



From the Chair's Desk

Juliana Hsuan

The 2011 INFORMS theme is *Transformation - A Thorough or Dramatic Change*, reflecting so well on the difficult times we are currently facing. The global financial crisis has touched our lives one way or the other. From our profession's perspective, it has more than ever put technology management and new product development at the heart of many organizations. This is echoed in the excellent sessions organized by our superb Program Chair, Cheryl Druehl, in collaboration with Raul Chao. Similar to last year, we will feature a "Meet the Editors and Ask Them Questions" session. The panel will be joined by editors from *Management Science*, *Production and Operations Management*, *Decision Sciences*, and the *Journal of Operations Management* (see more in Cheryl Druehl and Raul Chao's report on page 5).

We will also feature a Distinguished Speaker session, organized by our Past Chair, Janice Carrillo. Our 2011 Distinguished Speaker Award goes to Professor Linda Argote of the Tepper School of Business at Carnegie Mellon University. Professor Argote has been an active member and contributor to INFORMS, and her accomplishments are breathtaking. Professor Argote will share with us her insights on organizational learning, transactive memory, and knowledge transfer (see more in Janice Carrillo's report on page 2).

This year's doctoral dissertation award competition was coordinated by myself and our Chair-Elect, Nile Hatch. The winner is Claudio Wolter for his work on "Technological Competences and Firm Boundaries: An Empirical and Conceptual Investigation of Diversification, Vertical Integration and Profitability." The Runner-up is Jianxi Luo for his dissertation on "Hierarchy in Industry Architecture: Transaction Strategy under Technological Constraints" (see more in

Juliana Hsuan's report on page 4). Congratulations to Claudio and Jianxi!

This newsletter has been prepared by our charismatic Vice Chair Membership & Communication, Leonardo Santiago. On the spirit of the conference theme of transformation, we have made a couple face lifts to the newsletter as well as to the TMS homepage. The newsletter has now a more contemporary look and we are under the process of changing our TMS homepage into INFORMS's format. Thanks to Leonardo and his team, our CIO Ken Hung, and John Angelis for making the transition. I hope you like the face lifts.

Finally, I would like to thank the past and present officers for their continuous support. I had a wonderful time during the past 5 years as a TMS officer. I have learned so much from all of them. Even more precious, I have made lifelong friendships that I cherish with all my heart.

I look forward to seeing you in Charlotte, North Carolina!

Charlotte BUSINESS MEETING

The Technology Management Section business meeting will be held on **Monday, November 14, at 6:00 pm**. Please join the TMS officers and other distinguished colleagues for a wine and cheese reception after the meeting.

IN THIS ISSUE

The TMS Distinguished Speaker	2
TMS Elected Officers 2011	3
TMS Doctoral Dissertation Award	4
TMS Charlotte NC Fall '11 Program	5
NPD Charlotte NC Fall '11 Program	12
TMS Past Chairs	17

TMS Distinguished Speaker



Linda Argote
Tepper School of Business
Carnegie Mellon University

2011 Distinguished Speaker
INFORMS
Technology Management Section

Janice Carrillo

It's my pleasure to announce that Professor Linda Argote will be the Technology Management Section (TMS) Distinguished speaker this year. She is currently the David M. and Barbara A. Kirr Professor of Organizational Behavior and Theory at the Tepper School of Business at Carnegie Mellon University. Professor Argote is an expert in the areas of organizational learning, transactive memory, and knowledge transfer. She will share her insights on these important topics with members of the TMS community.

EDITOR AND FELLOW. Professor Argote has served the INFORMS society in various positions. Most recently, she has served as the Vice-President of Publications for INFORMS. In addition, she has served as the editor in Chief for the Organization Science journal, and as the department editor for the Department of Organizational Performance, Strategy and Design for the Management Science journal. Most notably, she is an INFORMS Fellow for her significant contributions to the advancement of OR/MS. She

gained this recognition for her advances in understanding the roles that learning, knowledge transfer, and organizational memory play in firms, and for her editorial leadership in the Organization Science journal.

AIRPLANES, TRUCKS AND PIZZA. What do these three items have in common? They are three of the main industries studied by Professor Argote and her colleagues illustrating properties of organizational learning. She has written a seminal book entitled, "Organizational Learning: Creating, Retaining, and Transferring Knowledge," which summarizes many of these studies. The book is considered a classic textbook and reference in this area. According to one reviewer, "This book belongs on the shelf of every scholar and manager interested in how organizations learn (and forget)." In addition, her work has also been reported in the popular press, including the *New York Times* and *Scientific American*.

KNOWLEDGE: HOW TO GET IT AND HOW TO LOSE IT. Professor Argote has also won numerous honors for her body of research. One of her most famous articles is entitled, "The acquisition, Transfer and Depreciation of Knowledge in Service Organization: Productivity in Franchises," and is co-authored with Eric Darr and Dennis Epple. This paper originally appeared in *Management Science* in 1995, and was later cited as one of the most influential research papers published in *Management Science* during its first 50 years in existence. A key contribution of this paper is to identify and analyze knowledge depreciation as applied to service organizations (in particular, pizza parlors). Like manufacturing organizations, service organizations are shown to benefit from learning accumulation and transfer. However, the depreciation of knowledge is a significant factor particularly for this type of service environment where employee turnover is high.

TRANSACTIVE MEMORY: WHO KNOWS WHAT. Another noteworthy area of research for Professor Argote is the role of transactive memory in the firm. In her article which is co-authored by Liang and Moreland, Professor Argote characterizes the role of transactive memory in organizations: "A transactive memory system is useful because it can serve as an external storage device (like a library or computer) for everyone in the group. Individual group members are thus able to locate and retrieve information that might otherwise be unavailable to them." In her article "Individual Experience and Experience Working Together: Predicting Learning Rates from Knowing Who Knows What and Knowing How to Work Together," Professor Argote and her colleagues study knee replacement surgery performance in a teaching hospital. They identify and investigate specific mechanisms whereby individual experience, team experience, and organizational experience influence the surgery completion time. In another article on

TMS OFFICERS 2011

Technology Management Section

“The Contingent Effects of Transactive Memory: When Is It More Beneficial to Know What Others Know?,” Argote and her co-authors show that transactive memory decreases the group response and enhances the decision quality in an experimental setting.

LOOKING FORWARD. In her recently published article in *Management Learning*, Professor Argote offers insight into the future of research on Organizational Learning:

“Research on organizational learning will continue to pour forth in the foreseeable future. The research will be fed by different disciplines and different methods. Although some approaches might run up on shoals in shallow water, strong currents will carry the research forward to enrich our understanding of organizational learning. Because organizational learning is central to the success of organizations, a greater understanding of organizational learning promises to improve the performance of organizations and the prosperity of their members.”

ATTEND THE TALK. The topic of knowledge management has remained a key theme in the Technology Management Section (TMS) for many years. We look forward to hearing Professor Argote’s insights on this important topic at the INFORMS conference on Monday, November 14 at 4:30-6:00 p.m.

READ MORE. Here is a list of Professor Argote’s work as discussed in this article.

Argote, L. (2011). Organizational learning research: Past, present and future. *Management Learning*, 42 (4) 439–446.

Argote, L. (1999). *Organizational learning: Creating, retaining and transferring knowledge*. Norwell, MA: Kluwer.

Darr, E., Argote, L., & Epple, D. (1995). The acquisition, transfer, and depreciation of learning in service organizations: Productivity in franchises. *Management Science*, 44, 1750-1762.

Liang, D., Moreland, R., & Argote, L. (1995). Group versus individual training and group performance; The mediating effects of transactive memory. *Personality and Social Psychology Bulletin*, 21, 384-393.

Reagans, R., Argote, L., & Brooks, D. (2005). Individual experience and experience working together: Predicting learning rates from knowing what to do and knowing who knows what. *Management Science*, 51, 869-881.



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Claudio Wolter Wins 2011 TMS Doctoral Dissertation Award

Jianxi Luo is the Runner-Up – Congratulations!

Juliana Hsuan

The 2011 Best Dissertation Award experienced a tough competition. The results were announced in September 2011. The winner is Claudio Wolter for his dissertation on “Technological Competences and Firm Boundaries: An Empirical and Conceptual Investigation of Diversification, Vertical Integration and Profitability.” Claudio completed his dissertation in May 2010 at Carnegie Mellon University, where he currently is a post-doc. His research interests are related to how technological capabilities and innovation affect firm boundaries. In particular, Claudio is interested in understanding how innovations exogenously and endogenously affect value chains, not only in terms of firms' decisions regarding vertical integration, outsourcing and offshoring, but also vis-à-vis profit migration between segments of said value chain.



