Dear Colleagues,

I hope the 2009 TMS Newsletter finds everyone doing well, and looking forward to interacting with TMS colleagues during the INFORMS annual meeting in San Diego this October 11-14. The current article reviews several important projects TMS officers and other TMS members have completed for our section during the past year. In some cases, these projects have been detailed in other Newsletter articles, identified herein.

The Technology Management Section concluded 2008 by electing Nile Hatch as our new Vice Chair of Membership and Communications. Nile engaged in several communications-related projects for TMS during 2009, including improving the language describing TMS in the INFORMS Guide to Subdivisions and producing the 2009 TMS newsletter. Vice Chair of Programs Juliana Hsuan made easy work of what has historically been a difficult task, assembling an enticing TMS program for the upcoming annual meeting. Highlights include a student presentation session scheduled for Wednesday, 14 October. Juliana describes the 2009 TMS program details in her newsletter article.

Chair-Elect Janice Carrillo organized the 2009 TMS best dissertation award competition and chaired the judging committee. Congratulations to TMS Best Dissertation Award winner Brian Fifarek and runner-up Philipp Tuertscher. Our sincere gratitude also goes out to the best dissertation award committee, including Vareska van de Vrande, Andrew Nelson, Glen Schmidt, and Cheryl Druehl. Janice provides the details regarding the competition, winner and runner-up in her newsletter article. Plaques will be presented to the winner and runner-up during the TMS business meeting on Monday, 12 October, 18:00 – 19:30.

Past Chair Francisco Veloso arranged for Professor Marvin Lieberman of UCLA to enlighten and entertain TMS members as our 2009 TMS Distinguished Speaker. We are excited to announce that Professor Lieberman will speak on Monday, 12 October beginning at 16:30 in the TMS conference room. Francisco has written a biographical newsletter article describing Professor Lieberman's many accomplishments, and also previewing his distinguished speaker presentation, “Perspectives on Technology and Market Entry: Themes from Business Strategy”. We thank Professor Marvin Lieberman for his service and presentation, which I hope everyone will be able to attend and enjoy.

Continued on page 27:

SAN DIEGO BUSINESS MEETING

The Technology Management Section business meeting will be held on Monday, October 12, at 6:00 pm. Please join the TMS officers and other distinguished colleagues for a wine and cheese reception after the meeting.
This year the Technology Management Section honors a veteran TMS member, a familiar face in TMS conference sessions, an outstanding mentor of students and junior faculty, and an intellectual leader and pillar of the technology management community.

We are delighted to announce that Professor Cheryl Gaimon has won the Distinguished Service Award for the Technology Management Section (TMS) this year. We recognize Professor Gaimon for her numerous contributions to the Technology Management community, including her tremendous body of research, her participation at conferences (including serving as our distinguished speaker in 2007), and her tireless support of junior faculty. Professor Gaimon has been a pillar of TMS over the years, as she continues to actively contribute to the TMS program. She has also mentored numerous junior faculty members, both within her university and throughout the operations management community. Many of Professor Gaimon’s former students remain active in TMS as faculty.

Professor Gaimon currently holds the Richard and Carol Kalikow Professorship and is also a Regents’ Professor in the College of Management at the Georgia Institute of Technology. She was a core participant in the development of an interdisciplinary program in the Management of Technology (MOT) and currently serves as that program’s director. She has taught courses in Technology Management at the undergraduate, masters, and PhD levels as well as in executive education programs at Georgia Tech. In addition, she has served in numerous editorial positions and is currently the Department Editor for the Management of Technology area for the POM journal.

Professor Gaimon’s commitment to research excellence is exemplary and continues to inspire TMS members. Her research methods involve elegant mathematical models of complex dynamic systems, and yield clear and valuable insights for managers and academics alike. Her research focuses on the strategic acquisition of new technology (manufacturing and information technology), knowledge creation and knowledge management, process improvement, implementation of new technology and new product development. Her research articles have appeared in refereed journals including Management Science, Operations Research, Production and Operations Management, Institute of Industrial Engineers (IIE) Transactions, Naval Research Logistics, European Journal of Operational Research, International Journal of Flexible Manufacturing Systems, and Decision Sciences.

The Technology Management Section exists to advance technology management scholarship. Professor Gaimon’s contributions and leadership set high standards and provide an inspirational example TMS truly appreciates and values.
Perspectives on Technology and Market Entry: Themes from Business Strategy
by Marvin B. Lieberman

The TMS Distinguished Speaker
— Francisco Veloso

We are pleased to announce that Professor Marvin Lieberman is the Distinguished Speaker for the Technology Management Section (TMS) at the Fall INFORMS 2009 conference. Professor Lieberman is currently a Professor of Policy in the Anderson School at UCLA. We would like to recognize his significant contributions to the field of Technology Strategy and Management throughout his career. Professor Lieberman received his B.A. and Ph.D. degrees from Harvard University. After graduating, he became an Assistant Professor of Business Policy in the Graduate School of Business at Stanford University, where he stayed until 1990. Since then, he has been on the faculty at UCLA.

Professor Lieberman has broad teaching and research interests, having made important contributions in fields as diverse as competitive strategy, industrial economics, and operations management. Within these extensive areas, two topics probably stand out in terms of impact: the learning curve and first mover advantages, subjects where he has published several landmark papers. His SMJ article aptly entitled “First Mover Advantages” (co-authored with D. Montgomery) was awarded the 1996 Best Paper Prize by the Strategic Management Society and has currently over 500 citations. Professor Lieberman has also published a set of influential papers on productivity and has recently focused on comparing the performance of U.S. and Japanese manufacturing firms.


In his talk, Professor Lieberman will focus on connections between technological change—radical and incremental—and market entry. He will provide an integrated perspective, connecting topics such as first-mover advantage, industry life cycle, disruption, mode of entry, imitation processes, strategic entry deterrence, and implications of the learning curve. In addition, he will present some findings from his recent work. Please come and join us for our distinguished speaker session in San Diego!
Brian Fifarek Wins 2009 TMS Doctoral Dissertation Award

Phillip Tuertscher is the Runner-up — Congratulations!

— Janice Carrillo

This year, there were several top notch dissertations submitted for consideration for the annual TMS best dissertation award. The dissertations addressed a wide variety of current technology related topics including organizational learning, design, information technologies, and technology strategy. It was refreshing to see the depth and breadth of the topics addressed by these new researchers and to get a glimpse into the future of our TMS research community. My thanks to the judges including Vareska van de Vrande, Andrew Nelson, Glen Schmidt, and Cheryl Druehl.

The winner of the Best Dissertation Award this year is Brian Fifarek. His dissertation is entitled, “Globalization, Offshoring, and the Location of Innovation: A Case Study of Rare Earth Technology.” Brian completed his studies at Carnegie Melon University, and the advisors for Brian’s dissertation were Professor Francisco Veloso (Chair) and Professor Cliff Davidson (Co-Chair). This thesis uses the rare earth elements industry as a case study to explore the long term impact of globalization and innovation on the location of innovation.

Brian is currently an Engineering Supervisor for Eaton Corporation’s Cutler-Hammer Industrial Controls Division located in Milwaukee, WI. The Division’s global engineering development team has resources in Milwaukee, China, and the Dominican Republic. He has responsibility for the new product development of solid state and electro-mechanical power control products. These products use embedded firmware systems to control functionality of switches, motors, solenoids, and industrial communications such as Fieldbus and Ethernet protocols. He is also a participant in the Engineering Technology Leadership Program which is designed to produce the next generation of technical leaders through significant contact with Eaton’s key innovation and technology leaders. He lives with his wife (Megan), daughter (Claire) and son (Elliott).

The runner up for the Best Dissertation Award this year is Philipp Tuertscher. His dissertation is entitled, “The Emergence of Architecture in Modular Systems: Coordination Across Boundaries at Atlas, CERN.” Philipp completed his studies at the University of St. Gallen where his dissertation chair was Professor Georg F. von Krogh. Philipp studied the development of ATLAS, a complex technological system that is being developed at CERN (the European Organization for Nuclear Research) to investigate questions concerning technological architecture.

Philipp is currently a researcher at the E&I Institute for Entrepreneurship and Innovation at the Vienna University of Economics and Business Administration, Austria. Before joining E&I, Philipp was a visiting researcher at the Farrell Center for Corporate Innovation and Entrepreneurship, Pennsylvania State University. Philipp’s broad research interest is new forms of innovation such as Collaborative Innovation and Innovation Networks. His current research explores how technological architectures emerge in complex innovation projects. He is particularly interested in the role of technological controversies and how these get resolved as different groups in a project interact with each other. Congratulations to these two scholars!
The Diversity of TMS Scholarship

— Nile Hatch

INFORMS publishes a subdivision guide to “provide potential and current INFORMS and subdivision members with an accurate, comprehensive summary of each section....” The newly revised entry for TMS emphasizes the multidisciplinary nature of research in technology. It states:

The Technology Management Section is a community for scholars and practitioners of technology management to discuss emerging ideas and promote novel research. TMS members come from diverse disciplinary backgrounds and employ diverse methods in their work to explore the boundaries of the field including topics such as innovation management, product development management, R&D management, engineering management, knowledge, learning, intellectual capital, entrepreneurship, technology diffusion, technology forecasting, technology and organizational change, technology strategy, and other topics.

