peering agreements are highly inefficient and unfair. Smaller ISPs in less developed regions pay extremely high transit fees to access eye-balls in the ISPs based in more developed countries while the latter ISPs peer without cash settlements. A more efficient interconnection mechanism is proposed in this paper, which associates a different forwarding price to each destination.

TB19 10:00 - 11:30 Technology Strategy and Global Competition

Chair: **Francisco Veloso**, Assistant Professor, Carnegie Mellon University, Engineering and Public Policy, 5000 Forbes Av, Pitts PA 15213, United States, fveloso@cmu.edu

P1. *Managing Risk and Uncertainty in Technology Industries: Comparing Software, Biotech and Materials*. **Elicia Maine**, Assistant Professor, Simon Fraser University, Management of Technology MBA, Vancouver BC, CA, emaine@sfu.ca
Abstract: The combination of technical and market risks and uncertainties in the emerging technology industries of software, biotech, and advanced materials result in valuation and resource allocation challenges for investors and managers. A comparison is drawn between investment risk faced by ventures in these technology industries through data at the industry level and through an analysis of case studies.

P2. *Dominant Design and Population Dynamics for Complex Technological Systems*. **Jaegul Lee**, PhD Candidate, Carnegie Mellon University, Pittsburgh PA 15213, United States, jaegull@andrew.cmu.edu
Abstract: This work examines sources of innovation and population dynamics of innovating firms `during the entire technology cycle for a complex technological system: vehicle emission control. Contrary to expectations, analysis shows increasing entry of innovative firms during the era of incremental innovation, following the emergence of a dominant design. This result is used to provide new insights into our understanding of technological change in complex systems that embed core and peripheral subsystems.

P3. *Changing Paths: The Impact of Manufacturing Off-shore on Technology Development Incentives*, **Erica Fuchs**, PhD Candidate, Massachusetts Institute of Technology, Materials Systems Laboratory, Cambridge MS 02141, United States, erhf@mit.edu, **Randolph Kirchain**, Assistant Professor, Massachusetts Institute of Technology, Cambridge MA 02141, United States, Kirchain@mit.edu
Abstract: Firm decisions to manufacture offshore may be changing their long-term technology development path. Data shows manufacturing offshore significantly changes production characteristics – wage, yield, cycle times, downtimes, materials costs. Resulting cost structure differences between the U.S. and developing East Asia change the relative economic competitiveness of the technology alternatives facing industry.

P4. *Innovation for Industry Dominance: How an Integral Product Architecture changed the Structure of the Bicycle Component Industry*. **Jin-Kyu Park**, University of Michigan, INDUSTRIAL AND OPERATIONS ENGINEERING, Ann Arbor MI, United States, jinkp@umich.edu, **Sebastian Fixson**, Assistant Professor, University of Michigan, 1205 Beal Avenue, IOE 2793, Ann Arbor MI 48109, United States, fixson@engin.umich.edu

Abstract: Recent work has mostly highlighted the advantages of higher degrees of modularity in product architecture. In contrast, this paper investigates: (1) if there are incidences in which an integral and not the modular product architecture wins? and (2) what are the circumstances that contribute to this outcome? Studying the U.S. bicycle component industry we explore how a non-dominating foreign firm changes its product architecture from modular to integral and corners the market.

TC19 13:30 - 15:00 Entrepreneurship

Chair: **Moren Levesque**, Assistant Professor of Entrepreneurship and of Operations, Case Western Reserve University, 10900 Euclid Avenue, Cleveland OH 44106, United States, mxl101@cwru.edu

P1. *Market Share and Market Demand in Nascent Industries.* **John Angelis**, Case Western Reserve University, 10900 Euclid Avenue, Cleveland OH 44106, United States, john.angelis@case.edu

Abstract: Entrepreneurs strive to maximize their profits by increasing market share. However, unlike oligopolists in mature industries, they also can maximize their profits by convincing new customers to enter the market. This paper will investigate financial investment strategies and tradeoffs between increasing market share and stimulating primary demand. We also look at how contractual spillover profits from the new customers can affect the optimal solution.

P2. *Putting the Choice Between Exploration and Exploitation in Context*. **David Deeds**, Associate Professor, University of Texas at Dallas, P.O. Box 830688, Richardson TX 75083, United States, dxd52@po.cwru.edu, **Joseph Coombs**, University of Richmond, Richmond VA 23173, United States, jcoombs@richmond.edu

Abstract: We study the impact of explorative and exploitative search on a technology venture's ability to develop new products in different geographic regions of varying levels of munificence. We develop a model of search strategies whose benefits are contingent upon the characteristics of the local region and test it on a sample of 174 US-based pharma biotechnology firms.

P3. *Entrepreneurship and Aggregate Economic Activity*. **Moren Levesque**, Assistant Professor of Entrepreneurship and of Operations, Case Western Reserve University, 10900 Euclid Avenue, Cleveland OH 44106, USA, mxl101@cwru.edu, **Maria Minniti**, Associate Professor, Babson College, Boston MA, United States, minniti@babson.edu

Abstract: Endogenous growth theory provides many occasions to appreciate the role played by entrepreneurship in the growth process. And yet, entrepreneurs have remained surprisingly neglected. Smaller and entrepreneurial firms, however, are crucial for the long run competitiveness of a country. The purpose of this paper is to point out the macroeconomic implications of entrepreneurial behavior.

TC19 16:30 - 18:00 Theoretical, Experimental, and Econometric Approaches to Entrepreneurship and Innovation

Chair: **Christian Schade**, Professor, Institute for Entrepreneurial Studies and Innovation Management, Humboldt University Berlin, Spandauer Str. 1, Berlin DE 10178, Germany, schade@wiwi.hu-berlin.de

P1. *When Should New Products be Preannounced?* **Joachim Büschken**, Prof. Dr., Catholic University Eichstaett, Institute for Marketing, Auf der Schanz 49, Ingolfstadt DE 85049, Germany, joachim.bueschken@ku-eichstaett.de

Abstract: In industries like computer game software or commercial aircraft, new product preannoucement (NPP) is the norm. Research focuses on NPP's effects on consumer behavior, but we know little about NPP timing. The paper builds upon Lilly and Walters (1997, 2000) to develop a system dynamics model of optimal NPP timing. The model incorporates the influence of competitive action, often retaliatory in nature. The model is used to develop testable hypotheses on optimal NPP timing.