Claudio Wolter

The Runner-up is Jianxi Luo for his dissertation on “Hierarchy in Industry Architecture: Transaction Strategy under Technological Constraints.” Jianxi completed his dissertation in May 2010 at Massachusetts Institute of Technology. He is currently industry professor of innovation and entrepreneurship at the Department of Technology Management of Polytechnic Institute of New York University. Jianxi’s research focuses on innovation and strategy. His work has emphasized developing theories and methods on complex networks and applying them to understanding industry, organization, strategy and innovation.



Jianxi Luo

I would like to extend my warmest thanks to our panel of judges for their time and effort in reviewing the abstracts and dissertations: Janice Carrillo from the University of Florida, Moren Lévesque from York University, Anant Mishra from George Mason University, and Bradley Staats from University of North Carolina-Chapel Hill.

TMS Officer Juliana Hsuan from the Copenhagen Business School coordinated the review process.

Join us to share the excitement of their awards and a brief presentation of their work at our Business Meeting on Monday, starting at 6:15 pm at the Convention Center, Room 211B.

Congratulations to Claudio and Jianxi for their accomplishments!

INFORMS -Technology Management Section Charlotte, North Carolina 2011 Sponsored Program (November 13 - 16, Sun - Wed)

Cheryl Druehl

Dear TMS Colleagues,

On behalf of the Technology Management Section, it is a pleasure to welcome you to the INFORMS Annual Meeting, 2011 where we are excited to share two great clusters with you: Technology Management and New Product Development. We have a great selection of talks, offering an exciting combination of technology as well as management sessions. The talks are always very well attended, and we hope to have you join us again.

This year we are proud to welcome a mini-track on **Innovation and Entrepreneurship**, organized by Sinan Erzurumlu, Babson College and Moren Lévesque, York University. There will be three sessions, Sunday at 8 and 11, and Monday at 8. The first focuses on **financial processes** related to entrepreneurship, the second is all about the **process of entrepreneurship**, and the one Monday morning includes papers about **growing and commercializing entrepreneurial ventures** and technologies.

We thank all 24 session chairs and all participants for making this event exciting and interesting. We have sessions from Sunday, November 13, 2011, starting at 8:00 am, continuing until Wednesday, November 16, 2011 at 2:15 pm. There are 8 on Sunday, 8 on Monday, 6 on Tuesday, and 3 on Wednesday. We encourage you to review the session descriptions included in the newsletter and online to make your choices wisely. It will be hard to decide with so many great options!

Two special sessions you should consider "not to be missed" on Monday afternoon are co-sponsored by the Technology Management Section and New Product Development. First, the **Technology Management Distinguished Speaker, Professor Linda Argote**, David M. Kirr and Barbara A. Kirr Professor, Carnegie Mellon University, will be speaking about "Organizational learning, transactive memory, and knowledge transfer" on Monday, November 14, 2011, from 4:30 pm to 6:00 pm. The other session is "Meet the Editors and Ask Them Questions" and will be held on Monday, November 14, 2010, from 1:30 pm to 3:00 pm. We will be joined by editors (journal, department and senior) of *Management Science*, *Production and Operations*

Management Journal, *Decision Sciences*, and the *Journal of Operations Management*. We thank them for their support of our two areas and are looking forward to hearing their viewpoints.

Thank you for all of your support for the Technology Management and New Product Development INFORMS sessions held every year.

We hope to see you in Charlotte!

Cheryl Druehl and Raul Chao

Sunday, November 13

SA: 08:00 - 09:30 Innovation and Entrepreneurship I: Financing

CHAIR: **Sinan Erzurumlu**, Babson College, serzurumlu@babson.edu

The Relationship of Entrepreneurial Capability, Experience and Traits to Receiving Funding

PRESENTING AUTHOR: **Andrew Maxwell**, University of Waterloo, a2maxwel@engmail.uwaterloo.ca, CO-AUTHOR: **Moren Lévesque**, York University, MLevesque@schulich.yorku.ca

ABSTRACT: We observe business angel investors make actual investment decisions to formulate and test three hypotheses on how manifestations of entrepreneurial characteristics affect investors' risk perception and their likelihood of making an investment offer. We support an increasing linear relationship between that likelihood and capability or experience. For traits, however, we find an inverted U-shaped relationship.

Value of Reversed Factoring in Multi-stage Supply Chains

PRESENTING AUTHOR: **Fehmi Tanrisever**, Technische Universiteit Eindhoven, f.tanrisever@tue.nl, CO-AUTHORS: **Hande Cetinay**, Eindhoven University of Technology, H.Cetinay@tue.nl, **Matthew Reindorp**, Eindhoven University of Technology, M.J.Reindorp@tue.nl

ABSTRACT: Informational asymmetries may create a significant wedge between the costs of internal and external funds for small- and medium-sized enterprises (SMEs). This can have negative repercussions further along in a supply chain, since an SME may be a key supplier to a large corporation. We examine a recent development that promises to address such problems: so-called "reversed factoring" arrangements, which facilitate information revelation and thus trigger affordable financing.

Properties of the Venture Capital Deal Space under Private Information

PRESENTING AUTHOR: **Meyyappan Narayanan**, University of Waterloo, mnarayanan@uwaterloo.ca, Co-AUTHOR: **Brian Cozzarin**, University of Waterloo, bpcozzarin@uwaterloo.ca

ABSTRACT: We simulate the venture capital deal process under private information and use regressions to analyze the resulting synthetic data. We find teamwork between the entrepreneur and the venture capitalist to be crucial for the entrepreneur to receive an investment, and that the venture capitalist's confidence in the entrepreneur's performance works to the entrepreneur's advantage. We also find that a higher base salary for the entrepreneur can be detrimental or beneficial to either party.

The Impact of the Venture Capitalist on the Entrepreneurial Innovation Process

PRESENTING AUTHOR: **Sinan Erzurumlu**, Babson College, serzurumlu@babson.edu Co-AUTHORS: **Nitin Joglekar**, Boston University, joglekar@bu.edu, **Fehmi Tanrisever**, Technische Universiteit Eindhoven, f.tanrisever@tue.nl

ABSTRACT: In the relationship between a Venture Capitalist (VC) and the startup, as much as the entrepreneur seeks funds, VC should provide sufficient level of advising. We study the impact of the characteristics of the VC as well as financing on the entrepreneurial venture to determine the right type of investor for the startup. Depending on the financier's level of advising and the stage of the project, the startup is better off working with different types of investors.

SB: 11:00 - 12:30 Innovation and Entrepreneurship II: Entrepreneurial Process

CHAIR: **Sinan Erzurumlu**, Babson College, serzurumlu@babson.edu

Returns to Entrepreneurship in the Market Process: A Simulation Study

PRESENTING AUTHOR: **Mohammad Keyhani**, York University, mkeyhani08@schulich.yorku.ca, Co-AUTHORS: **Moren Lévesque**, York University, MLEvesque@schulich.yorku.ca, **Anoop Madhok**, York University, AMadhok@schulich.yorku.ca

ABSTRACT: We study the notion of entrepreneurial rent and consider what it means to calculate returns to entrepreneurship. We use cooperative game theory to model creation and discovery entrepreneurship and computer simulation to measure returns to these types of entrepreneurship in a dynamic market process. We compare returns to different kinds of entrepreneurship when other market participants have different entrepreneurial capabilities, and consider implications for entrepreneurship strategy.

Incentives for Collaborative and Cross-Functional Teams

PRESENTING AUTHOR: **Jeremy Hutchison-Krupat**, Georgia Institute of Technology, Jeremy.Hutchison-Krupat@mgt.gatech.edu

ABSTRACT: Metrics drive behavior. The ensuring that a team's performance metrics induce the most profitable

actions is a critical step in the implementation of a project. In this paper, we characterize when a manager should choose to implement performance metrics for a project team based on either, incomplete (but direct) observable measures of each functional unit's contribution to profit, or a complete (but indirect) measure of the entire team's contribution to profit.

Knowledge Creation from Exploration and Exploitation in the High-Tech Venture

PRESENTING AUTHOR: **Jennifer Bailey**, Georgia Institute of Technology, Jennifer.Bailey@mgt.gatech.edu, Co-AUTHOR: **Cheryl Gaimon**, Georgia Institute of Technology, Cheryl.Gaimon@mgt.gatech.edu

ABSTRACT: It has been recognized that organizations can derive significant benefits from simultaneously learning from both exploration and exploitation in the innovation development process. We introduce a model to develop normative guidelines on the efficient allocation of resources for knowledge creation in the context of a high-tech entrepreneurial venture.