The diverse disciplines of our section are reflected in the research presented in the annual INFORMS meetings. In the 2009 TMS program, we see most of these themes represented with five sessions on technology strategy; four sessions focusing on the relationships between technology, learning, and knowledge; three sessions on entrepreneurship; two sessions on innovation/new product development management; and one session each on technology diffusion, technology and organizational change, and technology forecasting.

This diversity of disciplines represented in TMS goes back many years. For example, over the past five years, the TMS program has seen over twenty sessions on knowledge and learning; over twenty sessions on innovation/product development management; almost twenty sessions in technology strategy; ten sessions on entrepreneurship; and a regular presence of sessions on engineering management, technology diffusion, technology forecasting, and the interface between technology and organizational change. We have also enjoyed the insights of diverse distinguished speakers including Eric von Hippel, Ashish Arora, Cheryl Gaimon, Carliss Baldwin, and, this year, Marvin Lieberman.

If you are interested in organizing a session or giving a presentation in the TMS program in 2010 in Austin Texas, please contact Nile Hatch (nile@byu.edu).

Managing Trends in TMS Finances and Membership

— David Moore

The Technology Management Section concluded 2008 holding $13,691 in retained earnings and serving 218 active members. TMS concluded 2002, the earliest year for which INFORMS provided data, holding $18,019 and serving 328 active members. The TMS nominal cash position declined by just over 24% and membership declined by nearly 34% during this seven-year period. The current article examines the underlying details and identifies steps TMS can take to manage these trends. (All dollar figures have been rounded to the nearest whole dollar.)

Financial Trends: The drop in cash position does not portend any near-term financial crisis. During the years 2002-2008, TMS lost an average of $618 per year (see figure 1). TMS may continue (losing money) at this rate for over 22 years, through the year 2030, before running out of cash. TMS is not for profit, and occasional operating losses may be tolerable or even valuable. However, the gain/loss profile plotted in figure 1 demonstrates that annual losses have become the norm. Historically, TMS spends money on awards, annual meetings, newsletter production and distribution, and occasionally a small amount on balloting. Profiles have been plotted for all major TMS expenditure categories in figure 1 (balloting expense excluded). TMS earns revenue in two forms, membership dues and interest on retained earnings. Both profiles have been plotted in figure 1.

Expenses: Average annual TMS expenditures during 2002-2008 equaled $3165. As figure 1 illustrates, from 2005 onward TMS awards and the national meeting accounted for nearly all

Figure 1: Major TMS cash flows, 2002 - 2008
expenditures. On average during 2002-2008, awards and the national meeting accounted for about 94% of annual TMS expenditures. During 2002-2003, producing and mailing the TMS newsletter accounted for 13-15% of annual expenditures. However, during 2004 the newsletter process transitioned to electronic distribution. With newsletter expenses eliminated, during 2005-2008 the cost of the national meeting and awards accounted for roughly 99% of annual TMS expenditures.

National meeting expense varies primarily with the number of TMS members expected to attend the business meeting. In recent years, as business meeting attendance has grown, TMS has ordered refreshments for 25-30 people. About 25 people attended during 2007, and about 30 people attended during 2008. This year we have planned for 30 people to attend. During 2006, the only year in the sample during which TMS did not lose money, annual meeting expense per member was only 65% of the average during 2002-2008. As I recall, but have not been able to verify as of yet, we ordered refreshments for perhaps 15 people during 2006. During 2006 - 2008 an increasing number of members attended the annual business meeting, even as overall membership in TMS declined. This trend drove up the business meeting expense per member, and by the end of 2008 it had risen nearly 26% compared to 2004 levels.

The amount of cash given as part of each TMS award largely drives annual award expense. TMS award amounts have traditionally been linked to the cost of INFORMS registration, with the intent of helping to defray registration costs. INFORMS registration costs have increased over time, putting upward pressure on annual award expenses. During recent years the TMS best dissertation award winner received $350 and the runner-up received $250. The distinguished speaker received $500, and if not otherwise attending the conference, also received the cost of conference registration ($350). These comprise the (cash) awards granted annually and total $1450. The corresponding plaques cost about $350 including labor. The cost of plaques plus cash awards totals $1800, close to the average amount of $1781 that TMS spent annually in this category during 2002-2008. During 2009, TMS will also present the distinguished service award, a rare award last presented during 2004, which includes a plaque and a check for $500. The average annual award expense during 2002-2009 thus equals approximately $1861.

**Revenue:** Annual dues receipts increased during 2006, in part due to a net membership gain of 17 people realized during the year. The actual dues increase realized depended on how the mix of member types enrolled in TMS changed, as well as on how the total number of members changed. During 2006 regular members of INFORMS paid annual TMS dues of $10, student members paid $5, student “community-only” members paid $17.50, etcetera. The number of TMS members of each type at the end of the year determined the total annual dues received. This relationship holds true today.

In figure 2, the number of active TMS members at the close of each year has been scaled by a factor of ten and plotted as the curve MembersX10. Profiles of the annual dues revenue and national meeting expense, both of which vary with the number of members, have also been plotted. (The scaling of membership numbers facilitates comparison with the dues revenue and national meeting expense).

Together the Dues and MembersX10 profiles indicate TMS received substantially lower average dues per member during 2002 than during subsequent years. Indeed, TMS received an average of $7.07 per member during 2002, and received an average of $8.22 - $8.87 per member during subsequent years. This occurred because TMS merged with the Productivity Management & Technology Section during 2002. Regular members of PMTS paid $5.00 per year and student members paid $2.50 per year during
2002, while TMS dues were higher. This explains the big difference in the slopes of the MembersX10 and Dues profiles during 2002-2003. Otherwise, the similarity of the slopes of these curves reveals that the average per-member dues received by TMS varied only slightly, within about 2% of the 2003 level, during 2003-2006. However, during 2007 and 2008 the membership mix changed more significantly, and by the end of 2008 average dues per member had dropped by about 5.5% compared to 2006 levels, and by 7.3% compared to 2003 levels.

Interest earned has varied with interest rates, and also with retained earnings. Retained earnings have fallen during recent years. TMS controls the trajectory of retained earnings by controlling the trajectory of annual gains/losses. Falling interest earnings exacerbate existing imbalances between annual dues income and expenses, just as rising interest earnings during 2004-2007 helped offset such imbalances.

Managing Financial Trends: TMS lost an average of $2.14 per member per year during 2002-2008. Excluding 2006, with its outlier cost components, TMS lost about $2.91 per member per year during 2002 - 2008. One possible response to this trend would be an increase in annual TMS dues. Student members of TMS who are also members of INFORMS pay half the regular TMS member dues, and as of 2008 comprise as much as 28% of TMS members. Thus, member dues may need to increase by 36% in order for TMS to break even during a typical year, ignoring inflation. If TMS decided to increase dues, the required increase would be estimated with greater precision.

If TMS somehow became more effective attracting and retaining members the gap between revenue and expenses would close. How many members does TMS need in order to break even, given the expenditure patterns observed in recent data? To answer this question I have estimated the annual gain realized by TMS utilizing the following formula: Net Annual Gain = (D - NM)M + I – A. The variable M represents the number of active TMS members, D the average dues per member (depends on member mix), NM the national meeting expense per member (depends on how many members attend the annual business meeting), I the annual interest earnings (depends on interest rates and retained earnings), and A the annual awards expense (depends on INFORMS registration fees). This formula does not account for inflation. For now we settle for a simplistic analysis based on average values. During 2002 – 2008, TMS earned an average of $8.36 per member in dues, $267 in interest, and spent an average of $4.65 per member at the national meeting (excluding 2006). The 2002-2009 average award expense ($1861) will be used in order to account for the occasional granting of the distinguished service award.

Solving for M we obtain 430 members. If we reduce the award expense by a third M must be at least 265, and if we reduce the award expense by one half M must be at least 179. If we reduce the average national meeting expense per member by a third M must be at least 304, and if we reduce it by one half M must be at least 264. Finally, if we reduce both the national meeting expense per member and the awards expenses by 20%, M must be at least 264 members. As of January 1st 2009, TMS had 218 active members. This number has increased during the year and should peak once the INFORMS annual meeting concludes.

An increase in dues may lead to reduced membership. Although it seems less likely, reductions in cash award levels and in refreshments provided at the annual business meeting may also lead to reduced membership. Taking steps to retain current members and attract new members more effectively before considering any dues increase would seem wise. Once steps to retain and attract members have been taken and membership levels stabilize, TMS may need to fine-tune cash awards and annual meeting refreshments. TMS may also want to seek and encourage community-only memberships in order to increase average dues per member.