P2. *Predicting New-product Adoption Time with a Spatial Model.* **Christian Schade**, Professor, Institute for Entrepreneurial Studies and Innovation Management, Humboldt University Berlin, Spandauer Str. 1, Berlin DE 10178, Germany, schade@wiwi.hu-berlin.de, **Yasemin Boztug**, Assistant Professor, Institute for Marketing, Humboldt University Berlin, Spandauer Str. 1, Berlin DE 10178, Germany, boztug@wiwi.hu-berlin.de

Abstract: Development of new product sales can be predicted via adoption time of individuals. One might also want to incorporate spatial dependence, geographical and social, between consumers. We present a model based on these premises and analyze data for the diffusion of digital cameras in Germany. We start with a linear regression analysis with adoption time as the dependent variable and introduce, in a stepwise manner, different spatial extensions. The predictive power of the models is compared.

P3. *German and Russian entrepreneurs – A quasi-experimental study on differences in traits and behavior*. **Katrin Burmeister**, Research Associate, Institute for Entrepreneurial Studies and Innovation Management, Humboldt University Berlin, Spandauer Str. 1, Berlin DE 10178, Germany, burmeister@wiwi.hu-berlin.de, **Christian Schade**, Professor, Institute for Entrepreneurial Studies and Innovation Management, Humboldt University Berlin, Spandauer Str. 1, Berlin DE 10178, Germany, schade@wiwi.hu-berlin.de, **Ulrik Schöneberg**, Student, Humboldt University Berlin, Am Birkenwerder 55, Berlin DE 12621, Germany, ulrik1@gmx.de

Abstract: Entrepreneurs' traits have been investigated to forecast the propensity to start a business or the success of an existing venture. In this study, quasi-experimental and experimental in nature, we compare traits such as openness for experience and manipulate decision behavior of entrepreneurs from Russia and Germany. We examine, e.g., whether different tendencies to fall prey to a status quo bias or to be affected by extremeness aversion result from country differences or from traits.

P4. *Innovation and Coordination in the Experimental Economics Laboratory*. **Claudia Keser**, IBM T.J. Watson Research Center, P.O. Box 218, Yorktown Heights NY 10598, United States, ckeser@us.ibm.com

Abstract: We examine innovation coordination in simple games with multiple equilibria. These coordination games involve the choice between payoff- and risk-dominant equilibria. Game theory makes no clear-cut prediction as to which equilibrium to choose. We present some results on how interaction structures

and other aspects can influence participants' coordination on either of the equilibria in the experimental economics laboratory and discuss potential implications for innovation.

Wednesday, November 16th

WA19 08:00 - 09:30 Management Applications of DEA

Chair: **Tim Anderson**, Portland State University, PO Box 751, Mail Code ETM, Portland OR 97207-0751, United States, tima@etm.pdx.edu

P1. *Improving Time to Market Forecasts: Technology Forecasts for Predicting Fighter Jets (1944-1982)*. **Tim Anderson**, Portland State University, PO Box 751, Mail Code ETM, Portland OR 97207-0751, United States, tima@etm.pdx.edu, **Robert Harmon**, Portland State University, PO Box 751, Portland OR, United States, corevalue@comcast.net, **Lane Inman**, Veritas Corp., Veritas Corp., Portland OR, USA, oliinman@gmail.com
Abstract: We extend a classic study of U.S. fighter jets to compare technology forecasting using data envelopment analysis (TFDEA) to the classic regression-based forecast. We used aircraft introduced between 1944 and 1959 to predict the first flights of those introduced later, 1960-82. TFDEA better predicted first flight dates than the regression forecast. Results indicated TFDEA may be a powerful new technique for predicting complex technological trends and time to market for new products.

P2. *Navigating Process Improvement: IDEF0 Maps with DEA Compasses*. **And Ozbay**, Lead Operations Researcher, Wells Fargo, 18700 NW WALKER RD, MAC P6053-022, Beaverton OR 97006, USA, and.ozbay@wellsfargo.com, **William Eisenhauer**, Manager / MSA, Well Fargo, 18700 NW WALKER RD, MAC P6053-022, Beaverton OR 97006, United States, Ike.D.Eisenhauer@wellsfargo.com
Abstract: Integration DEFinition Language 0 (IDEF0) provides a method to depict complex systems. An integral part of IDEF0 diagrams is inputs and outputs for a process. Measurable inputs and outputs associated with an IDEF0 mapped process provide a ripe opportunity to measure the process productivity. The illustrated integration of an IDEF0 mapped process into a DEA based process efficiency measurement system used at a major financial institution, will be presented.

P3. *Labor Productivity in the Construction Industry*. **Gerald Williams**, R. Brown Consulting Group LLC, 2300 SW First Avenue, Suite 102, Portland OR 97212-5047, United States, Gerry@CEMResearch.com, **Evan Lenneberg**, Student, Arizona State University, 2300 SW 1st Avenue, Suite 102, Portland OR 97201-5047, United States, Evan.Lenneberg@asu.edu
Abstract: The commercial construction industry is over 10% of US GDP. Labor is the single largest variable cost in construction and impact to labor productivity is a major concern of construction contractors. This paper uses DEA to empirically evaluate the magnitude of certain types of labor impacts on productivity.

P4. *Revisiting DEA as a Tool for Vendor Evaluation and Selection*. **Johannes Grefe**, Portland State University, Bussardstr.6, Reichertshofen, Germany, johannes.grefe@t-online.de
Abstract: Recently a variation of DEA was proposed as a tool for supply base optimization through vendor evaluation. This application is revisited and critiqued in terms of both methodology and interpretation of results.

WB42 10:00 - 11:30 Panel Discussion: ETMERC - Engineering and Technology Management Education and Research Council

Chair: **Dundar F. Kocaoglu**, Portland State University, Department of Engineering and Technology, Portland OR 97207, kocaoglu@etm.pdx.edu

Participants: **John Aje**, V.P.-Education, ETMERC, University of Maryland University Campus, MD, United States, jaje@umuc.edu; **Anthony Bailetti**, V.P.-Research, ETMERC, Carleton University, Canada, bailetti@ichu.com, **Antonie de Klerk**, President, ETMERC, University of Pretoria, South Africa, antonie@up.ac.za, **William Flannery**, V.P.-Membership, ETMERC, University of Texas San Antonio, TX, United States, wflannery@utsa.edu, **Tinus Pretorius**, Executive Vice President, ETMERC, University of Pretoria, South Africa, tinus.pretorius@eng.up.ac.za

Abstract: ETMERC (Engineering and Technology Management Education & Research Council) was established in 2003 to address educational and research issues common to all educational institutions in this field. The Council is made up of the educational department/program heads and their designees. The activities include conducting benchmark studies, developing curriculum guidelines, establishing quality criteria, defining research agenda among others. ETMERC will be explained; its activities will be described; and an open discussion will be held on strategic issues, future directions and members' pro-active roles in defining the field and bringing it to higher levels of recognition and visibility.