Introduction of Innovations by Start-up Firms

PRESENTING AUTHOR: **Karthik Ramachandran**, Southern Methodist University, karthik@mail.cox.smu.edu, Co-AUTHORS: **Sreekumar Bhaskaran**, Southern Methodist University, sbhaskar@mail.cox.smu.edu, **Sinan Erzurumlu**, Babson College, serzurumlu@babson.edu

ABSTRACT: Startups can often launch a first version of their product and use the revenues to fund the costly development of a better, but risky, focal product. However, this might adversely affect profits from the focal product itself. We develop a dynamic model of such situations and identify the optimal product launch and development decisions of the start-up firm. We further consider the impact of learning about technological and market parameters on the launch and development decisions.

SC: 13:30 - 15:00 Innovation in Platform Systems

CHAIR: **Edward Anderson**, University of Texas-Austin, Edward.Anderson@mcombs.utexas.edu

An Early Look at Large Numbers of Software Apps Developers and Patterns of Innovation

PRESENTING AUTHOR: **Kevin Boudreau**, London Business School, kboudreau@london.edu

ABSTRACT: I study software producers building applications for leading handheld computer platforms. I find a lock-step link between numbers of producers and varieties of software titles as well as pronounced specialization and heterogeneity. I also find that adding producers stimulates investment incentives consistent with network effects, but also crowds out innovation incentives. Overall, innovation became more dependent on population-level diversity and variation rather than individual innovators.

Internal Knowledge Markets

PRESENTING AUTHOR: **Marshall Van Alstyne**, Boston University, mva@bu.edu, Co-AUTHOR: **Hind Benbya**, GSMC Montpellier Business School, benbya@gmail.com

ABSTRACT: Internal markets can improve sharing, forecasting, innovation, and productivity. Despite their popularity, firms have struggled to implement them. We provide a platform framework that applies standard economic theories - on prices, money supply, and networks - to design information exchanges inside firms. Much prior work on "knowledge management" has been atheoretical such that management practice can benefit from theories that have much to say about movement and value of information.

Adoption of a Two-tier Internet

PRESENTING AUTHOR: **Barrie R. Nault**, University of Calgary, nault@ucalgary.ca, CO-AUTHOR: **Steffen Zimmermann**, University of Innsbruck, Steffen.Zimmermann@uibk.ac.at

ABSTRACT: An open and uncontrolled public Internet is subject to congestion and security threats, imposing negative externalities on users. The evolution to a two-tier (public and private) Internet is effectively a technology adoption and conversion problem. We develop a model of technology conversion towards a two-tier Internet that captures benefits and costs facing firms with choices of public versus private, the impact on industry profitability and social welfare, and the role of a planner.

Integration Investment in Emerging Complementary Markets through Cospecialization

PRESENTING AUTHOR: **Edward Anderson**, University of Texas-Austin, Edward.Anderson@mcombs.utexas.edu, CO-AUTHOR: **Geoffrey Parker**, Tulane University, gparker@tulane.edu

ABSTRACT: Using system dynamics, we explore the decisions an immature startup must make when entering a market with strong complementarities: financing structure, overall investment level in cospecializing to complementary technologies, and allocation of that investment. All technological trajectories are uncertain. Monte Carlo analysis is used to determine general trends. One trend that stands out is a preference for investing in at most one complementary technology rather than multiple technologies.

SD: 16:30 - 18:00 Determinants of Project Team Performance

CHAIR: **Bradley Staats**, University of North Carolina-Chapel Hill, bstaats@unc.edu

Using What We Know: Turning Organizational Knowledge into Team Performance

PRESENTING AUTHOR: **Bradley Staats**, University of North Carolina-Chapel Hill, bstaats@unc.edu, CO-AUTHORS: **Amy Edmondson**, Harvard Business School, aedmondson@hbs.edu, **Melissa Valentine**, Harvard Business School, mvalentine@hbs.edu

ABSTRACT: We examine how teams draw on knowledge resources in the firm in the production of output. We theorize positive effects of team use of an organizational knowledge repository on team performance, and argue that these effects will be greater when teams face structural characteristics that intensify the challenge of knowledge integration. We also examine how use in the team is

concentrated across team members. We test our hypotheses with data from an Indian software services firm.

See the Forest for the Trees: Adaptive Learning within Product Development Scenarios

PRESENTING AUTHOR: **Nitin Joglekar**, Boston University, joglekar@bu.edu, CO-AUTHOR: **Leonardo Santiago**, Federal University of Minas Gerais, lsantiago@ufmg.br

ABSTRACT: Scenario planning (Kahn 1973) fosters adaptive learning in organizations (De Geus 1988). We develop a model to compare alternative learning strategies in the face of rapidly evolving information associated with product development projects and their parent portfolio scenarios.

Realizing the Need for Rework in Product Development: From Task Interdependence to Social Networks

PRESENTING AUTHOR: **Manuel Sosa**, INSEAD, manuel.sosa@insead.edu

ABSTRACT: We characterize interpersonal knowledge transfers that uncover the need for design rework. We find that developers attracted by task interdependence and separated by distinct knowledge bases are more likely to realize the need for rework. In addition, the social attachment of interacting actors has decreasing marginal returns on rework realization.

Outsourcing Innovation: Organizational Models in the Offshoring of R&D Services

PRESENTING AUTHOR: **Saikat Chaudhuri**, University of Pennsylvania, saikatc@wharton.upenn.edu, CO-AUTHOR: **Phanish Puranam**, London Business School, ppuranam@london.edu

ABSTRACT: While extant research on outsourcing has largely studied routinized tasks, firms are now offshoring higher-end work entailing greater uncertainty. We test how well the Global Delivery Model transfers to such functions, by analyzing a sample of global R&D projects conducted by a leading Indian outsourcing vendor. We find that an adapted organizational design can mitigate the negative impact higher ex-ante uncertainty has on performance. The results question traditional notions of firm boundaries.

Monday, November 14

MA: 08:00 - 09:30 Innovation and Entrepreneurship III: Growth

CHAIR: **Jane Davies**, University of Cambridge Judge Business School, j.davies@jbs.cam.ac.uk

The Optimal Time-money Tradeoff in Growth Oriented Entrepreneurial Firms

PRESENTING AUTHOR: **Onesun Steve Yoo**, University College London, onesun.yoo@ucl.ac.uk, CO-AUTHORS: **Charles Corbett**, University of California-Los Angeles, charles.corbett@anderson.ucla.edu, **Guillaume Roels**, University of California-Los Angeles, groels@anderson.ucla.edu

ABSTRACT: We present a formal model of hiring characterizing the entrepreneurial setting, identify the key

tradeoffs, and provide prescriptions for the timing of hiring decisions. We show that the shadow value of time becomes greater than the shadow value of money during the growth phase, making time the key bottleneck resource. Characterizing hiring as an exchange of money with time, we identify the optimal hiring cash threshold, its nonmonotonicity with respect to the setup time, and present insights.

Effective Managerial Approaches to Commercializing Radical Innovation via Corporate Venturing

PRESENTING AUTHOR: **John Angelis**, Rochester Institute of Technology, jangelis@saunders.rit.edu, CO-AUTHOR: **Richard DeMartino**, Rochester Institute of Technology, rdemartino@saunders.rit.edu

ABSTRACT: Although there is widespread agreement that corporate venturing plays a critical role in the commercialization of radical innovations, little is known concerning effective venturing approaches. The existing literature does not distinguish how methods should change when corporate venturing initiatives employ radical innovation instead of incremental. The purpose of this paper is to outline general management approaches to facilitate the use of venturing to commercialize radical innovation.

Innovation Diffusion and Firm Growth

PRESENTING AUTHOR: **Jane Davies**, University of Cambridge Judge Business School, j.davies@jbs.cam.ac.uk, CO-AUTHOR: **Moren Lévesque**, York University, MLevesque@schulich.yorku.ca

ABSTRACT: We investigate whether growth in innovation adoption relates to firm investments in resources. Given the stage of innovation, we characterize which investments must grow to yield additional adopters. Since models of firm growth neglect the demand side (market adoption) while models of diffusion neglect the supply side (firm capabilities to meet demand), we contribute by offering and empirically testing a counterpart to Bass innovation-diffusion model that considers firm investment decisions.

MB: 11:00 - 12:30 Knowledge Learning and Intellectual Capital (KLIC)

CHAIR: **Charles Weber**, Portland State University, webercm@gmail.com

Experiments on Workaround Behaviors

PRESENTING AUTHOR: **Anita Tucker**, Harvard University, atucker@hbs.edu

ABSTRACT: A series of laboratory experiments on workaround behaviors were conducted to understand the conditions under which employees will seek to address the underlying system problem rather than just working around obstacles.