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<th>2003</th>
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<tr>
<td>Student</td>
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<td>28%</td>
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<td>Regular</td>
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<td>70%</td>
<td>74%</td>
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<td>Retired</td>
<td>3%</td>
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Table 1: TMS mix of membership types.
Membership Trends: The 34% drop in membership during 2002-2008 seems precipitous. INFORMS membership remained relatively flat and varied within 3% of 2002 levels during this same timeframe. A merger with the Productivity Management & Technology Section during 2002 may explain some of this decline in membership. Following the merger, some members may have discovered the resulting TMS organization misaligned with their needs. Year-over-year membership fell 8.8% during 2002-03 and 8.4% during 2003-04. During 2004-05 the downward trend flattened out and membership fell only 2.6%. During 2005-06, membership increased by 5.2% compared to 2005. However, during 2007 membership fell by 11.7% and during 2008 membership fell by 12%. The MembersX10 profile plotted in figure 2 shows this trend.

Andrew Nelson (University of Oregon) has taken steps towards helping us understand these trends in TMS membership. Andrew analyzed the demographics of TMS members using data TMS obtained from INFORMS (for a fee). The analysis of membership data and trends is a work in process. TMS may need to survey current and lapsed members before knowing why membership numbers have fallen. At the very least, deeper analysis of the data obtained from INFORMS will be needed and is ongoing. I share excerpts and some preliminary findings from Andrew’s analysis below, integrating these into the current analysis.

Mix of Membership Types: Andrew partitioned TMS members into lapsed, renewing and new members and examined the demographics of these groups during 2003 and 2008. He also examined the demographics of TMS as a whole during 2003 and 2008. As of December 31, 2008, 25% of TMS members were new members and had never been TMS members before. The remaining 75% of TMS members renewed memberships that expired prior to 2008. Table 1 shows the mix of student, regular and retired members in TMS during 2003 and 2008. The proportion of students is 2% higher, and the proportion of regular and retired members are each 1% lower during 2008 compared to 2003.

The change in the mix of TMS membership types from 2003 to 2008 should fully explain the 7.3% decline in average dues received per member during the same timeframe (noted in the Annual Revenue section of the current article). Table 1 does not show the percentage of community-only members versus the percentage of INFORMS members of each type (student, regular and retired). Community-only members pay higher TMS dues (but do not pay INFORMS dues). Most likely a decline in community-only memberships explains most of the 5.5% drop in average dues per member observed during 2006-2008.

Academic/Professional Affiliations: Tables 2 and 3 show approximate percentages of members with academic, professional, government and other (e.g. non-profit) affiliations. (Percentages are approximate because I “eyeballed” the numbers from Andrew’s graphs). Table 2 shows that during 2008 roughly a third of new TMS members had professional affiliations, while roughly a sixth of renewing TMS members had professional affiliations. However, in table 3...
we discover the mix of TMS member affiliations during 2008 was about the same as during 2003. In both the lapsed and the renewing populations, the average membership duration of professional members lasts shorter than that of academic members. Lapsed professionals had an average membership duration lasting 1.8 years versus 2.2 years for lapsed academics. Renewing professionals have an average membership duration lasting 5.4 years versus 5.5 years for renewing academics. The data only go back to 2002, so left-censoring impacts these statistics.

**Education:** Table 4 shows that a much greater proportion of renewing members held PhD’s than did either new or lapsed members during 2008. Eliminating students from the new population, the percentage of PhD’s (67%) becomes roughly equal to the percentage of PhD’s in the renewing population. This may indicate TMS has been losing members at the Master’s degree level. Even after isolating the affiliations within the professional and academic populations, to control for interaction effects between education and academic/professional affiliation, differences in education between lapsed and renewing populations remain. Only 66% of non-renewing academics hold a PhD, while 78% of renewing academics hold a PhD, and only 23% of non-renewing professionals hold a PhD, while 47% of renewing professionals hold a PhD degree. These data suggest TMS may hold increasing appeal for PhD degree holders and decreasing appeal for non-PhD degree holders.

**Other Association Memberships:** We only have data on other association memberships for 131 of 702 individuals. Therefore, the total number of other association memberships, and possibly the number of different organizations have been undercounted. TMS members have other association memberships with 22 different organizations. Comparing other association memberships during 2003 with those during 2008 reveals strong similarities. The top 6 other association memberships during 2003 included AOM (15%), POMS (14%), DSI (13%), IEEE (13%), and ACM and IIE in a tie for fifth place (7%). The top 6 other association memberships during 2008 included AOM (19%), DSI (17%), IEEE (13%), POMS (12%), ACM (6.5%) and IIE (6%). Percentages of TMS members provided in parentheses are approximate.

During 2008 the top 6 other association memberships in the renewing population included AOM (20%), DSI (16%), IEEE (13%), POMS (13%), IIE (8%), and ACM (6%). The top 6 other association memberships in the new population included DSI (22%), POMS (22%), IEEE (12%), AOM (9%), AIS (6.5%), and IIE (6%). The top 6 other association memberships in the lapsed population included AOM (11%), DSI (10%), POMS (10%), IEEE (9%), IIE (7%) and ACM (7%). Other association memberships in AOM are much more prevalent among renewals than among both the new and lapsed populations. Other association memberships in POMS and DSI are more prevalent among new members than among either renewing or lapsed members. However, the overall mix of association memberships during 2003 and 2008 was very similar. The data could signal shifting interests among newer members who have yet to impact TMS demographics, or newer members may adjust their portfolios of association memberships as they gain experience.

**International or Domestic:** International (non-U.S.) members comprised 35% of the new member population during 2008, while they comprised approximately 20% of both the lapsed and renewing populations. These numbers may suggest TMS holds increasing appeal for an audience residing outside U.S. borders. However, the international share of TMS membership increased only slightly from 2003 – 2008, rising from 24% to 26%. Continued high proportions of international members in the new member population should continue driving up the overall proportion of international TMS members.
members, provided TMS fulfills the needs and expectations of international members.

**Duration of Tenure:** Andrew Nelson created figure 3, which shows how many years new members remained in TMS before allowing their membership to lapse, but only for members who joined during 2003 or later. Dropping 2002 from the series eliminates the left-censoring problem for members who joined prior to 2002. A total of 215 people joined TMS and subsequently failed to renew during 2003 – 2008, and most of these people remained in TMS for one year.

**Managing Membership Trends:** TMS membership has been shifting towards PhD holders and has become more international. Members not holding PhD degrees tend to lapse. Members having professional affiliations tend to remain members for less time than members having academic affiliations. During 2008, new members were more likely than renewing members to have professional (versus academic) affiliations, to be members of DSI and POMS, and to have a non-U.S. address. During 2008, new members were less likely to be members of AOM than renewing or lapsed members. Out of 215 new members who joined TMS during 2003 or later, over 130 lapsed after the first year of membership, and the average tenure of membership lasted less than two years.

The TMS program focuses on PhD – level academic research as opposed to practice, so how will TMS succeed at retaining non-PhD degree holders and professionals? What can TMS do that will be consistent with our mission and will create more value for such members? TMS officers have discussed the possibility of adding conference sessions focused on technology management education, which may be of interest to master’s degree holders as well as to PhD degree holders who teach. TMS needs someone to take the lead and organize such sessions, and we need to make room for such sessions in the TMS program. What can be done to retain international members? One thing TMS can do is allocate presentation slots in the program to international scholars, and allow international scholars to take the lead organizing sessions.

Creating more room in the TMS program for relevant and high-quality competing interests may be one of the more productive steps TMS can take to increase member retention. However, if sessions of one type must be dropped in order to make room for sessions of a different type in the TMS program the process becomes a zero-sum game. It may help stabilize and restore TMS member numbers if TMS adds and fills a second room within the TMS program. During years when a second room is added to the TMS program, the TMS Vice Chair of Programs needs to coordinate with the New Product Development (NPD) cluster chair and the INFORMS conference contact person while assembling the program, in order to avoid impacting the NPD program in undesirable or unintentional ways.

**Conclusions:** TMS membership numbers have declined and TMS has lost money during recent years. TMS officers can wait for membership numbers to stabilize at lower levels. Then, TMS will need to reduce expenditures on awards and refreshments served during the annual business meeting, increase annual dues, or both. TMS officers can also take proactive steps to more effectively attract and retain members. Simplistic break-even analysis suggests TMS needs 250 - 300 members to break even at current dues levels, perhaps accompanied by minor reductions in expenses. TMS demographics suggest additional sessions in the TMS program focused on topics of interest to professionals, non-PhD’s, and international members may generate a positive response in membership numbers. However, TMS needs to remain consistent with its mission. New sessions focused on TMS education may be a good fit. TMS may need to add a second room to the TMS program. The additional capacity can be used to accommodate TMS education sessions and to ensure additional international scholars find space in the program. TMS currently holds enough retained earnings to take measured steps over a period of years that will bring membership levels and expenditures into balance, and to ensure such steps remain consistent with the TMS mission. It would be wise to act while this remains true.
Dear TMS colleagues,

Welcome to 2009 INFORMS Technology Management Section (TMS) sponsored cluster!

First of all, I would like to take this opportunity to thank the session chairs, the authors and TMS officers for their contributions in making this year’s conference a success. Let me also extend my sympathy to those who had to cancel their participations due to budget cuts.