TMS OFFICERS 2005

Chair:	**Diane Bailey** (diane.bailey@stanford.edu)
Chair-Elect:	**Moren Lévesque** (mxl101@cwru.edu)
Vice Chair Programs:	**Sebastian Fixson** (fixson@umich.edu)
Vice Chair Membership & Communication:	**Francisco Veloso** (fveloso@cmu.edu)
Information Officer:	**Ken Hung** (khung@suffolk.edu)
Past Chair:	**Sarfraz Mian** (mian@oswego.edu)

INFORMS – New Product Development
San Francisco, CA '05
Sponsored/Invited Program
(Nov 13 - 15, Sun-Tue)

Dear TMS members,

The 2005 INFORMS New Product Development (NPD) cluster boasts over 28 individual presentations in eight sessions. In addition, the cluster features two panel sessions. One panel will consist of journal editors in the areas of new product development and technology management. The other will consist of leading researchers in the organization sciences who are seeking to find high-leverage areas of common interest between organizational, strategy, and NPD/TMS researchers in a session entitled. Along with the TMS section, we will also be co-sponsoring an entire session by the 2005 distinguished speaker, Dr. Eric von Hippel Our program concludes with a panel on technology management education and research aspects. We hope you find the program interesting, and participate in presentations and discussions.

On *Sunday, November 13*, the NPD cluster features sessions on the pharmaceutical industry, NPD supply chains, and empirical and experimental research in NPD. The cluster concludes with a panel session of NPD and TMS departmental editors, including Management Science, Production and Operations Management, and Manufacturing & Service Operations Management. We are also delighted that the editors-in-chief of Management Science and M&SOM will also be present on the panel.

On *Monday, November 14*, the NPD cluster begins with on models of human behavior in an NPD context and market & technology management. Then we will have a panel session of distinguished organizational sciences and strategy professors to explore new, but underdeveloped areas of research that can fruitfully benefit from the attention of INFORMS researchers employing techniques such as analytics or simulation modeling. Monday concludes with Dr. Eric von Hippel, of the MIT Sloan School of Management who will talk about his new book "Democratizing Innovation."

Tuesday, November 15, begins with a session on managing the R&D pipeline. The NPD cluster then concludes with a session on product design and supply chain issues.

We're looking forward to seeing you all in San Francisco!

Sunday, October 24th

SA17 08:00 - 09:30 Models for Pharmaceutical R&D Management

Chair: **Stefanos Zenios**, Stanford University, 518 Memorial Way, Stanford CA, United States, Stefzen@leland.stanford.edu

P1. *Real Options in Partnership Deals: The Perspective of Cooperative Game Theory.* **Stefan Scholtes**, Judge Business School, University of Cambridge, Cambridge CB2 1AG, United Kingdom, s.scholtes@jims.cam.ac.uk, **Nicos Savva**, Judge Business School, University of Cambridge, Cambridge CB2 1AG, United Kingdom, n.savva@jims.cam.ac.uk
Abstract: Pharmaceutical co-development deals form the practical background for this paper. We study the effect of phased investments and optionality on the negotiation set, the core, of a cooperative game. The valuation focuses on two cases: (i) the uncertainty can be fully hedged and (ii) hedging opportunities are discarded and preferences are expressed by certainty equivalents. In both cases the stochastic game can be reduced to an equivalent deterministic game. We discuss managerial implications.

P2. *Optimal Licensing for R&D Projects*. **Bert De Reyck**, London Business School, Regent's Park, London UK NW1 4SA, United Kingdom, bdereyck@london.edu, **Pascale Crama**, PhD, London Business School, Regent's Park, London UK NW1 4SA, United Kingdom, pcrama@london.edu, **Zeger Degraeve**, London Business School, Regent's Park, London UK NW1 4SA, United Kingdom, zdegraeve@london.edu
Abstract: We design optimal licensing contracts for R&D projects with milestone payments and royalties. We maximize the licensor's expected NPV for diverse states in terms of information on the licensee's valuation and control over the licensee's effort. The optimal contract depends on the scenario and in the case of incomplete information and control, the licensor uses trade-offs between milestones and royalties to screen the licensee and vary the incentives. We conclude with managerial insights.

P3. *Toward Optimizing R&D Allocation in the Pharmaceutical Industry*. **John Cavallaro**, PhD Candidate, Stanford University, Mangement Science & Engineering, Stanford CA, United States, john.cavallaro@stanford.edu. **Stefanos Zenios**, Stanford University, 518 Memorial Way, Stanford CA, United States, Stefzen@leland.stanford.edu
Abstract: We model the optimal budget allocation between pharmaceutical R&D and marketing. Regression against observed returns is significant but weak. However, when the firms are clustered into two groups, those high in both therapeutic area (TA) intensity and US sales (vs. low in both), significance and strength improve. The cluster with high TA intensity and high US sales correlates well with the model, suggesting that for some firms, adjusting the R&D allocation could improve return.

SB17 10:00 - 11:30 New Product/Service Development

Chair: **Weiyu Tsai**, Assistant Professor, University of Utah, 1645 E. Campus Center Dr., #107, Salt Lake City UT, United States, mgtwt@business.utah.edu

P1. *How Component Sharing Impacts Consumer Perceptions about Product Similarity and Product Preferences*. **Kamalini Ramdas**, Associate Professor, UVA-Darden, 189 FOB, 100

Darden Blvd, Charlottesville VA, United States, ramdask@Darden.virginia.edu, **Oleksandr Zhylyevskyy**, University of Virginia, Dynamics Building, UVA, Charlottesville VA, USA, oz9a@cms.mail.virginia.edu
Abstract: While many researchers have examined the impact of components sharing on costs, the market impact of components sharing is less well understood. Using data from a simulated test market (STM) experiment using 302 test consumers that we conducted at a major multinational wristwatch manufacturer, we empirically examine the impact of the sharing of different types of components on A) consumer preferences and B) perceived similarity across products.

P2. *Technology Markets: The Case of Component Providers.* **Sanjiv Erat**, College of Management, Georgia Institute of Technology, Atlanta, USA, sanjiv.erat@mgt.gatech.edu. **Cheryl Gaimon**, Regents Professor, Georgia Institute of Technology, 800 West Peachtree St. NW, Atlanta GA, United States, cheryl.gaimon@mgt.gatech.edu. **Stylianos Kavadias**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, stylianos.kavadias@mgt.gatech.edu
Abstract: Many firms in technology intensive end-product markets act as component-integrators and buy their core components from outside providers. Such technology providers who sell the components are near-monopolies when compared to the intense competition that characterizes the end-product markets. In such a setting, we examine the two main dimensions of technology provider's development decision - the technological advancement to offer in the component, and the additional functionality to provide.