The Impact of Learning-curve Heterogeneity and Workload on Orthopedic Procedure Times

PRESENTING AUTHOR: **Michael Lapre**, Vanderbilt University, michael.lapre@owen.vanderbilt.edu, CO-AUTHOR: **David Moore**, Stanford School of Medicine, dwmooore@stanford.edu

ABSTRACT: Prior studies of service times have investigated

the impact of (1) individual, team, and organizational learning; (2) learning-curve heterogeneity; and (3) workload. However, evidence for each factor has been reported without controlling for the other factors. We study the combined impact of all three factors on orthopedic procedure times.

Knowledge in Multi-Disciplinary Teams

PRESENTING AUTHOR: **Zeynep Erden**, ETH Zurich, zerden@ethz.ch, CO-AUTHORS: **Andreas Schneider**, ETH Zurich, andreasschneider@ethz.ch, **Georg von Krogh**, ETH Zurich, gvkrogh@ethz.ch

ABSTRACT: Prior research accepted and repeatedly emphasized that communication and collaboration across various scientific domains critically depend on distinct levels of overlap between their knowledge bases. However, less is known on different types of knowledge and shared experience across scientists in multidisciplinary teams. The purpose of this research project is to close this gap by gaining an in-depth understanding on the nature of knowledge in multidisciplinary teams.

Towards a Knowledge-Based View of the Nation

PRESENTING AUTHOR: **Charles Weber**, Portland State University, webercm@gmail.com, CO-AUTHOR: **Patravadee Ploykitikoon**, Portland State University, ppatravadee@hotmail.com

ABSTRACT: A study of the national laboratories in Thailand suggests that different success factors affect national absorptive capability at different stages of the R&D process. Many of the concepts of the Knowledge-Based View of the Firm can be applied at the national level.

MC: 13:30 - 15:00 Joint Session TMS/NPD: Meet the Editors

CHAIR: **Cheryl Druehl**, George Mason University, cdruehl@gmu.edu
CO-CHAIR: **Raul Chao**, University of Virginia, ChaoR@darden.virginia.edu

Panel Discussion: Meet the Editors and Ask Them Questions

PANEL MEMBERS: **Cheryl Gaimon**, Georgia Tech, POM Journal, Management of Technology Dept Editor; **Dan Guide**, Penn State, Journal of Operations Management, Co-Editor-in-Chief & POM Journal, Sustainable Operations Dept Editor; **Stylianos Kavadias**, Georgia Tech, POM Journal, New Product Development, R&D & Project Mgmt Dept Editor; **Kamalini Ramdas**, London School of Business, Management Science, Entrepreneurship & Innovation Dept Editor; **Asoo Vakharia**, University of Florida, Editor, Decision Sciences Journal

MD: 16:30 - 18:00 Joint Session TMS/NPD: TMS Distinguished Speaker

CHAIR: **Janice Carrillo**, University of Florida, jc@ufl.edu

Technology Management Section (TMS) Distinguished Speaker

PRESENTING AUTHOR: **Linda Argote**, Carnegie Mellon University, argote@cmu.edu

ABSTRACT: Professor Linda Argote will join us this year as the TMS Distinguished Speaker. Professor Argote is the David M. and Barbara A. Kirr Professor of Organizational Behavior and Theory, and also the Director for the Center for Organizational Learning, Innovation and Knowledge at CMU. Professor Argote is an expert in the areas of organizational learning, transactive memory, and knowledge transfer. She will share her insights on these topics with members of the TMS community.

Tuesday, November 15

TA: 08:00 - 09:30 Technological Resources: (Re)configuration and Forecasting

CHAIR: **Juliana Hsuan**, Copenhagen Business School, jh.om@cbs.dk

A Multivariate Analysis of Sales Data

PRESENTING AUTHOR: **Eric Bentzen**, Copenhagen Business School, bentzen@cbs.dk

ABSTRACT: In this paper we use multiple time series to forecast the future sales, and we apply multi-equation models as an extension of regression models and simultaneous equation systems. Because we use multi-equation models we can consider a larger system which includes moving-holiday (Easter), and Christmas.

The Impact of Management Heuristics on the Selection and Allocation of Resources in an R&D Portfolio

PRESENTING AUTHOR: **Leonardo Santiago**, Federal University of Minas Gerais, lsantiago@ufmg.br, CO-AUTHOR: **Leonardo Tavares**, Federal University of Minas Gerais, leortavares@gmail.com

ABSTRACT: We discuss the impact of heuristics commonly used by decision-makers during the process of forming an R&D portfolio. We consider simple ad hoc rules to select design alternatives and allocate resources during the development process of new technologies and compare their performance with respect to the overall portfolio value.

Managing Modularity of Service Process Architecture

PRESENTING AUTHOR: **Thomas Frandsen**, Copenhagen Business School, tf.rom@cbs.dk, CO-AUTHOR: **Juliana Hsuan**, Copenhagen Business School, jh.om@cbs.dk

ABSTRACT: Modularity has been suggested as a way to reduce complexity and enable re-configurability in the design of service systems. However modularity paradoxically also introduce new complexities requiring management attention. We use case research to study this paradox and apply the service modularity function to capture degrees of modularity in service process architecture. We show how managers in their design efforts use management technologies to address the dilemmas they face.

The Third Capability: Asset Reconfiguration, Renewal and Learning from Stakeholders

PRESENTING AUTHOR: **Stefan Hafliger**, ETH Zurich, shaefliger@ethz.ch, CO-AUTHORS: **Fotini Pachidou**, ETH Zurich, **Georg von Krogh**, ETH Zurich, gvkrogh@ethz.ch

ABSTRACT: With fundamental discoveries becoming rare in

mature industries, the need to reconfigure existing assets receives more attention. The third dynamic capability focuses on the reconfiguration and renewal of existing assets and describes how such a reconfiguration may contribute to sustaining the performance of tangible and intangible assets. The market for mature drugs offers variance in the success of asset renewal activity and we study the treatment of Alzheimer's disease.

TB: 11:00 - 12:30 Idea Generation and Problem Solving in Innovation Contests

CHAIR: **Anant Mishra**, George Mason University, amishra6@gmu.edu

Managing Delegated Search over Design Spaces

PRESENTING AUTHOR: **Sanjiv Erat**, University of California-San Diego, serat@ucsd.edu, CO-AUTHOR: **Vish Krishnan**, University of California, vkrishnan@ucsd.edu

ABSTRACT: Organizations increasingly seek solutions to their open-ended design problems by employing a contest approach in which search over a solution space is delegated to outside agents. We develop an analytical model to examine the determinants of breadth of solution space searched by outside agents. The model explains clustering of searchers in specific regions of the solution space. Our results show that the breadth of search, while increasing in number of searchers, is sub-linear (logarithmic).

Idea Generation and the Role of Feedback

PRESENTING AUTHOR: **Joel Wooten**, University of Pennsylvania, jwooten@wharton.upenn.edu, CO-AUTHOR: **Karl Ulrich**, University of Pennsylvania, ulrich@wharton.upenn.edu

ABSTRACT: In many innovation settings, ideas are generated over time and managers face a decision about if and how to provide in-process feedback about the quality of submissions. We use innovation tournament field experiments to examine the effect of feedback on idea generation and show individual-level differences between no feedback, random feedback, and directed feedback.

Participation Strategy, Experience and Likelihood of Winning in Unblind Innovation Contests

PRESENTING AUTHOR: **Anant Mishra**, George Mason University, amishra6@gmu.edu, CO-AUTHORS: **Jesse Bockstedt**, George Mason University, jbockste@gmu.edu, **Cheryl Druehl**, George Mason University, cdruehl@gmu.edu

ABSTRACT: We examine the dynamics of competition in "unblind" innovation contests—an increasingly popular format for innovation contests where solutions submitted by contestants as well as the feedback received on them are viewable by other contestants. Using data from 1024 logo design contests involving more than 45000 submitted entries and 2526 unique contestants, we explore the role of participation strategies and prior experience in the contest environment on the likelihood of winning a contest.

TC: 13:30 - 15:00 Coordination and Management of Knowledge

CHAIR: **Gulru Ozkan**, Clemson University, gulruo@clemson.edu

Knowledge Transfer and Knowledge Creation in New Product Development Projects

PRESENTING AUTHOR: **Wenli Xiao**, Georgia Institute of Technology, wxiao6@gatech.edu, CO-AUTHORS: **Janice Carrillo**, University of Florida, jc@ufl.edu, **Cheryl Gaimon**, Georgia Institute of Technology, Cheryl.Gaimon@mgt.gatech.edu

ABSTRACT: Two models are introduced depicting knowledge creation in prototyping, pilot line testing, and on-line experimentation. In both the manager decides the rate of development efforts at each stage. In one model knowledge is transferred to the next stage continuously as would be the case for a small co-located team. In the other model knowledge is accumulated and transferred at discrete times. We compare the optimal solutions to get insights on knowledge development and knowledge transfer strategies.