We have planned four days of stimulating sessions for you. In addition to contributions from the U.S., we have presentations from all over the world including Brazil, Canada, Taiwan, Netherlands, Finland, Denmark, Spain, and more. May such diversity enrich our perspectives on Technology Management. I hope we can share interesting ideas and make new friendships. Exciting topics include flexible technology management; technology change management for sustainability; technology management under risk; NPD and knowledge management; technology and innovation; models in entrepreneurship; perspectives on technology development and diffusion; modularity in business models, processes and logistics; vehicle routing and uncertainty; modularity in services – efficiency, flexibility, and innovativeness; technology licensing and creativity; technology, QFD and logistics services; and design and brand management.

Keeping up with the tradition, we have two KLIC (Knowledge, Learning, Intellectual Capital) sessions. Thanks to Charles Weber and Nile Hatch for their extra efforts!

This year’s TMS distinguished speaker is Marvin Lieberman, who is going to share his expertise with us on “Perspectives on Technology and Market Entry: Themes from Business Strategy.” This is a shared session with the New Product Development (NPD) track, taking place on Monday, 16:30-18:00. Thanks to Francisco Veloso for putting this session together, and to the NPD cluster chairs: Sanjiv Erat and Thomas Roemer!

The 2009 INFORMS TMS Doctoral Dissertation Award goes to Brian Fifarek. Philipp Tuertsch is the runner up. Don’t miss their presentations on Monday, Technology and Innovation Session, 8:00-09:30. Thank you, Janice Carrillo!

We also have a student paper session, a great opportunity for the Ph.D. students to meet the seniors and experience the excitement of presenting a paper! Join us on Wednesday, 14:45-16:15. Thank you, Fred Phillips!

See you in San Diego,
Juliana

Sunday, October 11

SA : 08:00 - 09:30 Flexible Technology Management
Chair: Yingxia Yang,Massachusetts Institute of Technology, 550 Memorial Dr, Apt.11b3, Cambridge MA 02139, United States of America, yingxia@mit.edu

1. Characterizing the Value of Technology Choice under Demand Uncertainty
   Lead: Thomas Rand-Nash, PhD Student, MIT, 292 Main Street, e38-435, cambridge ma 02142, United States of America,trand@MIT.EDU Co-Author: Randolph Kirchain,Associate Professor, MIT, 77 Massachusetts Ave, E38-432, Cambridge MA 02139, United States of America, kirchain@mit.edu, Richard Roth,Director, Materials Systems Lab, MIT, 77 Massachusetts Ave, E38-435, Cambridge MA 02139, United States of America, rroth@mit.edu
   Abstract: Characterizing demand uncertainty over time may change the competitive position of new technologies. This work seeks to define how demand distribution characteristics impact the production volume at which multiple technologies reach revenue parity as a function of technological revenue structure. A case study is presented to model the value tradeoffs of two competing technologies used to produce the automotive body-in-white under demand uncertainty and over time.

2. Multiple Sources of Manufacturing Flexibility and Their Interactions under Demand Uncertainty
   Lead: Yingxia Yang, Massachusetts Institute of Technology, 550 Memorial Dr, Apt.11b3, Cambridge MA 02139, United States of America, yingxia@mit.edu, Co-Author: Randolph Kirchain, Associate Professor, MIT, 77 Massachusetts Ave, E38-432, Cambridge MA 02139, United States of America, kirchain@mit.edu, Richard Roth,
Director, Materials Systems Lab, MIT, 77 Massachusetts Ave, E38-435, Cambridge MA 02139, United States of America, rroth@mit.edu

**Abstract:** This research studies multiple sources of flexibility to respond to demand uncertainty for manufacturing systems through a simple and hypothetical case. The impact of considering multiple sources of flexibility on strategic planning decisions is demonstrated and the trade-offs and interactions between multiple sources of flexibility are studied.

3. **ETK Model: Effects on Higher Education Faculty Satisfaction**

Lead: **Josef Cardenas**, Doctoral Student, Alliant International University, 5315 Triana St., San Diego CA 92117, United States of America, jcardenas@alliant.edu

**Abstract:** This paper is a literature review and an analysis of a research study that implemented the ETK model. The ETK model and survey instrument recognizes and measures emotional human (E), technology (T), and knowledge (K) skills, abilities, and competencies that affect an organizations performance. The literature review condenses previous academic research and publications done on these skills, abilities, and competencies.

4. **Considering the Role of Labor Learning in the Value of Manufacturing Flexibility**

Lead: **Randolph Kirchain**, Associate Professor, MIT, 77 Massachusetts Ave, E38-432, Cambridge MA 02139, United States of America, kirchain@mit.edu; Co-Author: **Marie-Claude Nadeau**, MIT, 77 Massachusetts Ave, Cambridge MA 02199, United States of America, mcnadeau@alum.mit.edu; **Richard Roth**, Director, Materials Systems Lab, MIT, 77 Massachusetts Ave, E38-435, Cambridge MA 02139, United States of America, rroth@mit.edu

**Abstract:** Evaluation of manufacturing flexibility has largely assumed labor to be inherently flexible and irrelevant. However, learning effects lead to both costs and benefits associated with labor flexibility. Decision-tree models were applied to an automotive assembly case to illustrate the impact of labor learning on the value of flexibility. Results suggest that learning effects can notably increase this value. This effect grows with learning rate, demand volatility, and probability of demand growth.

SA : 08:00 - 09:30 Knowledge Transfer Across Product, Individual, and Organizational Boundaries

Chair: **Erica Fuchs**, Assistant Professor, Carnegie Mellon University, 5000 Forbes Avenue, Baker Hall 131E, Pittsburgh PA 15213, United States of America, erhf@andrew.cmu.edu

1. **Knowledge Transfer Across Individuals and Products in Offshore Manufacturing**

Lead: **Carolyne Denomme**, Carnegie Mellon University, 5000 Forbes Avenue, Baker Hall 131E, Pittsburgh PA 15213, United States of America, cdenomme@cmu.edu; Co-Author: **Linda Argote**, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh PA 15213, United States of America, argote@cmu.edu; **Dennis Epplie**, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh PA 15213, United States of America, epplie@andrew.cmu.edu; **Erica Fuchs**, Assistant Professor, Carnegie Mellon University, 5000 Forbes Avenue, Baker Hall 131E, Pittsburgh PA 15213, United States of America, erhf@andrew.cmu.edu

**Abstract:** This talk provides new insights into the significance of product mix and turnover rates on organizational learning. Analysis draws on three years of detailed production data on one facility’s 1,339 optoelectronic product variations and 7 years of human resource data of the same facility’s 11,742 employees.

2. **Generative Mechanisms of Inter-Firm Knowledge Access, Mobility, and Organizational Ties**

Lead: **Rafael Corredoira**, Assistant Professor, University of Maryland, Robert H. Smith School of Business, 4557 Van Munching Hall, College Park MD 20742, United States of America, rcorredoira@rhsmith.umd.edu

**Abstract:** This paper explores whether two generative mechanisms (enduring personal ties and attention-focusing routines) facilitate access to knowledge across firm boundaries that result in a form of innovation: technical solutions granted patents. It departs from extant literature on inter-organizational knowledge transfer by actually testing and providing evidence supporting both generative mechanisms underlying the knowledge access through inventor mobility phenomenon.

3. **Intellectual Human Capital and Strategic Alliances: Complements or Substitutes?**

Lead: **Kwanghui Lim**, Assistant Professor, k@kwanghui.com; Co-Author: **Pek-hooi Soh**, Assistant Professor, Simon Fraser University, Segal Graduate School of Business, 500 Granville Street, Vancouver BC V6C W6, Canada, pso28@sfu.ca; **Annapoornima Subramanian**, University of California Berkeley, Berkeley, Berkeley CA, United States of America, annapoornima@gmail.com

**Abstract:** We examine how firm and network-level factors shape innovation. At the firm level we categorize human capital into (1) pure scientists (2) bridging scientists and (3) pure inventors. At the network level, university alliances are distinct from inter-firm alliances. Using patent, publication and alliance data on 435 biotechnology firms, we show that pure and bridging scientists substitute university alliances, whereas bridging scientists and pure inventors complement firm alliances.

4. **Uncertainty, Learning, and the Termination of Bad Projects**

Lead: **Oliver Baumann**, University of Munich, Co-Author: **Dirk Martignoni**, University of St. Gallen,

**Abstract:** Organizations often fail to terminate bad projects. Traditionally, this phenomenon has been framed as a problem of escalation of commitment, suggesting that bad projects should be terminated sooner than later. We use a simulation model of organizational learning to explore the robustness of this argument. We show that under conditions of high uncertainty, it can actually become rational to pursue projects that have a low or even negative estimated value, if an organization does not want to prematurely abandon too many (potentially good) ideas. This result arises as the value of new ideas is often underestimated, and errors of underestimation may be hard to correct in experiential learning processes.