P3. *Customer Activity Chain: The Source of Promise in New Service Development*. **Weiyu Tsai**, Assistant Professor, University of Utah, 1645 E. Campus Center Dr., #107, Salt Lake City UT, United States, mgtwt@business.utah.edu. **Rohit Verma**, Associate Professor, University of Utah, 1645 E. Campus Center Dr., #107, Salt Lake City UT, United States, mgtrv@business.utah.edu
Abstract: In today's competitive market, product-oriented as well as service-oriented companies are increasingly seeking service innovation to sustain their growth and long term survival. Especially for manufacturing companies in search of growth in the market flooded with commoditized products, it seems appealing to offer new and novel services peripheral to their core products. We suggest focusing on the "Customer Activity Chain" to define/design/deliver/debug (4-d) the NSD process.

SC17 13:30 - 15:00 Experimental and Empirical Research in NPD

Chair: **Svenja Sommer**, Purdue University, Krannert School of Management, 403 W. State Street, W. Lafayette IN 47907, United States, ssommer@krannert.purdue.edu

P1. *Social Goals, Emotions, and Motivation of Professional Workers*. **Christoph Loch**, Professor of Technology Management, INSEAD, Fontainebleau Cedex 77305, France, Christoph.Loch@insead.edu. **Julie Urda**, Ph.D. candidate, INSEAD, Boulevard de Constance, Fontainebleau 77305, France, julie.urda@insead.edu
Abstract: R&D professionals have autonomy and cannot be fully monitored; thus, motivation is important for their performance. Work in psychology has shown that people pursue social goals—status, reciprocity, and group identity—for their own sake. We present evidence from laboratory experiments that the social goals work through the triggering of emotions: their fulfillment or denial causes happiness, anger, sadness, etc. Results have implications for managerial actions to motivate R&D workers.

P2. *Preliminary Results from an Empirical Analysis of Managing Outsourced Product Design*. **Edward Anderson**, University of Texas at Austin Business School, McCombs School of Business, 1 University Station B6500, Austin TX 78733, United States, Edward.Anderson@mccombs.utexas.edu, **Alison Davis-Blake**, University of Texas, McCombs School of Business, 1 University Station B6300, Austin TX 78712, United States, Alison.Davis-Blake@mccombs.utexas.edu. **Geoffrey Parker**, Tulane University, gparker@tulane.edu
Abstract: We present preliminary statistical results from a survey studying how firms manage and integrate outsourced portions of their core product development process in environments characterized by rapid technological and market change. In particular, we discuss the role of supply chain integrators whose job is to maintain product coherence across firm boundaries.

P3. *Valuing R&D Projects in the Pharmaceutical Industry.* **Christian Terwiesch**, Associate Professor, The Wharton School, 548 Jon M. Huntsman Hall, Philadelphia PA 19104.6366, United States, terwiesch@wharton.upenn.edu. **Karan Girotra**, The Wharton School, 3730 Walnut St. STE 500 JMHH, Philadelphia PA 19104, United States, karang@wharton.upenn.edu, **Karl Ulrich**, Professor, The Wharton School, 548 JMHH, Philadelphia PA, United States, ulrich@wharton.upenn.edu
Abstract: We present an empirically grounded valuation of R&D projects in the pharmaceutical industry. Data based on a multi-year research collaboration with a large pharma company as well as a proprietary database of several thousand compounds.

P4. *Flexibly Managing Start-Ups: A Method for Monitoring Progress and Overcoming Crises.* **Svenja Sommer**, Purdue University, Krannert School of Management, 403 W. State Street, W. Lafayette IN 47907, United States, ssommer@krannert.purdue.edu. **Christoph Loch**, Professor of Technology Management, INSEAD, France, Christoph.Loch@insead.edu
Abstract: Managers of start-ups face many unforeseen challenges and are often forced to make decisions without having a clear idea of the likely outcomes. This requires a degree of flexibility beyond what standard risk management techniques would recommend. We present preliminary results of a survey trying to identify planning and monitoring methods that are adjusted to different levels of complexity and uncertainty that various new ventures face.

SD17 16:30 - 18:00 Panel Discussion: New Product Development, Innovation & Technology Management

Chair: **Janice Carrillo**, Assistant Professor, University of Florida, PO Box 117169, Gainesville FL 32611-7169, United States, janice.carrillo@cba.ufl.edu

Panelists: **Janice Carrillo**, Assistant Professor, University of Florida, **Cheryl Gaimon**, Regents Professor, Georgia Institute of Technology, 800 West Peachtree St. NW, Atlanta GA, USA, cheryl.gaimon@mgt.gatech.edu, **Wallace Hopp**, Professor, Northwestern University, 2145 Sheridan Rd. C210, Evanston IL 60208, USA, hopp@northwestern.edu, **Vish Krishnan**, Vish.Krishnan@mccombs.utexas.edu, **Christoph Loch**, Professor of Technology Management, INSEAD, Boulevard de Constance, Fontainebleau Cedex 77305, France, Christoph.Loch@insead.edu. **Christian Terwiesch**, Associate Professor, The Wharton School, 548

Jon M. Huntsman Hall, Philadelphia PA 19104.6366, United States, terwiesch@wharton.upenn.edu. **Garrett van Ryzin**, Professor, Columbia University, gjv1@columbia.edu
Abstract: A panel of editors will convene to discuss research opportunities in the areas of New Product Development, Innovation and Technology Management. The panel will identify current trends in this important field of inquiry, and discuss publishing opportunities within the Management Science community.

Monday, November 14th

MA17 08:00 - 09:30 Models of Human Behavior in New Product Development

Chair: **Edward Anderson**, University of Texas at Austin Business School, McCombs School of Business, 1 University Station B6500, Austin TX 78733, United States, Edward.Anderson@mccombs.utexas.edu

P1. *Leapfrogged Learning: Design Iteration Timing in New Product Development.* **Daniel McCarthy**, PhD Student, MIT, 44 Offutt Road, Hanscom AFB MA 01731, United States, djmc@mit.edu. ***Nelson Repenning***, Associate Professor, MIT, 30 Wadswroth St., Room E53-335, Cambridge MA 02142, United States, nelson@mit.edu
Abstract: As the pressure to bring new products to market increases, companies often compress their design iteration cycle times in an effort to develop products more quickly. In many cases, design cycles overlap significantly creating situations where learning opportunities (e.g. through testing) are missed and/or ignored. In this paper, we develop a System Dynamics model of the design-prototype-test cycle to explore the effects of iteration cycle timing on learning.