Cascading Operations Strategy: Balancing Delegation and Coordination

PRESENTING AUTHOR: **Fabian Sting**, Erasmus University, fsting@rsm.nl, CO-AUTHOR: **Christoph Loch**, INSEAD, c.loch@jbs.cam.ac.uk

ABSTRACT: We study strategy processes at six German manufacturing organizations using an organizational search perspective. While the final decision on strategic initiatives remains at the top, strategic initiatives are distributed across hierarchical levels, depending on where expertise is concentrated. The organizations also use multiple mechanisms to coordinate decentralized actors. Coordination and top-down decision making is weighed against the creativity that stems from delegated search.

Managing New Product Development Knowledge between Competing Firms

PRESENTING AUTHOR: **Gulru Ozkan**, Clemson University, gulruo@clemson.edu, CO-AUTHORS: **Cheryl Gaimon**, Georgia Institute of Technology, Cheryl.Gaimon@mgt.gatech.edu, **Sriram Venkataraman**, Clemson University, svenkat@clemson.edu

ABSTRACT: We introduce a two period stochastic game on KM for NPD of two competing firms. First, leader sets price for knowledge transfer (patents); follower decides how much knowledge to acquire. Next, firms pursue knowledge development (problem solving). Finally, both firms release new products. Insights include impact of uncertain market forces.

TD: 16:30 - 18:00 Innovation and Social Institutions

CHAIR: **Jaegul Lee**, Wayne State University, jaegul.lee@wayne.edu

The "DANCE" of Regulation and Innovation: Technology-Forcing in the U.S. Auto Industry, 1970-1995

PRESENTING AUTHOR: **Jaegul Lee**, Wayne State University, jaegul.lee@wayne.edu

ABSTRACT: This research examines the interaction between government and industry in shaping the technology-forcing regulatory process and the resulting technological outcomes. Using archival data associated from U.S. automotive safety and emission control regulation, we found that the government logic is significantly related to the direction of dominant technologies and the industry logic potentially impedes the regulatory process by introducing contestation among potential technological options.

The Dynamics of Social Contagion in Digital Service Platforms: A Comparative Analysis of Two Social Networking Sites

PRESENTING AUTHOR: **Kalle Lyytinen**, Case Western Reserve University, kalle@case.edu

ABSTRACT: Results of ethnographic interviews with technology executives and users of two social networking sites that have experienced dramatically different growth patterns suggest that fast growth of a digital service platform through social contagion requires the facilitation and balancing of three co-processes: co-valuation, co-production and co-creation. Our findings indicate the motivation of users to participate in co-creation of content is driven by voyeurism and exhibitionism and that the value of co-created content supersedes the economic value created by services.

Generative Tension and the Management of Infrastructural Innovation

PRESENTING AUTHOR: **Nicholas Berente**, University of Georgia, berente@uga.edu, CO-AUTHOR: **Jennifer Claggett**, University of Georgia, claggett@gmail.com

ABSTRACT: Through an exploratory field study of ten high-performance computing centers, we identified a variety of "generative tensions" associated with a particular form of innovation we describe as "infrastructural innovation." We develop a process model of dialectical modes of leadership and resource scarcity which result in organizational persistence and different forms of innovation.

The Impact of Enterprise Architecture (EA) Assimilation on Organizational Performance

PRESENTING AUTHOR: **George Makiya**, Case Western Reserve University, gmakiya@csc.com, CO-AUTHOR: **Kalle Lyytinen**, Case Western Reserve University, kalle@case.edu

ABSTRACT: This research examines the relationship between factors that influence Enterprise Architecture (EA) assimilation and the impact of EA assimilation levels on organizational performance. It addresses two questions: 1) what organizational and environmental factors influence the level of EA assimilation? 2) Does the level of EA assimilation affect an organization's performance?

Wednesday, November 16

WA: 08:00 - 09:30 Sustainability for Business Intelligence on Technology Management and New Product Development

CHAIR: **Hsueh Ming Stev Wang**, University of Alaska Anchorage, afhsw1@uaa.alaska.edu

An Innovated Healthcare System Engineering Program at Lehigh University

PRESENTING AUTHOR: **Hisham Abu-Nabaa**, Lehigh University, Hisham.Abunabaa@wilkes.edu

ABSTRACT: The new program provides solutions to healthcare's complex problems. HSE attempts to attract individuals with a strong knowledge base to optimize healthcare costs, while improving quality and performance. In an increasingly diverse, dynamic, and technology driven environment, the HSE program will provide solutions, such as innovative decision systems, inventory management, resource allocation, healthcare delivery, patient safety, and quality care.

Sustainable Risk Management for Arctic Offshore Oil & Gas Development

PRESENTING AUTHOR: **Seong Dae Kim**, University of Alaska Anchorage, afsdk1@uaa.alaska.edu

ABSTRACT: Arctic offshore development projects face additional challenges that are unique to the region. Because of their uniqueness and challenges, offshore drilling projects require better understanding of the risks and proper strategies to manage them given the challenges in responding to spills and other problems, as well as the high impact of many risks. This research will search for risk response strategies that achieve sustainability in Arctic offshore oil&gas development.

Analysis of Plasma Gasification Technology United States Patent Publications

PRESENTING AUTHOR: **Leslie Simmons**, University of Alaska, environmentalstreams@gmail.com

ABSTRACT: Plasma gasification technology inventions are submitted to United States Patent and Trademark Office (USPTO) agency. Analysis is about steps, methods, apparatus, efficiencies, and effectiveness that convert real-time and landfilled municipal, industrial, and hazardous waste feedstocks into sustainable energy-from-waste and resource recovery.

Manufacturing for Design and Sustainability

PRESENTING AUTHOR: **Hsueh Ming Stev Wang**, University of Alaska Anchorage, afhsw1@uaa.alaska.edu

Abstract: A systematical approach including the innovation of manufacturing technology for design to fit the markets' needs was analyzed through literature survey. The finding includes the justification of the competitive advantages of the successful new product design from the innovation of the advanced manufacturing technology. The innovation of the advanced manufacturing technologies for design link with the concepts of sustainability for the Least Rate Initial Production (LRIP).

WB: 11:00 - 12:30 Organizational Learning

CHAIR: **Charles Weber**, Portland State University, webercm@gmail.com

The Effect of Problem Population Demographics on Organizational Learning

PRESENTING AUTHOR: **Marcelo Pancotto**, IAE Business School, pancotto@iae.edu.ar

ABSTRACT: This paper contributes to research on organizational learning by defining and estimating metrics on problem population demographics, and testing their effect on quality improvement learning curves at 17 automobile assembly plants. Problem category frequency distributions follow a Power Law distribution, with high problem population diversity and low frequency counts even among the most frequent problems. These two problem population characteristics are associated to lower learning rates.

The Effect of Learning and Integration Investment on Manufacturing Outsourcing Decisions

PRESENTING AUTHOR: **Wenli Xiao**, Georgia Institute of Technology, wxiao6@gatech.edu, CO-AUTHOR: **Cheryl Gaimon**, Georgia Institute of Technology, Cheryl.Gaimon@mgt.gatech.edu

ABSTRACT: In a two-period game, a buyer determines the portion of demand to manufacture in-house versus outsource; the supplier determines the price and the investment in integration process improvement. The buyer realizes learning in its manufacturing and outsourcing costs. The supplier realizes learning in its manufacturing cost. We show how the supplier's price and integration investment decisions interact with the buyer's outsourcing decision and how both firms' decisions are impacted by learning.

Knowledge Management Strategies for Product and Process Design Teams

PRESENTING AUTHOR: **Gulru Ozkan**, Clemson University, gulruo@clemson.edu, CO-AUTHORS: **Cheryl Gaimon**, Georgia Institute of Technology, Cheryl.Gaimon@mgt.gatech.edu, **Stelios Kavadias**, Georgia Tech, Stylianios.Kavadias@mgt.gatech.edu

ABSTRACT: A manager's knowledge creation strategy for product and process design teams developing a single new product is examined. Knowledge development for each team and knowledge transfer between teams create knowledge that increase levels of product and process performance (after the errors in design knowledge is recovered) which in turn drive expected net revenue. Results include the impact of rates of recovery from errors and drivers of expected net revenue on dynamic knowledge creation strategies.