SB : 11:00 - 12:30 Knowledge, Learning, Intellectual Capital (KIL) - 1: The Dynamics of Learning

Chair: **Charles Weber**, Portland State University, P.O. Box 751 -- ETM, Portland OR 97207, United States of America, charles.weber@etm.pdx.edu

1. **Status in Open Innovation Contests**

Lead: **Cheryl Druel**, Assistant Professor, George Mason University, School of Management, MS 5F4, Fairfax VA 22030, United States of America, cdruehl@gmu.edu

**Abstract:** Firms such as InnoCentive act as intermediaries between companies with problems to solve (seekers) and individuals offering solutions (solvers). I incorporate status
as a motivation into a model of solver participation with the goal of understanding how to design contest environments.

2. **How Delays Complicate Organizational Learning**
   Lead: Hazhir Rahmandad, Assistant Professor, Virginia Tech, 7054 Haycock Road, Room 430, Falls Church VA 22043, United States of America, hazhir@vt.edu
   Abstract: From investing in product development to burning fossil fuels and spending time on education, delays between taking actions and observing the results are pervasive in individual, organizational, and social settings. In this talk, I summarize the major mechanisms through which these delays complicate learning and thus can lead to inefficient allocation of resources and decision-making biases.

3. **Knowledge Sharing in Communities: The role of “Community Munificence”**
   Lead: Zeynep Erden, Doctoral Candidate, ETH Zuerich, KPL G 13, Kreuzplatz 5, Zuerich ZH 8032, Switzerland, zerden@ethz.ch, Co-Author: Seonwoo Kim, ETH Zuerich, Kreuzplatz 5, Zuerich, Switzerland, seonwookim@ethz.ch, Georg von Krogh, Professor, ETH Zuerich, Kreuzplatz 5, Zuerich 8032, Switzerland, gvkrogh@ethz.ch
   Abstract: Understanding why people intend to share or avoid sharing knowledge in a community is crucial for the community performance and outcomes. Yet, the role of “community” in explaining why people intend to share knowledge has not been studied in organizational knowledge creation literature. The goal of this paper is to fill the gap in the literature by looking at what community provides to the members that shapes the intentions to share knowledge.

4. **Radical Organizational Learning, Circadian Rhythms and the Broad Structure**
   Lead: Charles Weber, Associate Professor, Portland State University, Engineering and Technology Management, PO Box 751, Portland OR 97201, United States of America, webercm@gmail.com
   Abstract: The theory of punctuated equilibrium associates radical change with the disruption of an organization’s deep structure. An empirical study of semiconductor photomask manufacturing suggests that radical improvement in organizational performance is contingent upon synchronizing circadian rhythms across a stable broad structure of organizations within and outside the firm.

**SB : 11:00 - 12:30 Technology Change Management for Sustainability**
Chair: Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, afhs1@uaa.alaska.edu

1. **Replacement Analysis of Small Off-Grid Nuclear Reactors**
   Lead: Lei Yao, University of Alaska Anchorage, 3901 Old Seward Highway, Anchorage AK 99503, United States of America, asly4@uaa.alaska.edu, Co-Author: LuAnn Piccard, Instructor, University of Alaska Anchorage, ESPM 3211 Providence Dr., Anchorage AK 99508, United States of America, afhp@uaa.alaska.edu, Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, afhs1@uaa.alaska.edu
   Abstract: This research will focus on replacement analysis of ageing diesel generator systems in rural off-grid Alaskan communities. Marginal cost and annual equivalence analysis will be used to establish multiple-objective decision making process selection criteria to minimize life cycle cost, environmental impact, and disposal risk for small nuclear power generation systems.

2. **Patent Mapping for Forecasting the Technology Change of Light Emitted Diode (LED) Streetlights**
   Lead: LuAnn Piccard, Instructor, University of Alaska Anchorage, ESPM 3211 Providence Dr., Anchorage AK 99508, United States of America, afhp@uaa.alaska.edu, Co-Author: Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, afhs1@uaa.alaska.edu, Lei Yao, University of Alaska Anchorage, 3901 Old Seward Highway, Anchorage AK 99503, United States of America, asly4@uaa.alaska.edu
   Abstract: LED lamps are costly but energy efficient lighting systems. This research focuses on the application of the white LEDs used in streetlight applications, and investigates the morphology of LED patentsincluding diode, bulb, structure, heat, fixture, and intelligent systems. The results demonstrate how local technology applications can foster global cooperation.

3. **Optimization Analysis of Warranty for the Technology Change of LED Streetlights**
   Lead: Oleg Bukhtiyarov, University of Alaska Anchorage, 727 Elm Street, 674, Anchorage AK 99501, United States of America, linousa@mail.ru, Co-Author: LuAnn Piccard, Instructor, University of Alaska Anchorage, ESPM 3211 Providence Dr., Anchorage AK 99508, United States of America, afhp@uaa.alaska.edu, Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, afhs1@uaa.alaska.edu
   Abstract: LED streetlights may economically replace the traditional streetlights. The fast change of the streetlight technology causes the difficulty of determination of the warranty period. Forecasting based on stochastic iterations/infinitive modeling with dynamic change of product quality provides a warranty strategy for the market that maximizes their profit over time.

4. **Optimal Analysis of a Hybrid Solar-Wind Power Generation System with LPSP Technology for LED Lighting**
   Lead: Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, afhs1@uaa.alaska.edu, Co-Author: He Liu, University of Alaska, 3211 Providence Dr., Anchorage, United States of America, afhli@uaa.alaska.edu, LuAnn Piccard, Instructor, University of Alaska Anchorage, ESPM 3211 Providence Dr., Anchorage AK 99508, United States of America, afhp@uaa.alaska.edu
   Abstract: This research explores a self-contained system using the renewable energy sources such as wind and solar and an energy saving load. Proposed is an algorithm to optimize the design of hybrid solar-wind power generation systems with Loss of Power Supply Probability (LPSP) technology for Light-Emitting Diode (LED) lights.

**SC : 13:30 - 15:00 Technology Management under Risk**
Chair: Leonardo Santiago, Federal University of Minas Gerais, Production Engineering Department, Av. Antonio Carlos, 6627 - Pampulha, Belo Horizonte MG, Brazil, lsantiago@ufmg.br

1. **The Impact of Risk Management in Project Performance**
   Lead: Marly Monteiro Carvalho, Associate Professor, University of São Paulo, Av Prof. Almeida Prado, trav 2, 128, São Paulo 05058-900, Brazil, marlymc@usp.br, Co-Author: Roque Rabechini Jr, Assistant Professor,
Learning in Online Communities. The Case of Rooster Teeth

Lead: Stefan Haefliger, Researcher, ETH Zurich, Kreuzplatz 5, Zurich 8032, Switzerland, shaefliger@ethz.ch, Co-Author: Peter Jaeger, Research associate, ETH Zurich, Kreuzplatz 5, Zurich 8032, Switzerland, pejaeger@ethz.ch, Georg von Krogh, Professor, ETH Zuerich, Kreuzplatz 5, Zuerich 8032, Switzerland, gvkrogh@ethz.ch

Abstract: Communities of users or consumers generate insights about products that may help other users or inspire manufacturers to learn about trends in the market and innovate. Little is known about the value creation in communities of consumption. We analyze a large online customer community of a Machinima production company that produces animated shorts in computer games. A significant amount of users provided comments with specialized feedback that eventually lead to innovation.

Qualitative Approach for Economic Evaluation of Technological Project Risks

Lead: Jose Luis Ribeiro, Dr., UFRGS, Av. Osvaldo Aranha 99, 5o Andar, Porto Alegre, Brazil, ribeiro@producao.ufrgs.br, Co-Author: Rogerio Miorando, Msc., UFRGS, Av. Osvaldo Aranha 99, 5o Andar, Porto Alegre 90035-190, Brazil, miorando@gmail.com

Abstract: This paper presents a qualitative approach for risk assessment of technological projects. The approach uses matrices to identify potential risks and probabilities. The main contribution of the proposed approach is the procedure used to quantify potential profits associated to technological projects under evaluation. The approach converts the different aspects of technological projects to financial units, allowing a complete an innovative analysis of the alternatives involved.

A Qualitative Approach for Economic Evaluation of Technological Project Risks

Lead: Jose Luis Ribeiro, Dr., UFRGS, Av. Osvaldo Aranha 99, 5o Andar, Porto Alegre, Brazil, ribeiro@producao.ufrgs.br, Co-Author: Rogerio Miorando, Msc., UFRGS, Av. Osvaldo Aranha 99, 5o Andar, Porto Alegre 90035-190, Brazil, miorando@gmail.com

Abstract: This paper presents a qualitative approach for risk assessment of technological projects. The approach uses matrices to identify potential risks and probabilities. The main contribution of the proposed approach is the procedure used to quantify potential profits associated to technological projects under evaluation. The approach converts the different aspects of technological projects to financial units, allowing a complete an innovative analysis of the alternatives involved.

On the Time Uncertainty of New Product Development Projects

Lead: Thiago Augusto Oliveira Silva, Graduate Student, Federal University of Minas Gerais, Belo Horizonte, Brazil, thiagoaooa@ufmg.br, Co-Author: Leonardo Santiago, Federal University of Minas Gerais, Production Engineering Department, Av. Antonio Carlos, 6627 - Pampulha, Belo Horizonte MG, Brazil, lsantiago@ufmg.br

Abstract: In this paper we compare two different approaches to the problem of capturing the impact of time uncertainty in the payoff of technology projects. The first considers the project payoff vis-à-vis the notion of a window of opportunity, while the second one tackles project payoff as a function of a commodity’s price. Implications of these two approaches are discussed.