P2. *The Impact of Parts Commonality on Development Lead Times and Costs*. **Thomas Roemer**, MIT, E53-387, Cambridge Ma, United States, troemer@mit.edu. **Sebastian Fixson**, Assistant Professor, University of Michigan, 1205 Beal Avenue, IOE 2793, Ann Arbor MI 48109, United States, fixson@engin.umich.edu
Abstract: We study the impact of common parts across product platforms on product development lead times and cost. We argue that commonality can induce coupling of otherwise independent development processes, and lead to additional design iterations. As a result, new product introduction can experience significant delays and costs under commonality. Based on a simple model we present a framework of how rework frequency and rework intensity impact development lead times and costs.

P3. *Miscommunication or Concealment? Game Theoretic Analysis of Information Exchange in Complex Projects*. **Nitin Joglekar**, BU School of Management, 595 Commonwealth Avenue, Boston MA, United States, joglekar@bu.edu. **Lihui Lin**, BU School of Management, 595 Commonwealth Avenue, Boston, MA, lhlin@bu.edu
Abstract: Evidence from complex and distributed projects shows patterns of evolution and rework such that concerned parties may not truthfully reveal their progress. When uncovered late, problems are expensive and time-consuming to solve. We model the impact of parties' strategic behaviors in communicating progress and quality of tasks when their incentives are not aligned. We illustrate conditions when such behaviors will negatively impact project lead-time and solve for optimal development strategies.

P4. *Dynamics of Platform-based Product Development.* **Hazhir Rahmandad**, MIT, 30 Wadsworth St., Room E53-364A, Cambridge MA 02142, United States, hazhir@MIT.EDU. **Nelson Repenning**, Associate Professor, MIT, 30 Wadswroth St., Room E53-335, Cambridge MA 02142, United States, nelson@mit.edu
Abstract: Building on case studies of software development we introduce the concept of "adaptation trap," where intendedly functional adaptation of workload can overload the PD organization and force it into firefighting because there is a delay in seeing the additional resource need from the field and underlying code-base. Moreover, the study highlights the importance of underlying product-base in platform-based PD, through their impact on quality of new models, and resource requirements for bug-fixing.

MB17 10:00 - 11:30 New Product Development Topics

Chair: **Cheryl Druehl**, University of MD, College Park, R.H. Smith School of Business, 4318 Van Munching Hall, College Park MD 20742, United States, cdruehl@rhsmith.umd.edu

P1. *Intra-firm Technology Transfer for Global New Product Development*. **Jiong Sun**, Carnegie Mellon University, Tepper School of Business, Pittsburgh PA 15213, United States, jiongs@andrew.cmu.edu. **Sunder Kekre**, Carnegie Mellon University, Tepper School of Business, Pittsburgh PA, United States, skekre@cmu.edu. **Cuihong Li**, Assistant Professor, University of Connecticut, School of Business, 2100 Hillside Road, Storrs C 06269, United States, Cuihong.Li@business.uconn.edu
Abstract: Motivated by a problem observed in a global company, we study two strategies of supplying a lag market with new products of superior quality developed in lead markets: transferring technology or exporting components. The former builds local production capabilities, but incurs significant technology transfer costs and may introduce potential competitors; while the latter saves transfer costs, reduces the likelihood of competition, but incurs significant unit landed cost.

P2. *Automatic Detection of Characteristic Values from Experimental Data: An application to the Bass Diffusion Model.* **Patricio Mendez**, Assistant Professor, Colorado School of Mines, Dept. Metallurgical and Materials Eng., 1500 Illinois St, Golden CO 80401, United States, pmendez@mines.edu. **Paulo Goncalves**, Assistant Professor, University of Miami, 404 KE School of Business Administration, Coral Gables FL 33124, United States, paulog@miami.edu. **Fernando Ordonez**, Assitant Professor, University of Southern California, 3715 McClintock Ave, GER-247, Los Angeles CA 90089, USA, fordon@usc.edu
Abstract: Researchers often use simulation to gain insight about nonlinear dynamic systems that cannot be solved in closed form. In this talk, we present an algorithm that integrates dimensional analysis to the backward elimination procedure of multivariate linear regressions to automatically identify scaling laws that predict characteristic values for nonlinear dynamic systems. We present a computational experiment that shows the viability of the method to the diffusion of a new product.

P3. *Problem Solving Efficiency in Complex Product Development*. **Phil Gouel**, University of Michigan, Industrial and Operations Engineering, Ann Arbor MI, United States, pgouel@umich.edu. **Sebastian Fixson**, Assistant Professor, University of Michigan, 1205 Beal Avenue, IOE 2793, Ann Arbor MI 48109, United States, fixson@engin.umich.edu

Abstract: The development of complex engineering products involves solving a large number of problems. One measure of the efficiency of these problem solving processes is the duration it takes to solve each individual problem. We study the problem solving processes in an automotive development context and find large variation of this efficiency measure. We identify several causes underlying this phenomenon.

P4. *Strategic NPD Portfolio Management in Complex Environments*. **Raul Chao**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, raul.chao@mgt.gatech.edu. **Stylianos Kavadias**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, stylianos.kavadias@mgt.gatech.edu
Abstract: This paper addresses the link between NPD portfolio strategy and firm performance. Firm performance is determined by a set of parameters and their interactions, which define environmental complexity. Our results indicate that the optimal NPD portfolio strategy depends on environmental complexity and environmental stability.

P5. *Low-End Encroachment: A Framework to Help Recognize Disruptive Technologies.* **Cheryl Druehl**, University of MD, College Park, R.H. Smith School of Business, 4318 Van Munching Hall, College Park MD 20742, United States, cdruehl@rhsmith.umd.edu. **Glen Schmidt**, McDonough School of Business, Georgetown University, Washington DC, United States, schmidtg@msb.edu
Abstract: While disruptive technologies are often thought of as low-priced, cell phones, initially expensive, appear to be a disruptive technology per Christensen's definition. We offer an explanation, showing how a new product first sells to a detached market segment but later still encroaches on the old product from the low end. We call this type of diffusion the detached-market form of low-end encroachment and contrast it with the fringe-market type of low-end encroachment and high-end encroachment.