WC: 12:45 - 14:15 Investments in NPD Stages and Applications of Technologies

CHAIR: **Cheryl Druehl**, George Mason University, cdruehl@gmu.edu

Optimal Portfolio Strategies for New Product Development

PRESENTING AUTHOR: **Emre Nadar**, Carnegie Mellon

University, enadar@andrew.cmu.edu, CO-AUTHORS: **Laurens Debo**, University of Chicago, Laurens.Debo@chicagobooth.edu, **Alan Scheller-Wolf**, Carnegie Mellon University, awolf@andrew.cmu.edu

ABSTRACT: We study the problem of project selection and resource allocation in a multi-stage new product development process with exponential experimentation times, stage-dependent resource constraints, and Bayesian updating. We model the problem as an infinite-horizon Markov decision process, establishing the optimality of a new type of policy, non-congestive promotion. We numerically evaluate the effectiveness of our non-congestive promotion policy as a heuristic in a generic problem.

Optimal Investment in Product Support and New Product Development in Pharmaceutical Industry

PRESENTING AUTHOR: **Zhili Tian**, Washington University in St. Louis, tianzh@wustl.edu, CO-AUTHOR: **Panos Kouvelis**, Washington University in St. Louis, kouvelis@wustl.edu

ABSTRACT: A firm invests in the support of existing product and new product development. The first influences the adoption of the existing product while the second brings new product in the future market. The firm has to balance the investment in the two competing projects. We optimize the investment in these two types of projects. We estimate the new drug adoption model, which is a function of investment in different advertisement vehicles using drugs from Pfizer and the similar drugs in the market.

How Green is Nano?

PRESENTING AUTHOR: **José Lobo**, Arizona State University, Jose.Lobo@asu.edu, CO-AUTHOR: **Deborah Strumsky**, University of North Carolina at Charlotte, dstrumsky@unc.edu

ABSTRACT: Much of the interest in and support for nanotechnology research is motivated by the expectations that "nano" can play an important enabling role in the development of renewable energy, electric battery, green manufacturing, and environmental clean-up and remediation technologies. But how "green" is "nano"? Using a recently constructed concordance of "green" technologies for US patent data, we have explored how prevalent is the use of nanotechnology in green patented inventions.

A Classification Methodology for Network Sensors by Technological Class

PRESENTING AUTHOR: **Soumyo Moitra**, Software Engineering Institute, sdmoitra@hotmail.com

ABSTRACT: We consider network sensors used to monitor data traffic to detect anomalies and cyber attacks. Different classes of sensors represent different technological capabilities. From the perspective of network security, we develop a methodology to classify sensors. The aspects related to their features that are significant for network security are considered. A model is developed that assesses the effectiveness of sensors as a function of their features and capabilities.

**INFORMS – New Product Development
Charlotte, North Carolina 2011
Sponsored Program
(November 13 - 16, Sun - Wed)**

Raul Chao, Cheryl Druehl

Sunday, November 13

SA: 08:00 - 09:30 Collaboration in Innovation and Product Development Processes

CHAIR: **Sanjiv Erat**, University of California-San Diego, serat@ucsd.edu

Managing Product Transition under Technology Uncertainty

PRESENTING AUTHOR: **Sreekumar Bhaskaran**, Southern Methodist University, sbhaskar@mail.cox.smu.edu, CO-AUTHORS: **Ankur Goel**, Case Western Reserve University, axg312@case.edu, **Karthik Ramachandran**, Southern Methodist University, karthik@mail.cox.smu.edu

ABSTRACT: Sequential innovation creates several logistical challenges for innovating firms. Often, the end-of-life inventory decision for an existing product must be made before the technology uncertainty surrounding the new product is resolved. We jointly model these decisions, and

consider the effects of product architecture, development capability, operational flexibility and competition on the inventory decision.

The Effect of Correlated Information on the Negotiation Process of Licensing Agreements

PRESENTING AUTHOR: **Jerry He**, Cambridge University, xh232@cam.ac.uk, CO-AUTHOR: **Nektarios Oraopoulos**, Cambridge University, n.oraopoulos@jbs.cam.ac.uk

ABSTRACT: The vast majority of prior work on licensing agreements between pharmaceutical and biotech companies relies on the assumption of asymmetric information. In light of the remarkably high uncertainty that characterizes the drug development process, we argue that such information may not be available to either party. Instead, we study the efficiency of the licensing process when both parties receive imperfect, yet correlated, signals regarding the value of the drug candidate.

The Bargaining Nature of Product Development: Implications from Cross-Functionality

PRESENTING AUTHOR: **Stelios Kavadias**, Georgia Tech, Stylianos.Kavadias@mgt.gatech.edu, CO-AUTHOR: **Jeremy Kovach**, Georgia Institute of Technology, jeremy.kovach@mgt.gatech.edu

ABSTRACT: We explore how functional stakeholder interactions shape the outcomes of NPD projects. We focus on the milestone points during development, where product specifications are debated between marketing and engineering. Instead of the standard assumption of central project coordinators, we posit that NPD processes rely on the strategic interactions among the stakeholders. We develop a bargaining model to understand how organizational power, uncertainty, and performance metrics affect such decisions.

SB: 11:00 - 12:30 How Architectures matter: Their roles in Products, Processes, and Organizations

CHAIR: **Sebastian Fixson**, Babson College, sfixson@babson.edu

Degree Distribution and Quality in Complex Engineered Systems

PRESENTING AUTHOR: **Manuel Sosa**, INSEAD, manuel.sosa@insead.edu, CO-AUTHORS: **Tyson Browning**, Texas Christian University, t.browning@tcu.edu, **Jürgen Mihm**, INSEAD, jurgen.mihm@insead.edu

ABSTRACT: Complex engineered systems tend to have architectures characterized by a small subset of components (hubs) that are more highly connected than others. Based on a sample of open-source applications, we show that complex systems may have an optimal hub size with respect to system quality.

Predicting Technical Debts in Complex Software System Development

PRESENTING AUTHOR: **Alan MacCormack**, Massachusetts Institute of Technology, alanmac@mit.edu

ABSTRACT: Many studies show that measures of component complexity predict the defects experienced by components within a system. Most however, pay no attention to how components are arranged - that is, the role of system architecture. We study this relationship in a large system. We develop a model that predicts defects from the level of coupling between components. We use this model to predict the parts of the design that experience technical problems, in developing the next generation of the system.

Organizational Architecture in Evolving Contexts

PRESENTING AUTHOR: **Federica Ceci**, University G. d'Annunzio, f.ceci@unich.it, CO-AUTHOR: **Andrea Prencipe**, University G. d'Annunzio, a.prencipe@unich.it

ABSTRACT: Relying on an original dataset of 102 firms operating in the IT sector in Europe, our study identifies a curvilinear relationship between asset specificity and the typology of ties with suppliers: i.e. strong ties – e.g. joint venture or partnership – are found in presence of both low and high asset specificity. These results provide the basis for a reassessment of our understanding of organizational architecture of firms' operating in evolving context.

Strategies to Mitigate Negative Effects of Architectural Mismatches in Complex Product Development

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ABSTRACT: The literature has established the challenges for product development performance that are caused by mismatches between product architecture and organizational architecture. We develop a simulation game to test various strategies to mitigate the detrimental mismatch effects in the context of a complex product with an integral product architecture developed by firms forming a modular supply chain.

SC: 13:30 - 15:00 How Organization and Network Structure Impact Innovation

CHAIR: **Raul Chao**, University of Virginia, ChaoR@darden.virginia.edu

How to Exterminate Bugs Fast: Architecture, Experience and Bug Fixing Times

PRESENTING AUTHOR: **Jürgen Mihm**, INSEAD, jurgen.mihm@insead.edu, CO-AUTHORS: **Tyson Browning**, Texas Christian University, t.browning@tcu.edu, **Manuel Sosa**, INSEAD, manuel.sosa@insead.edu

ABSTRACT: The interplay between product characteristics and organizational characteristics influences product performance, yet this is not well understood. Based on a sample of open-source software projects, we study how the architecture of the product and the experience of the developing team affect the time to fix product defects.

Resource Allocation for New Product Development and the Value of Strategic Buckets

PRESENTING AUTHOR: **Jeremy Hutchison-Krupat**, Georgia Institute of Technology, Jeremy.Hutchison-Krupat@mgt.gatech.edu, CO-AUTHOR: **Stylianos Kavadias**, Georgia Institute of Technology, stelios@gatech.edu

ABSTRACT: Firms wishing to pursue strategic NPD initiatives, face several key challenges. Such initiatives are implemented within the context of an organizational hierarchy where strategic portfolio decisions are made at the top, but critical specialized knowledge resides lower down, with functional managers. Given this information asymmetry, we characterize when it is in the firm's best interest to maintain decision rights over project budgets or delegate such rights to functional managers.