16:30 - 18:00, NPD and Knowledge Management

Chair: Gulru Ozkan, Assistant Professor, Clemson University, Department of Management, 117B Sirrine Hall, Clemson SC 29631, United States of America, gulruo@clemson.edu

Product Platform Strategies Implications for Supply Chain Integration

Lead: Juliana Hsuan, Associate Professor, Copenhagen Business School, Dept. of Operations Management, Solbjerg Plads 3, Frederiksberg DK 2000, Denmark, js.omi@CBS.dk

Abstract: A conceptual framework called Platform Product Matrix (PPM) is introduced to assess product platform strategies (i.e. product architecture modularity) with respect to supply chain integration (i.e. the application of inter-organizational systems, supplier involvement, and product customization). PPM provides insights into how product variants would influence supply chain design and resource allocation.

Fusion Diffusion Confusion

Lead: Yuwen Chen, Assistant Professor of Supply Chain Management, University of Rhode Island, 7 Lippitt Road, Kingston RI 02881, United States of America, yuwen@mail.uri.edu, Co-Author: Janice Carrillo, Associate Professor, University of Florida, P.O. Box 1171769, Gainesville FL 32611-7169, United States of America, janice.carrillo@cba.ufl.edu

Abstract: As multifunction products (also referred to as fusion products) gain popularity, we observe that single-function products gradually disappear from the market as they are supplanted by fusion products. This paper presents a product diffusion model that captures the transition from two distinct single-function products into one fusion product. We investigate the optimal launch time of the fusion product and conduct a numerical analysis to demonstrate the dynamics among the three products.

Managing New Product Development Knowledge Between Competing Firms

Lead: Gulru Ozkan, Clemson University, United States of America, GULRUDO@exchange.clemson.edu, Co-Author: Cheryl Gaimon, Professor, Georgia Institute of Technology, 800 W. Peachtree St. NW, Atlanta GA 30308-0520, United States of America, Cheryl.Gaimon@mgt.gatech.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.

Workforce Knowledge Management and the Implementation of New Technology

Lead: Cheryl Gaimon, Professor, Georgia Institute of Technology, 800 W. Peachtree St. NW, Atlanta GA 30308-0520, United States of America, Cheryl.Gaimon@mgt.gatech.edu, Co-Author: Karen Napoleon, University of Georgia, United States of America, knapo@terry.uga.edu, Gulru Ozkan, Clemson University, United States of America, GULRUDO@exchange.clemson.edu

Abstract: We consider a firm’s dynamic resource capabilities and demonstrate importance of managing workforce knowledge for a technology upgrade. We examine how workforce knowledge changes over time due to upgrade and independent from it. We capture knowledge depreciation, learning-before-doing, forgetting; showing dramatically different KM strategies are needed before/after an upgrade.
Monday, October 12

MA : 08:00 - 09:30  Technology and Innovation
Chair: Janice Carrillo, Associate Professor, University of Florida, P.O. Box 1171769, Gainesville FL 32611-7169, United States of America, jancarillo@cba.ufl.edu

1. The Market Value of Supply Chain Flexibility: Theory and Evidence From the Clean Energy Industry
   Lead: Nitin Joglekar, Boston University, School of Management, Boston, United States of America, joglekar@bu.edu. Co-Author: Jane Davies, Boston University, School of Management, Boston, United States of America, jdavies@bu.edu
   Abstract: Nexus of competition is said to be shifting from individual firms to supply chains. We study flexibility, integration, assets and technology constructs that are reflected in the stock market valuation and then calculate associated supply chain effects. We offer and test hypotheses on the synergy between these constructs in the context of 42 solar photovoltaic supply chains. Results indicate that integration and assets are significantly associated with the valuation of the supply chain.

2. Globalization, Offshoring, and the Location of Innovation: A Case Study of Rare Earth Technology
   Lead: Brian Fifarek, Engineering Supervisor, Eaton Corporation, 4201 N 27th St., Milwaukee WI 53216, United States of America, BrianFifarek@Eaton.com
   Abstract: We analyze the impact of the movement of rare earth materials production from US to China on US rare earth innovation activities. We show that this movement causes some innovation activities to move away while others remain. We suggest that this relocation of innovation is conditioned by the nature of innovation processes and the role of knowledge spillovers among value chain actors. Using patents and industry observations, we use regression and modeling techniques to test this relationship.

3. The Emergence of Architecture in Modular Systems: Coordination Across Boundaries at ATLAS, CERN
   Lead: Philipp Tuertscher, Assistant Professor, WU Vienna University of Economics and Business, Entrepreneurship and Innovation, Nordbergstrasse 15, Vienna 1090, Austria, Philipp.Tuertscher@wu-wien.ac.at. Co-Author: Raghu Garud, Professor and Research Director, Pennsylvania State University, 430 Business Building, University Park PA 16802, United States of America, rgarud@psu.edu. Markus Nordberg, ATLAS Resource Coordinator, CERN, CERN, Geneva 23, Geneva 1211, Switzerland, markus.nordberg@cern.ch
   Abstract: Our study of the development of a complex technological system suggests that the emergence of technological architecture is characterized by an ongoing process of negotiations across diverse actors who have to justify and explain their design rationales. Such a process results in what we call interlaced knowledge, making it possible for actors to generate a deeper systemic understanding of the various components, anticipate latent interdependencies and coordinate even as the design emerges.

4. Explaining Structural Ambidexterity in High Technology Organizations: A Multilevel Perspective
   Lead: Aravind Chandrasekaran, The Ohio State University, Management Sciences Department, Fisher College of Business, Columbus OH 43210, United States of America, chandrasekaran.24@osu.edu. Co-Author: Kevin Linderman, University of Minnesota, 321 19th Avenue South, Suite 150, Minneapolis MN 55455, United States of America, linde037@umn.edu. Roger Schroeder, University of Minnesota, 321 19th Avenue South, Suite 150, Minneapolis MN 55455, United States of America, rschroed@umn.edu
   Abstract: Prior studies have emphasized the importance of structural ambidexterity. Yet, our understanding about this capability is still limited. This research delineates structural ambidexterity into two different contexts: macro and micro organizational contexts. Using multilevel data collected from 34 high technology divisions and 110 innovation and improvement projects, we examine the effects of both these contexts on project performance. Theoretical and practical implications are discussed.

MB : 11:00 - 12:30 Models in Entrepreneurship
Chair: Moren Lévesque, Associate Professor, York University, Schulich School of Business, Toronto ON M3J 1P3, Canada, mlevesque@schulich.yorku.ca

1. Resource Allocation Decision for the Internationalization of New Business Enterprise
   Lead: Adeoye Adegborite, Graduate Student, University of Waterloo, Waterloo ON, Canada, aadegborite@gmail.uwaterloo.ca
   Abstract: Many new business enterprises fail in the process of internationalizing. This is due, in part, to the challenges of allocating limited resources to sustain their local and international operations during and after internationalization. We formulate a decision model of resource allocation for the firm's local and foreign market activities. We characterize the resource allocation strategy that maximizes the firm's likelihood of survival during its internationalization process.

2. Entrepreneurship and Regional Concentration
   Lead: Graciela Kuechle, Lecturer, Witten/Herdecke University, Alfred-Herrhausen-Str.50, Witten 58448, Germany, Graciela.Kuechle@uni-wh.de
   Abstract: This paper presents an evolutionary game theoretic model to show why regions may differ in terms of their levels of entrepreneurial activity even when they have similar economic potential, decisions are made simultaneously, there is migration between regions, and individuals are predisposed to imitate economically more successful agents. This model can give rise to a permanent different rate of entrepreneurship even when there is a considerable exchange among regions.

3. Optimal Leader-Follower Strategies for Launching New Technologically-Advanced Products
   Lead: John Angelis, Rochester Institute of Technology, E Philip Saunders College of Business, 105 Lomb Memorial Drive, Rochester NY 14623, United States of America, jangelis@saunders.rit.edu
   Abstract: When launching a new, technologically-advanced product, a firm sets price and quality to maximize profits by attracting customers. However, its optimal decisions also depend on the level of innovation in customer segments and whether it is the first mover. We analyze a closed-loop Stackelberg game with perfect information. A firm will not necessarily earn more by being the first mover, and a firm with relatively high costs should target less innovative customer segments.

4. Do IPOs Balance Innovation against Growth?
MC: 13:30 - 15:00 Perspectives on Technology Development and Diffusion

Chair: Andrew Nelson, Asst Prof of Management, University of Oregon, Lundquist College of Business, Eugene OR 97405, United States of America, ajnelson@uoregon.edu

1. Antagonism, Aesthetics and Mimesis: The Institutional Failures of Aerodynamic Bicycle Technology
   Lead: Ralph Maurer, Visiting Asst Professor, Freeman College of Business, Tulane University, 1817 Homer Street, Metairie LS 70005, United States of America, rmaurer@mac.com
   Abstract: This paper examines a failure of institutional entrepreneurship from the field of professional bicycle racing. I chart the introduction of new aerodynamic bicycle technologies over the last thirty years and the subsequent stiffling by the international governing body for professional cycling, the Union Cycliste Internationale. Analysis reveals three social mechanisms that potentiate the failure of innovators to reshape institutions in their favor.