MC17 13:30 - 15:00 Joint NPD/TMS Panel: How Organization Science should influence New Product Development & Management of Innovation Research

Chairs: **Edward Anderson**, University of Texas at Austin Business School, McCombs School of Business, 1 University Station B6500, Austin TX 78733, United States, Edward.Anderson@mccombs.utexas.edu. **Linda Argote**, Professor, Carnegie Mellon University, Tepper School of Business, 5000 Forbes Ave., Pittsburgh PA 15213, USA, argote@andrew.cmu.edu

Panelists**: Andrew Henderson**, University of Texas, McCombs School of Business, 1 University Station B6300, Austin TX 78712, Andy.Henderson@mccombs.utexas.edu, **Riitta Katila**, Assistant Professor, Stanford University, Dept. of Management Science and Engineering, Terman 413, Stanford CA 94305, rkatila@stanford.edu, **Margaret Peteraf**, Professor, Tuck School of Business, Dartmouth, 100 Tuck Hall, Hanover NH 03755, United States, margaret.a.peteraf@dartmouth.edu

Abstract: The panel of distinguished organization science experts will discuss what they think are under-explored areas of research in the management of technology and product innovation that may be especially fruitful for INFORMS modelers and empiricists to study. Dr. Argote is an expert on learning in organizations; Dr. Henderson on diversification in high-tech environments; Dr. Katila on technology strategy and organizational evolution; and Dr. Peteraf on firm capabilities in dynamic environments.

MD19 16:30 - 18:00 TMS/NPD Distinguished Speaker

Chair: **Sarfraz Mian**, Professor, SUNY Oswego, Oswego NY, United States, mian@Oswego.EDU

Democratizing Innovation. **Eric von Hippel**, Professor, MIT Sloan School, Cambridge MA, USA, evhippel@mit.edu
Abstract: In his lecture, the speaker will argue that innovation is rapidly becoming democratized. This cutting-edge research on innovation process reveals that lead users, both individuals and firms, aided by improvements in computers and communications technology, increasingly can develop their own new products and services; often sharing the results with others. These freely-revealed innovations by users are forming the basis for a user-centric innovation system.

Tuesday, November 15th

TA17 08:00 - 09:30 Managing the R&D Pipeline

Chair: **Stylianos Kavadias**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, stylianos.kavadias@mgt.gatech.edu

P1. *Drug Development: Portfolio Selection and Capacity Investments*. **Karan Girotra**, The Wharton School, 3730 Walnut St. STE 500 JMHH, Philadelphia PA 19104, United States, karang@wharton.upenn.edu. **Christian Terwiesch**, Associate Professor, The Wharton School, 548 Jon M. Huntsman Hall, Philadelphia PA 19104.6366, United States, terwiesch@wharton.upenn.edu. **Karl Ulrich**, Professor, The Wharton School, 548 JMHH, Philadelphia PA, United States, ulrich@wharton.upenn.edu
Abstract: New drug development presents some unique challenges with respect to selection of development portfolios, investments in R&D capacity and prioritization of competing development projects. We investigate alternate strategies along these dimensions that consider the competing benefits from focused versus diversified portfolios, high versus low utilization, high versus low selectivity.

P2. *Strategic NPD Pipeline Management with an Endogenous Budget.* **Raul Chao**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, raul.chao@mgt.gatech.edu. **Cheryl Gaimon**, Regents Professor, Georgia Institute of Technology, 800 West Peachtree St. NW, Atlanta GA, United States, cheryl.gaimon@mgt.gatech.edu. **Stylianos Kavadias**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, USA, stylianos.kavadias@mgt.gatech.edu
Abstract: We develop an analytical model to explore how a firm dynamically allocates resources between product development projects in the presence of an endogenous budget. Our results indicate that optimal balance depends on the cost of capital as well as the managerial control structure employed by the firm.

P3. *R&D Performance Volatility: A Behavioral Model.* **Gary Pisano**, Professor, Harvard Business School, Morgan Hall T86, Soldiers Field, Boston MA 02163, United States, gpisano@hbs.edu. **Fransesca Gino**, Lecturer, Post Doctoral Fellow, Harvard Business School, Morgan Hall T86, Soldiers

Field, Boston MA 02163, United States, fgino@hbs.edu
Abstract: We explore the underlying causes of R&D performance volatility over time at the firm level. R&D performance volatility has not been deeply examined in the literature despite its critical role in various industries. We use a simulation model to explore such phenomena, building on insights from behavioral theories of the firm: we argue that the performance swings, while rooted in uncertainty, are exacerbated by the behavioral influences in how decision makers deal with risk and uncertainty in R&D.

P4. *Product Positioning in a Two-Dimensional Market Space.* **Chengxin Qu**, INSEAD, BD CONSTANCE, FONTAINEBLEAU 77305, France, chengxin.qu@insead.edu. **Stylianos Kavadias**, Georgia Institute of Technology, 800 West Peachtree Street, Atlanta GA, United States, stylianos.kavadias@mgt.gatech.edu. **Christoph Loch**, Professor of Technology Management, INSEAD, Boulevard de Constance, Fontainebleau Cedex 77305, France, Christoph.Loch@insead.edu
Abstract: We examine the optimal composition of a firm's product portfolio to optimize the number of products, their features, prices, and qualities in multi-attribute markets. The end-products are development intensive. If customers are uniformly distributed in this market, products are differentiated only through their features. When the distribution of customers is non-uniform or the deviation costs differ, we show numerically that in optimal positioning products differ in price and quality.

TB17 Nov 15, 10:00 - 11:30 Product Design and Supply Chain Issues

Chair: **H. Sebastian Heese**, Assistant Professor of Operations and Decision Technologies, Kelley School of Business - Indiana University, 1309 E 10th St, Bloomington IN 47405, United States, hheese@indiana.edu

P1. *Integration of Marketing, Product Development and Supply Chain Decisions*. **Nitin Joglekar**, BU School of Management, 595 Commonwealth Avenue, Boston MA, United States, joglekar@bu.edu
Abstract: We present evidence from global development practices to illustrate the inherent tensions in the integration of distributed marketing, product development and supply chain decisions. Our analysis suggests that, shared supply chains and postponement practices are not viewed as mechanisms that promote integration and responsiveness, and dedicated supply chains coupled with mandated stretch goals for rapid reductions in costs and time to market are the drivers of integration.

P2. *Coordination of Supply Chain under Misplaced Inventory.* **Almula Z. Camdereli**, UNC - Chapel Hill, Kenan-Flagler Business School, McColl Building, Campus Box 3490, Chapel Hill NC 27599, USA, Zeynep_Camdereli@unc.edu. **Jay Swaminathan**, UNC - Chapel Hill, McColl building, 4717, Chapel Hill NC, United States, msj@unc.edu
Abstract: We consider an environment where although the items are physically in the store, a proportion of the items become unavailable for sale due to misplaced stock keeping units. We study both centralized and decentralized cases. We give conditions for coordinating the channel under buyback and revenue sharing contracts. We investigate the effects of investing in information technology to increase in the proportion of availability on retailer and manufacturer profits under different settings.