Product Evolution and Platform Strategy: A Study of the Smartphone Industry

PRESENTING AUTHOR: **Rahul Basole**, Georgia Institute of Technology, rahul.basole@ti.gatech.edu

ABSTRACT: We examine how network structure, technology characteristics, and business model of a platform shapes interfirm coordination of smartphone launches in the global mobile device industry using a primary data set of 784 launches between 2003-2011. We complement our analysis with a visualization of the product-platform network evolution.

Equity Alliances in the Pharmaceutical Industry: Joint Ventures vs. Licensing Agreements

PRESENTING AUTHOR: **Niyazi Taneri**, University of Cambridge, n.taneri@jbs.cam.ac.uk, CO-AUTHOR: **Arnoud De Meyer**, Singapore Management University, arnouddemeyer@smu.edu.sg

ABSTRACT: We build a model of equity licensing with a view of understanding the choice between joint ventures and equity licensing contracts when forming alliances. The predictions of the model and two further hypotheses are tested with data from the pharmaceutical industry. The findings also shed light on the debate in the law literature on the enforceability of IP laws in emerging countries.

SD: 16:30 - 18:00 Innovation Strategy

CHAIR: **Karan Girotra**, INSEAD, karan@girotra.com

How Complexity Impacts Innovation

PRESENTING AUTHOR: **Raul Chao**, University of Virginia, ChaoR@arden.virginia.edu, CO-AUTHOR: **Elena Loutskina**, University of Virginia, LoutskinaE@arden.virginia.edu

ABSTRACT: A central element of technological search is distance relative to a firm's current position in the space of technological opportunity. In this study we develop a new metric for technological search distance and we empirically evaluate how organizational and financial complexity impact search distance for a large panel (22, 136 firm-years) of publicly traded firms. We find broad empirical evidence that both organizational and financial complexity drive companies to pursue more exploratory search.

Innovation in Services

PRESENTING AUTHOR: **Kamalini Ramdas**, London Business School, kramdas@london.edu, CO-AUTHORS: **Elizabeth Teisberg**, University of Virginia, TeisbergE@arden.virginia.edu, **Amy Tucker**, University of Virginia, ALT8T@hscmail.mcc.virginia.edu

ABSTRACT: We will present a framework for innovation in services and illustrate the framework using a variety of examples from different service sectors. The framework can be used to generate early stage ideas for service innovation, with a specific focus on service delivery innovation.

Do Words Speak Stronger than Actions?

PRESENTING AUTHOR: **Stelios Kavadias**, Georgia Tech, Stylianios.Kavadias@mgt.gatech.edu, CO-AUTHOR: **Jeremy Hutchison-Krupat**, Georgia Institute of Technology, Jeremy.Hutchison-Krupat@mgt.gatech.edu

ABSTRACT: A major challenge for senior management, when implementing innovation strategy, is to translate it into a tangible set of actions (project funding), despite incomplete knowledge of the future. We conceptualize strategy implementation as a communication game within a hierarchical organization to analyze this challenge. We characterize the interplay between senior management's actions (i.e. incentives) and "words" (i.e. the message sent), and the resulting funding for organizational initiatives.

Monday, November 14

MA: 08:00 - 09:30 Incentives in Innovation and Product Design

CHAIR: **Yi Xu**, University of Maryland, yxu@rhsmith.umd.edu

Social Network Effects on Product Design and Diffusion

PRESENTING AUTHOR: **Dilek Gunnec**, University of Maryland, dgunnec@rhsmith.umd.edu, CO-AUTHOR: **S. Raghavan**, University of Maryland, raghavan@umd.edu

ABSTRACT: We look at the effects of the structure of a social network on the design and diffusion of a product. A non-symmetric linear influence form among potential customers is assumed where one's "neighbors" have the same influence on him. We first analyze the optimal design of the product, and then optimize the diffusion process to maximize the market share of this product. Budgetary constraints are discussed and extensive numerical experiments are presented.

Challenges in New Service Design & Development

PRESENTING AUTHOR: **Stelios Kavadias**, Georgia Tech, Stylianios.Kavadias@mgt.gatech.edu, CO-AUTHOR: **Ioannis Bellos**, Georgia Tech, ioannis.Bellos@mgt.gatech.edu

ABSTRACT: Service offerings present a unique challenge: customers co-create the value of the outcome. Such co-production corresponds to identifying and matching the exact customer needs. The subjective and intangible nature of new service offerings amplifies the existing information asymmetries. We model the interactions (service encounters), between a customer and a service provider, as a process comprising distinct steps. Our results identify the main drivers behind the design of such encounters.

The 3C's of Outsourcing Innovation: Cost, Capability, and Control

PRESENTING AUTHOR: **Cheryl Druehl**, George Mason University, cdruehl@gmu.edu, CO-AUTHOR: **Gal Raz**, University of Virginia, razg@arden.virginia.edu

ABSTRACT: Using a newsvendor setting, we examine a two-stage supply chain. The buyer determines the degree of product innovation (increased value to consumers) and/or process innovation (cost reduction) and whether to outsource any (or both) these activities. We investigate the impact of Control (who makes decisions), Capability (who is better at the activity), and Cost (who is more economical) on the supply chain performance, the innovation investment, and the outsourcing decision.

Incentives, Outsourcing, and Product Quality Control Mechanisms

PRESENTING AUTHOR: **Yi Xu**, University of Maryland, yxu@rhsmith.umd.edu, CO-AUTHORS: **Yan Dong**, University of Maryland, yandong@rhsmith.umd.edu, **Sean Wan**, University of Maryland, xwan@rhsmith.umd.edu, **Kefeng Xu**, University Texas San Antonio, kefeng.xu@utsa.edu

ABSTRACT: This research aims to better understand the structural effects of quality control mechanisms in supply chains where a brand owner designs and markets a

product. The brand owner could either manufacture the product using a component provided by a supplier or out source the manufacturing entirely to a manufacturer. We studies two commonly adopted quality control mechanisms: supplier inspection and quality audit.

MB: 11:00 - 12:30 Innovation and the Global Economy

CHAIR: **Erica Fuchs**, Carnegie Mellon University, erhf@andrew.cmu.edu

Democratizing Scientific Communities? From Peer-to-Peer to Formal Organizations

PRESENTING AUTHOR: **Jeff Furman**, Boston University, furman@bu.edu, CO-AUTHOR: **Fiona Murray**, MIT, fmurray@mit.edu

ABSTRACT: The production of scientific knowledge is shaped through both informal structures and formal structures. In this paper, we take advantage of a series of natural experiments involving culture collections to investigate whether the introduction of a formal institution governing the exchange of research inputs has a democratizing impact on scientific production. We find that more open access leads to an expansion in the research community, particularly among lower status actors.

Economic Downturns, Technology Trajectories and the Careers of Scientists

PRESENTING AUTHOR: **Eyiwunmi Akinsanmi**, Carnegie Mellon University, eyiwunmi@cmu.edu, CO-AUTHORS: **Erica Fuchs**, Carnegie Mellon University, erhf@andrew.cmu.edu, **Ray Reagans**, Massachusetts Institute of Technology, reagans@mit.edu

ABSTRACT: This research explores the relationship between the telecommunications bubble burst and the rate and direction of U.S. innovation. We focus on "optoelectronics", a general purpose technology, and the emerging "integration" technologies that facilitate optoelectronics application to fields outside telecommunications. Using USPTO patents and inventor CVs, we analyze the relationship between an inventor's pre-bubble characteristics and his patenting post-burst and thereby the national trend.

When are there not Bubbles?

PRESENTING AUTHOR: **Brent Goldfarb**, University of Maryland, bgoldfarb@rhsmith.umd.edu, CO-AUTHOR: **David Kirsch**, University of Maryland, dkirsch@umd.edu

ABSTRACT: Many studies of financial manias and crises fail to compare times of turmoil to times of stability, and hence, by design, cannot ascertain root causes bubbles. We document financial and industrial histories and the presence or absence of speculation of a variety of new technologies introduced since 1880. Several factors are empirically associated with manias and crises: novice Investors, belief-coordinating events and market liquidity. We explore consequences of manias and policy implications.

Organizational Determinants of Technology Commercialization Strategy Given Greenfield Competition

PRESENTING AUTHOR: **Matt Marx**, MIT, mmarx@mit.edu

ABSTRACT: How do entrepreneurs select among alternative paths for commercializing new technologies? Past studies of technology commercialization strategy have focused primarily on the external environment, neglecting the role of organizational factors. We summon evidence from a census of the 645 speech recognition firms, and find that founders with experience in the technology are more likely to select a cooperative commercialization mode, and that they are more likely to evolve their strategy.