2. Cognitive Flexibility: The Adaptive Reality of Concrete Organization Change
   Lead: Nathan Furr, Assistant Professor, Brigham Young University, 660 TNRB, Provo UT 84604, United States of America, nfurr@byu.edu
   Abstract: The question of why some organizations change when others do not is of central interest. Recent case-based literature suggests cognitively flexible organizations are more likely to change. This study investigates the impact of three core constructs that contribute to cognitive flexibility—variety, novelty and framing—on when organizations change their technology. I examine these three constructs at the team and organization level on the likelihood of three degrees of technical change.

3. Knowledge Diffusion, Technology Transfer, and the Challenge of Assessment
   Lead: Andrew Nelson, Asst Prof of Management, University of Oregon, Lundquist College of Business, Eugene OR 97405, United States of America, ajnelson@uoregon.edu
   Abstract: While "knowledge diffusion" is a popular topic, its study has been shaped by the conflation of "knowledge diffusion" with "technology transfer," particularly as the latter is concerned with engineering and science. In this paper, I present data showing that dominant operationalizations of diffusion through the limited lens of technology transfer obscure important diffusion channels, processes and influences, while altering perceptions of active individuals and organizational reach/impact.

4. Breaking the Ivory Tower: Academic Entrepreneurship in the Life Sciences in UK and Germany
   Lead: Jeannette Colyvas, Asst Professor, Human Development and Social Policy, Northwestern University, colyvas@sesp.northwestern.edu, Co-Author: Carolin Haessler, Co-Author: Andrew Nelson
   Abstract: We examine engagement in commercial activities and different forms of technology transfer (consulting, patenting, and founding) among more than 2,200 German and UK life scientists. We test hypotheses that include attributes of individuals, their material and social resources, and perceptions about values and reputation. We find that characteristics reflecting the existing social structure of science are strong predictors for a greater breadth of participation in academic entrepreneurship, but not for all forms of technology transfer. Our findings also suggest that while, in practice, science and commerce go hand in hand, normative orientation still holds strong in shaping entrepreneurial involvement.

MD: 16:30 - 18:00 Joint Session Tech Mgt/INDP: TMS Distinguished Speaker: Marvin Lieberman

Chair: Francisco Veloso, fveloso@cmu.edu

1. Perspectives on Technology and Market Entry: Themes from Business Strategy
   Lead: Marvin Lieberman, Professor of Policy, UCLA, Anderson School of Management, Los Angeles CA, United States of America, marvin.lieberman@anderson.ucla.edu
   Abstract: A critical issue associated to all new technologies is the decision to enter the market. TMS Distinguished Speaker Marvin Lieberman will present an integrated perspective on the relationship between technology and market entry, combining topics such as first-mover advantage, imitation processes, disruption, industry life cycle, and implications of the learning curve.

Tuesday, October 13

TA: 08:00 - 09:30 Modularity in Business Models, Processes and Logistics

Chair: Anu Bask, Senior Advisor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, anu.bask@hse.fi

1. Modular Business Models in Logistics
   Lead: Mervi Rajahonka, Researcher, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, mervi.rajahonka@hse.fi, Co-Author: Anu Bask, Senior Advisor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, anu.bask@hse.fi, Markku Tinnila, Professor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, markku.tinnila@hse.fi
   Abstract: This paper looks at business models based on modular service structures at logistics service providers. Business models have become a tool for developing services with novel earning models, service channels and service processes. We believe that modularity in business models can solve many of the development challenges and offer service flexibility. The findings show that modularity approach provides a background for development of service offerings, business models and processes.

2. Intellectual Capital or Intellectual Property: What is More Important for Regional Economic Development?
   Lead: Nitin Mayande, Portland State University, Co-Author: Charles Weber, Portland State University, P.O. Box 751 – ETM, Portland OR 97207, United States of America, charles.weber@etm.pdx.edu
Abstract: A comprehensive analysis of US patent data from 1995 to 2005 suggests that wealth (as measured by GDP per capita) of (US) states increasingly depends upon the density of intellectual property rather than the density of intellectual capital. Attracting corporate headquarters to a region contributes significantly to regional prosperity. The study identifies clear winners and losers among US states.

3. Modular Business Processes in Financial Services
Lead: Thomas Frandsen, Ph.d. fellow, Copenhagen Business School, Solbjerg Plads 3 B5.19, 2000 Frederiksberg, Denmark, tfr.om@cbis.dk

Abstract: The principles of modularity have become increasingly important for the design of flexible business process architectures. A central question is how modular processes are developed and used to realize the benefits of flexibility. This paper investigates the development and reuse of standardized process components within the context of a financial service provider. Of particular interest are the consequences of modular process architecture on transaction characteristics and firm capabilities.

4. Modular Service Structures: Case E-business Logistics
Lead: Mervi Lipponen, Researcher, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, mervi.lipponen@hse.fi, Co-Author: Anu Bask, Senior Advisor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, anu.bask@hse.fi, Markku Tinnila, Professor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, markku.tinnila@hse.fi

Abstract: In the past years, continuous progress in e-commerce has taken place. Logistics has proved to be an important factor in implementing e-commerce. Consequently, this paper discusses the effects of the Internet sales channel on the physical delivery of goods and brings up features in logistics structures that are specific to e-commerce. Our special interest is on changes in service structures and logistics business models as well as opportunities of modularity and related technological solutions.

TB : 11:00 - 12:30 Vehicle Routing and Uncertainty
Chair: Tom Van Woensel, Eindhoven University of Technology, School of Industrial Engineering, PO Box 513, Pav F5, Eindhoven, Netherlands, t.v.woensel@tue.nl

1. Multi-Objective Time-Dependent Capacitated Vehicle Routing Problem with Time Windows
Lead: Said Dabia, Eindhoven University of Technology, PostBus 513, Eindhoven, Netherlands, s.dabia@tue.nl

Abstract: A limited fleet of vehicles serve a set of geographically scattered customers. Every vehicle has a finite capacity and limited time availability, and is allowed to make several tours during its operating period. Travel times are time-dependent and all customers need to get delivered in their specific time windows. We aim to minimize the total time travelled including any waiting times, while the total quantity delivered is maximized. Efficient dynamic programming algorithms are developed.

2. Dynamic Routing Using Real-time ITS Information
Lead: Ali R. Gum, Research Assistant, Wayne State University, 4815 Fourth St., Detroit MI 48202, United States of America, arguner@wayne.edu, Co-Author: Ratna Babu Chinnam, Associate Professor, Wayne State University, 4815 Fourth St., Detroit MI 48202, United States of America, r.chinnam@wayne.edu, Alper Murat, Assistant Professor, PhD, Wayne State University, 4815 Fourth St., Detroit MI 48202, United States of America, amurat@wayne.edu

Abstract: Growing travel time delays and variability in transportation networks are negatively impacting the efficiency of JIT logistics. Recurrent congestion is one of the primary reasons for delivery delay and variability. We model the problem as a time dependent TSP and propose a stochastic DP formulation for dynamic routing of a vehicle in non-stationary stochastic networks subject to recurrent congestion. Results are tested in a network of Southeast-Michigan using historical ITS data.

3. Consistent Vehicle Routing with Stochastic Customers: A Stochastic Programming Formulation
Lead: Ola Jabali, PhD Student, Technische Universiteit Eindhoven, Den Dolech 2 Pav. E.17, P.O.Box 513, Eindhoven 5600 MB, Netherlands, o.jabali@tue.nl, Co-Author: Ton de Kok, Full Professor, Technology University of Eindhoven, Department of Technology Management, P.O.Box 513, Eindhoven 5600MB, Netherlands, a.q.d.kok@tue.nl, Michel Gendreau, Professor, CIRRELT/Université de Montréal, C.P. 6128, succ. Centre-ville, Montréal QC H3C 3J7, Canada, michel.gendreau@cirrelt.ca, Tom Van Woensel, Eindhoven University of Technology, School of Industrial Engineering, PO Box 513, Pav F5, Eindhoven, Netherlands, t.v.woensel@tue.nl, Rei Walter, Université du Quóbec à Montréal, Cas postale 8888, succursale Centre-ville, Montréal H3C 3P8, Canada, Walter.Rei@cirrelt.ca

Abstract: We consider the consistent vehicle routing problem, in which customers are stochastic with respect to their occurrence. For these customers we want to provide consistent service, this is insured by having the same driver visit a customer when it requests service. Furthermore, for each customer we set a target arrival time. Realized deviations from the targets are penalized. We propose a stochastic programming approach, where the sequence and the targets are set in an a priori manner.