P3. *Linking Production Technology and Product Line Design.* **Serguei Netessine**, Assistant Professor, University of Pennsylvania, 3730 Walnut St. Suite 500, Philadelphia PA 19104, United States, netessin@wharton.upenn.edu. Terry **Taylor**, Associate Professor, Columbia University, Graduate School of Business, 3022 Broadway, New York NY 10027, United States, tat2002@columbia.edu
Abstract: In this paper we characterize the impact of production technology on the optimal product line design. We analyze a problem in which a manufacturer segments the market on quality attributes and offers products that are partial substitutes. Because consumers self-select from the product line, product cannibalization is an issue. In addition, the manufacturer sets a production schedule in order to balance production setups with accumulation of inventories in the presence of economies of scale.

P4. *Optimal Stocking Level of Products with Substitutable Demand.* **Wendell Gilland**, Assistant Professor, University of North Carolina, CB#3490, McColl Bldg, Kenan-Flagler Busi School, UNC, Chapel Hill NC 27599, United States, Wendell_Gilland@unc.edu. **H. Sebastian Heese**, Assistant Professor of Operations and Decision Technologies, Kelley School of Business - Indiana University, 1309 E 10th St, Bloomington IN 47405, United States, hheese@indiana.edu
Abstract: Customers that face a stockout situation often decide to purchase a different product in the same category. We analyze the resulting stocking problem in a retail environment with dynamic substitution , where customers serve themselves from the store shelves, such that the sequence of customer arrivals affects how scarce products are allocated to customers.

INFORMS – College on Organization Science
San Francisco, CA '05
Program
(Nov 12 - 13, Sat-Sun)

Saturday, November 12th

1:30 - 3:00 Managing Interorganizational Relationships
Chair: Nick Argyris, Boston University

P1. *Interorganizational Trust and Performance of Interorganizational Relationships in the Auto Industry.* **Jackson Nickerson**, Olin School of Business, Washington University, **Ranjay Gulati**, Kellogg School, Northwestern University
P2. *Fishing Upstream: Firm Innovation Strategy and University Research Alliances*, **Janet Bercovitz**, College of Business, University of Illinois, **Mary Ann Feldman**, Rotman School of Management, University of Toronto
P3. *Complementarity and Evolution of Contractual Provisions: Evidence from IT Services Contracts*. **Nicholas Argyres**, Boston University School of Management, **Janet Bercovitz**, University of Illinois and Kyle Mayer, USC Marshall School of Business
P4. *A New Mapping of Relational Bonds: Implications for Managing Inter-organizational Relationships*. **Peter Ring**, Loyola Marymount University

3:30-5:00 Role of knowledge & learning in innovation
Chair: **Alva Taylor**, Tuck School of Business, Dartmouth College

P1. *Firm-Level Heterogeneity and Persistent Differences in Innovation and Performance*. **Tammy Madsen**, The Leavey School of Business at Santa Clara University, **Michael Leiblein**, Fisher College of Business, Ohio State University
P2. *The Four Theories of Profit and Their Interactions, with Applications to Innovation*. **Rich Makadok**, Emory University
P3. *Risky Business? Entrepreneurship in the New Independent Power Sector*. **Wes Sine**, Johnson School of Management at Cornell University, **Heather Haveman**, Columbia University and Pamela Tolbert, Cornell University
P4. *How your Work Matters: The Importance of Organizational Context on Knowledge Use and Innovation.* **Alva Taylor**, Tuck School at Dartmouth College, **Lynn Foster-Johnson**

Sunday, November 13th

8:00 – 9:30 Innovation and Industry Evolution
Chair: Mary Tripsas, Harvard Business School

P1. *Multi-dimensional Product Differentiation Strategy and Incumbent Survival during Market Fusion.* **Raja Roy**, Tulane University
P2. *How Industries Emerge: Institutional Mechanisms in Electronic Database Services, 1968-1984.* **Marc Ventresca**, Said Business School, Oxford University, **Rodney Lacey**
P3. *Developing Alliance Capabilities: An Empirical Study.* **Koen Heimeriks**, Copenhagen Business School, **Geert Duysters**, Eindhoven University of Technology
P4. *Abandoning Innovation in Emerging Industries.* **Mary Tripsas**, Harvard Business School, **Rajshree Agarwal**, University of Illinois, **Barry Bayus**, University North Carolina

10:00-11:30 Evolution, Innovation & Competitive Heterogeneity
Chair: **Tammy Madsen**, The Leavey School of Business at Santa Clara University

P1. *Managing Returns to Investments in Capabilities: A Conceptual Framework*. **Catherine Maritan**, Syracuse University, **Todd Alessandri**, Syracuse University
P2. *The value of not being in sync: Temporal resource selection and product innovation.* **Riitta Katila**, Stanford University, **Eric Chen**, Stanford University
P3. *Turnover Events, Vicarious Information, and the Reduced Likelihood of Outlet Level Exit Among Small Multi-Unit Organizations*. **Arturs Kalnins**, Cornell University, **Anand Swaminathan**, University of California at Davis, **Will Mitchell**, Duke University

1:30 – 3:00 Engineering Networks
Chair: **Santiago Mingo**, Harvard Business School

P1. *Cohesion, Brokerage and Combinatorial Creativity.* **Santiago Mingo**, Harvard Business School, **Lee Fleming**, Harvard Business School
P2. *Non-competes and Inventor Mobility.* **Lee Fleming**, Harvard Business School, **Matt Marx**, Harvard Business School
P3. *Private Benefit from Public Good, Startup Strategies for Participation in an Open Standards Community .* **David M. Waguespack**, Robert H. Smith School of Business, University of Maryland, **Lee Fleming**, HBS
P4. *Broadcast Search and Solution Attraction in Scientific Problem Solving.* **Karim R. Lakhani**, MIT Sloan School of Management, **Lars Bo Jeppesen**, Copenhagen Business School

4:30 – 6:00 Organization Science: Perspectives on the Journal
Chair: **Linda Argote**, Carnegie Mellon University

P1. *Organization Science: Current Status and Future Directions.* **Linda Argote**, Carnegie Mellon University
P2. *Organization Science: Aiming for a successful experience.* Richard Burton, Duke University
P3. *Transactive Memory Systems, Learning and Learning Transfer.* **Kyle Lewis**, UT Austin, **Lynette Gillis**, UT Austin and **Donald Lange**, UT Austin
P4. *Cognition and Hierarchy: Rethinking the Microfoundations of Capabilities' Development.* **Giovanni Gavetti**, Harvard Business School

Calls for Papers

Special Issue of **IEEE Transactions on Engineering Management**
Theme: **University Technology Transfer**

Co-editors:
Albert N. Link-University of North Carolina at Greensboro (al_link@uncg.edu)
Frank T. Rothaermel-Georgia Institute of Technology (frank.rothaermel@mgt.gatech.edu)
Donald S. Siegel-Rensselaer Polytechnic Institute (sieged@rpi.edu)

Overview
The recent increase in university technology transfer, via patenting, licensing, research joint ventures, incubators, science parks, and NSF-sponsored Engineering Research Centers and Industry-University Cooperative Research Centers has important managerial and policy implications. We seek papers from scholars in management (e.g., strategy, entrepreneurship, human resource management, and technology/innovation management), economics, sociology, political science, public administration, and engineering that explore these implications. Both quantitative and qualitative papers are welcome. All papers will undergo double-blind, peer review.