MC: 13:30 - 15:00 Coordinating Decentralized Innovation Processes

CHAIR: **Raul Chao**, University of Virginia, ChaoR@arden.virginia.edu

Pricing for Innovation & Investment in Digital Supply Chains

PRESENTING AUTHOR: **Ayhan Aydin**, University of Chicago, aaydin@chicagobooth.edu, CO-AUTHORS: **Dan Adelman**, University of Chicago, dan.adelman@chicagobooth.edu, **Rodney Parker**, University of Chicago, rodney.parker@chicagobooth.edu

ABSTRACT: Upstream providers in innovative industries, such as Internet, telecommunications and electronics, rely on their downstream customers' innovation and investment efforts. Motivated by digital supply chains and a major industrial partner, we ask the question; under competition is it possible for a firm to encourage its customers to invest in their products while still being able to recoup the benefits of doing so? We find the optimal pricing and investment strategies.

Customer-supplier Innovation Collaboration Based on the Optimal Allocation of Intellectual Assets

PRESENTING AUTHOR: **Li Shen**, Xi'an Jiaotong University, ecoshen@gmail.com, CO-AUTHORS: **Zizhen Geng**, Xi'an Jiaotong University, jenny@stu.xjtu.edu.cn, **Xinmei Liu**, Xi'an Jiaotong University, xmliu@mail.xjtu.edu.cn

ABSTRACT: Customer-supplier innovation collaboration in the service outsourcing project is usually invalid because of inefficient allocation of intellectual assets. We used the game theory to study the problem of customer-supplier innovation collaboration based on the optimal allocation of intellectual assets by introducing the reputation mechanism. We found when customers has long-term relationship with suppliers, the effect of the reputation mechanism enables the innovation cooperation occurs smoothly.

Dynamic Pricing and Innovation

PRESENTING AUTHOR: **Régis Chenavaz**, ESG Management School, rchenavaz@esg.fr

ABSTRACT: This article models the intertemporal behaviour of a firm that sets product prices and simultaneously invests in product and process innovation. The model shows that pricing policy follows the dynamic of production cost and that it is independent of the evolution of the product quality. Thus, process innovation, which reduces cost, is the main determinant of a firm's pricing policy over time.

Kick-starting Green Tech Innovation in the IP Commons

PRESENTING AUTHOR: **Daniel Greenia**, Stanford University, dgreenia@stanford.edu

ABSTRACT: IP commons (e.g. GreenXChange) are an emerging opportunity for firms to approach a diverse population of innovators to license technologies. Adoption of these technologies requires thoughtful contract designs that consider the market opportunity. To wit, we explore contract design when competitors and non-competitors alike are potential licensees and the future value of the green technology is uncertain.

MC: 13:30 - 15:00 Joint Session TMS/NPD: Meet the Editors

CHAIR: **Cheryl Druehl**, George Mason University, cdruehl@gmu.edu

CO-CHAIR: **Raul Chao**, University of Virginia, ChaoR@arden.virginia.edu

Panel Discussion: Meet the Editors and Ask Them Questions

PANEL MEMBERS: **Cheryl Gaimon**, Georgia Tech, POM Journal, Management of Technology Dept Editor; **Dan Guide**, Penn State, Journal of Operations Management, Co-Editor-in-Chief & POM Journal, Sustainable Operations Dept Editor; **Stylianos Kavadias**, Georgia Tech, POM Journal, New Product Development, R&D & Project Mgmt Dept Editor; **Kamalini Ramdas**, London School of Business, Management Science, Entrepreneurship & Innovation Dept Editor; **Asoo Vakharia**, University of Florida, Editor, Decision Sciences Journal

MD: 16:30 - 18:00 Joint Session TMS/NPD: TMS Distinguished Speaker

CHAIR: **Janice Carrillo**, University of Florida, jc@ufl.edu

Technology Management Section (TMS) Distinguished Speaker

PRESENTING AUTHOR: **Linda Argote**, Carnegie Mellon University, argote@cmu.edu

ABSTRACT: Professor Linda Argote will join us this year as the TMS Distinguished Speaker. Professor Argote is the David M. and Barbara A. Kirr Professor of Organizational Behavior and Theory, and also the Director for the Center for Organizational Learning, Innovation and Knowledge at CMU. Professor Argote is an expert in the areas of organizational learning, transactive memory, and knowledge transfer. She will share her insights on these topics with members of the TMS community.

Tuesday, November 15

TA: 08:00 - 09:30 Empirical Work in New Product Development, Innovation and R&D Management

CHAIR: **Bilal Gokpinar**, University College London, b.gokpinar@ucl.ac.uk

Risk Management in Complex Information Technology (IT) Programs: The Role of Process Maturity

PRESENTING AUTHOR: **Anant Mishra**, George Mason University, amishra6@gmu.edu, CO-AUTHORS: **Sidhartha Das**, George Mason University, sdas@gmu.edu, **James Murray**, Lockheed Martin, james.j.murray.iii@lmco.com

ABSTRACT: Organization-wide IT initiatives are frequently organized in the form of complex IT programs that involve multiple projects spanning diverse knowledge bases and a number of partners. Managing risks in such programs is a matter of serious concern for managers. Using time series panel data collected from 75 IT programs within a global high technology firm, this study identifies a set of program completion risks and examines the role of process maturity (SEI-CMMI) level in mitigating such risks.

Knowledge Diversity, Turnover and Team Performance: An Empirical Analysis

PRESENTING AUTHOR: **Sriram Narayanan**, Michigan State University, sriram@msu.edu, CO-AUTHORS: **Jayashankar Swaminathan**, University of North Carolina at Chapel Hill, msj@unc.edu, **Srinivas Talluri**, Michigan State University, talluri@bus.msu.edu

ABSTRACT: We examine the role of diversity as separation and diversity as variety in determining team level productivity in the context of software maintenance. Our analysis focuses on two key diversity metrics: diversity as separation and diversity as variety. In addition to examining the impact of diversity on team productivity, we seek to better understand the interplay between diversity measures and show how different attributes of diversity assist/ deter team level productivity when turnover occurs.

The Effects of Feedback and Organizational Learning on Product Design and Development

PRESENTING AUTHOR: **Bilal Gokpinar**, University College London, b.gokpinar@ucl.ac.uk

ABSTRACT: The iterative process of product design and development does not come to an end once the product reaches the market. Instead, companies learn a great deal about their products from their customers, distributors and regulatory bodies after their products are on the market. In this study, by combining two unique data sets, we examine the role of these different feedback mechanisms on organizational learning and their effects on subsequent design and development efforts.

Unsolicited Customer Input (UCI) and New Service Development (NSD)

PRESENTING AUTHOR: **Amitkumar Kakkad**, London Business School, akakkad.phd2005@london.edu

ABSTRACT: This paper examines the role of Unsolicited Customer Input (UCI) in NSD & Service Innovation (SI). Extant literature has mostly explored Solicited Customer Input (SCI) in the context of NSD, whereas UCI has largely been studied only in the context of service recovery. This paper analyzes the role that UCI can play in NSD and SI through multiple case studies and a large-scale survey of service firms. Results strongly support the model proposed and lead to many promising ideas for future research.

TB: 11:00 - 12:30 New Methods in Managing Innovation

CHAIR: **Christoph Loch**, INSEAD,
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Product Specification Bargaining and Project Failure

PRESENTING AUTHOR: **Zhijian Cui**, IE Business School,
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ABSTRACT: Typically, product specifications in NPD projects are the result of a bargaining among several parties (such as R&D and marketing) specification decision-making; a failure to find an agreement sometimes results in project delays or cancellations. In a bargaining model, we study three levers to reduce the cancellation risk: signaling of abandonment costs, adjusting the stakes, and status concerns. We find that all three may reduce the cancellations risk, but only under specific conditions.

Managing Risk and Responding to Uncertainty: A Comparison of Startups in Three Countries

PRESENTING AUTHOR: **Christoph Loch**, INSEAD,
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ABSTRACT: Unforeseeable uncertainty requires startups to be flexible (parallel trials and experimentation). We show that flexibility empirically improves performance in three countries, Israel, Singapore and China, but it is too rarely applied: (A) startups do not explicitly manage uncertainty, and (B) investors do not provide the necessary support. Startups should upgrade their response to uncertainty, and investors should evaluate startup actions by uncertainty resolution rather than by "progress".

Meeting Project Deadlines under Uncertainty: An Alternative to the Critical

PRESENTING AUTHOR: **Fabian Sting**, Erasmus University,
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ABSTRACT: We present a case of a company that has developed an effective alternative system to Critical Chain project management. The system is based on fast problem resolution that offers project workers support and increases cross-task collaboration. At the same time, it reduces project workers' tendency to create individual time buffers. After its implementation, the company's project performance improved. We analyze the key components of the system and show how it differs from Critical Chain.

TMS Past Chairs

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2010 - David Moore
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2007 - Moren Lévesque
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Interested in running for TMS Office?
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