Research Questions
Some research questions that might be addressed in this IEEE-TEM special issue are:
· Evaluation of institutions and programs involved in university technology transfer
· Differential performance within and across institutions (e.g., universities, incubators, science parks)
· Relationships between university and industry (e.g., intellectual property rights)
· University start-up and incubator firm differential performance
· The role of human resource management practices in university technology transfer
· Importance of strategic alliances and social networks in technology transfer
· Trade-off between commercial or applied research and basic research
· Effects of technology transfer on the educational process
· Effects of technology transfer on management, especially on engineering management,
· Conflicts of interest between scientists and universities
· Formulation of technology transfer strategies by universities or industry
· Implementation of technology transfer strategies by universities or industry

Deadline for papers to be submitted electronically at IEEE Manuscript Central (http://tem-ieee.manuscriptcentral.com) indicating that they are for the special issue on university technology transfer. March 31, 2006
Authors receive initial editorial decision June 2006
Special issue workshop at Georgia Tech for papers that are invited for revision late September 2006

Contact Person:
Frank T. Rothaermel [http://mgt.gatech.edu/rothaermel]
College of Management
Georgia Institute of Technology
800 West Peachtree St, NW
Atlanta, GA 30308-1149
Tel. 404-385-5108
FAX 404-894-6030
frank.rothaermel@mgt.gatech.edu

Special Issue of **The International Journal of Technology Management**
Theme: **Strategic issues in managing radical innovation in networks of high-tech strategic partners**

This special issue offers a key opportunity to understand radical innovation management in networks of high-tech strategic partners required to shape and enhance the new economy. There is practical value in understanding the pattern of radical innovation and the managerial competencies needed to make radical innovation happen. This understanding can help innovative networks apply better management practices to different types of innovation development and make the course of radical innovation shorter, less sporadic, less expensive, less uncertain, and more profitable.

Objective
The objectives of this special issue are: to develop and promote the field of radical innovation management in networks of high-tech strategic partners, to further the knowledge, research, theory and practice in this specific field, and to provide a platform for sharing and exchanging views, experience and ideas on the latest findings and best practices.
Papers dealing with (but not limited to) any of the following themes are appropriate for consideration:
Radical innovation in networks of strategic partners,
The role of the partners' organisational design in the radical innovation development,
The impact of radical technological innovation on partner relationships,
Human side of, and leadership in, radical innovation,
The role of knowledge management in radical innovation development,
Source of radical innovation in networks of strategic partners,
Educational institutes and industrial firms: two-ways interaction,
Managing intellectual property rights in networks of high-tech strategic partners,
Management models and methods leading to radical innovation,
Critical success factors for technological radical innovation,
State (government) policy to support radical innovation,
The role of geographical innovative-clusters in radical of innovation,
New approaches to evaluate the technology and the application of innovative projects.

Submission Instructions:
Paper submission must follow the instructions in "Notes for Intending Authors" available on Inderscience website: https://www.inderscience.com/papers
Please direct your submission or enquiries to the coordinator of this special issue, Mr. Yuosre Badir, (and, contrary to the IJTM website, not to the IEL Editorial Office).

Guest Editor
Prof Francis-Luc Perret,
College of Management of Technology (CDM),
Ecole Polytechnique Fédérale de Lausanne (EPFL)

Special Issue Coordinator:
Mr. Yuosre Badir, EPFL CDM

Important dates
Submission of papers : 15 November 2005
Feed-back to authors : 01 February 2006
Final paper due : 02. April 2006
Possible publication date : October/November, 2006

Call for Papers: **PICMET'06 conference in Istanbul**

November 1 is deadline for the submission of the abstracts (up to 200 words) for PICMET'06 conference that will be held at the Hyatt Hotel in Istanbul on July 9-13, 2006. The theme is "Technology Management for the Global Future". The emergence of the new powers in the "flat", technology-driven world, the opportunities and challenges of globalization, and the crucial role of managing innovation for success and leadership in this new world will be addressed by colleagues from around the world.

Research papers, industry applications, tutorials, workshops and panel discussions will be presented at the conference. All submissions will be subjected to double-blind peer-review process.

Abstracts must be submitted by November 20, 2005
For more information see http://www.picmet.org/Conferences/2006/

Call for Papers for the **2006 Annual Meeting of the Academy of Management**
Knowledge, Action and the Public Concern

Atlanta, Georgia - August 11-16, 2006 The Academy once again invites management scholars from around the world to convene in Atlanta, Georgia for its 66th Annual Meeting. As always, there will be excellent conversation, good friends and, of course, good cheers.
This year's theme explores the linkages among organizational knowledge, managerial action, and the major issues that face people in the global and knowledge economy. Please join your friends and colleagues in Atlanta to engage in the exciting discussion involving the interplay of "Knowledge, Action and the Public Concern".

The submission website will open on November 1, 2005. The submission deadline is Monday, January 9, 2006 at 5:00 PM Eastern Standard Time. For more information see http://meetings.aomonline.org/2006/

(Continued from page 1)

the annual meeting. We thank Sarfraz Mian, past chair, for inviting Eric to speak with us.

We received 12 dissertations for consideration in our annual dissertation prize. Moren Levesque, chair-elect, did an excellent job organizing the award committee that reviewed these dissertations and determined the winners. Please see p. 3 for her announcement of the first and second place winners, who will be presenting their work in a special session on Monday of this year's program. The number of dissertations received this year was twice what it was last year, but was still far from our high of 22 in 2003. We ask that our members encourage more submissions for next year. Please look for announcements in the winter.

Finally, because TMS also shares some joint interests with the College of Organization Science (COS), we also publish the COS program in the newsletter.

TMS's international involvement continues to grow. Elicia Maine, who last year served as our cluster chair for the joint INFORMS/CORS conference, continues as our Canadian regional representative. She is joined by Christian Shade, who serves as our Western Europe representative. Welcome, Elicia and Christian!
Finally, I would like to remind you of our web site: http://tms.section.informs.org/

As the TMS information officer, Ken Hung has been doing a super job of maintaining the site and our list-serv. Please send suggestions to Ken (khung@suffolk.edu) about information we might post on the web site or for ways we might enhance it to better meet our members' needs.