4. Reliability in Vehicle Routing with Time Windows
Lead: Tom Van Woensel, Eindhoven University of Technology, School of Industrial Engineering, PO Box 513, Pav F5, Eindhoven, Netherlands, t.v.woensel@tue.nl, Co-Author: Nico Dellaert, Technische Universiteit Eindhoven, P.O. Box 513, Eindhoven, Netherlands, n.p.dellaert@tue.nl, Duygu Tas, Eindhoven University of Technology, Den Dolech 2, Eindhoven, Netherlands, d.tas@tue.nl

Abstract: A vehicle routing problem is considered where reliability is considered important. Delivery reliability becomes more and more an order qualifier which is reflected by the customer's time windows. We consider stochastic travel time distributions, analyze the propagation through the network and the interplay with the customer's time windows. The value to the reliability of using these distributions in VRPTW is discussed and demonstrated on a number of instances.

TC : 13:30 - 15:00 KLIC II
Chair: Nile Hatch, Brigham Young University, Marriott School, 690 TNRB, Provo UT 84602, United States of America, nile@byu.edu

1. The Persistence of Organizational Knowledge across Merger and Acquisition Events
Lead: Peter Madsen, Assistant Professor, Brigham Young University, 585 TNRB, Provo UT 84602, United States of America, petermadsen@byu.edu
Abstract: The ability to gain access to new organizational knowledge is a frequently noted justification for corporate mergers and acquisitions. However, there is good reason to expect that much organizational knowledge may be lost during merger and acquisition events. In this paper, I examine the persistence of previously acquired organizational knowledge across mergers and acquisitions in the U.S. airline industry.

2. The Pharma/Biotech Innovation Conundrum: R & D Spending Up, No. of Drugs Down
Lead: Tom Hill, Principal, The Leverage Innovation Group, 1677 Honfleur Drive, Sunnyvale CA 94087, United States of America, thill@leverageinnovation.com
Abstract: This paper identifies the challenge facing the healthcare industry in terms of research and development productivity. While the industry has doubled spending in R&D in the past 9 years, the number of drugs actually approved has dropped in half. The paper identifies strategic issues that contribute to this lack of productivity, and the role that innovation pathways play toward a solution.

3. Social Network Ties, Transactive Memory, and Performance in Groups
Lead: Kyle Lewis, Associate Professor, University of Texas at Austin, 1 University Station, Austin TX 78712, United States of America, kyle.lewis@mccombs.utexas.edu, Co-Author: Daniel Bachrach, University of Alabama, Tuscaloosa AL 35487, United States of America, dbachrac@cba.ua.edu, Jeong-Yeon Lee, University of Kansas, Lawrence KS 66045, United States of America, jaylee@ku.edu
Abstract: We use transactive memory systems (TMS) theory to explain what drives the effects of certain social network structures in small groups. We examine the combined effects of reciprocity and the number of ‘axis’ members and TMS on team performance. We find that different network structures differentially affect TMSs and performance. The implications of the results from this experiment for theory, as well as practice are developed.

4. Information Velocity and Competitive Advantage
Lead: Nile Hatch, Brigham Young University, Marriott School, 690 TNRB, Provo UT 84602, United States of America, nile@byu.edu, Co-Author: Alex Cavallini, Kenco Logistics, Fort Worth TX 76140, United States of America, alacavallini@gmail.com, Michael Miles, Brigham Young University, Provo UT 84602, United States of America, mmiles@byu.edu, Ryan Williams, Brigham Young University, Provo UT 84602, United States of America, ryan.williams@byu.edu
Abstract: Information velocity is the ability to respond correctly to uncertain market demand. Manufacturers that transform information into offerings faster than rivals earn competitive advantages through lower costs, growing revenues, and price premia. We find that lean manufacturers have greater information velocity and enjoy 2.5 times greater returns than non-lean firms with lower information velocity. This result is strengthened in markets with high demand volatility.

TD : 16:30 - 18:00 Modularity in Services: Efficiency, Flexibility, and Innovativeness
Chair: Saara Pekkarinen, Project Leader, University of Oulu, P.O.Box 4600, Oulu 90014, Finland, saara.pekkarinen@oulu.fi
1. Modular Service Innovation: Managing Customer Knowledge in Creating Business Services

Lead: Minna Rollins, University of West Georgia, Richards College of Business, 1600 Maple St., Carrollton, GA, Carrollton, United States of America, mrollins@westga.edu, Co-Author: Saara Pekkarinen, Project Leader, University of Oulu, P.O.Box 4600, Oulu 90014, Finland, saara.pekkarinen@oulu.fi
Abstract: This paper discusses the role and importance of customer knowledge in creating modular business services. Authors conceptualize how service firms can utilize their customer knowledge and manage customer interface in creating modular business services. This research integrates literature on modularity and service innovation from services marketing, service operation management, and knowledge management. In addition, authors discuss managerial implications for service firms.

2. ****LATE CANCELLATION****Key Modularity Dimensions of Service Innovations
Lead: Saara Pekkarinen, Project Leader, University of Oulu, P.O.Box 4600, Oulu 90014, Finland, saara.pekkarinen@oulu.fi, Co-Author: Jari Juga, University of Oulu, Faculty of Economics and Business Administration, P.O.Box 4600, Oulu, Finland, jari.juga@oulu.fi, Jouni Juntunen, University of Oulu, Faculty of Economics and Business Administration, P.O.Box 4600, Oulu, Finland, jouni.j.juntunen@oulu.fi
Abstract: Paper explores modularity in creating logistic services and the patterns of organizational adjustments that might be required. Modularity dimensions 1) collaboration and coordination of functions, 2) integration and coordination of resources, and 3) interaction and communication are examined. This research builds on economics and management literature on modularity. Field data simulation and interviews result in theoretical and managerial implications.

3. The Effect of Standardization and Agility on Logistics Costs
Lead: Vesa Autere, National Defense University, Department of Leadership and Military Pedagogy, Santahamina, Helsinki, Finland, vesa.autere@mil.fi, Co-Author: Jouni Juntunen, University of Oulu, Faculty of Economics and Business Administration, P.O.Box 4600, Oulu, Finland, jouni.j.juntunen@oulu.fi, Mari Juntunen, University of Oulu, Department of Marketing, P.O.Box 4600, Oulu, Finland, mari.j.juntunen@oulu.fi
Abstract: This paper examines how standardization and agility affect the logistics costs of logistics service purchasers. A conceptual model is developed and tested with structural equation modeling (SEM) using empirical data from the Finnish Defense Forces, public sector and industrial companies. The results show that standardization promotes agility and agility advances cost reductions. Thus, standardization and agility are essential elements when the organization structure is modular.

4. Soft and Hard Commitments: Two Supplement Methods to External Economies
Lead: Jouni Juntunen, University of Oulu, Faculty of Economics and Business Administration, P.O.Box 4600, Oulu, Finland, jouni.j.juntunen@oulu.fi, Co-Author: Mari Juntunen, University of Oulu, Department of Marketing, P.O.Box 4600, Oulu, Finland, mari.j.juntunen@oulu.fi
Abstract: The purpose is to study the relationship of soft (relationships and corporate brand image) and hard (relationship specific investments) commitments with external economies. A conceptual model is tested with SEM using empirical data from Finnish industrial companies. Response rate of survey was 22.5 % (N=235). The results show that corporate brand image and relationship-specific
investments are a supplement component of external economies in modular organization structure.

Wednesday, October 14

WA : 08:00 - 09:30 Technology Licensing and Creativity
Chair: Lee Davis, Associate Professor, Copenhagen Business School, INO, Kilevej 14A, 3rd floor, Frederiksberg DK-2000, Denmark, ld.ino@cbs.dk

1. An Investigation of Stock Market Seasonality
Lead: Eric Bentzen, Associate Professor, Copenhagen Business School, Dept. of Operations Management, Frederiksberg DK-2000, Denmark, eb.om@cbs.dk
Abstract: In this paper we investigate the January effect on stocks traded at NYSE, AMEX, and NASDAQ. Unlike other empirical works we suggest expanding the model to cover several main effects. By doing so we find that the January effect is not the only effect, and it cannot be rejected that the effect from selected years are so powerful that it can affect the empirical findings.

2. Realizing the Commercial Value of Employee Leisure Time Invention
Lead: Lee Davis, Associate Professor, Copenhagen Business School, INO, Kilevej 14A, 3rd floor, Frederiksberg DK-2000, Denmark, ld.ino@cbs.dk
Abstract: Managerial ability to combine different sources of employee knowledge can enhance innovation. There are many inventions where the flash of genius occurred while the inventor was away from work. But the resulting inventions are not necessarily valuable. This paper discusses four problems managers face in realizing this value: encouraging invention disclosure, facilitating knowledge transfer, minimizing leisure time shirking, and employee retention.

3. Technology Licensing and Market Entry under Compatibility Investments
Lead: Sinan Erzurumlu, Assistant Professor, Babson College, 231 Forest St, Tomasso 123, Babson Park MA 02457, United States of America, serzurumlu@babson.edu, Co-Author: Sreekrumar Bhaskaran, Asst. Professor, SMU-Cox School of Business, 6212 Bishop Blvd, Dallas TX 75205, United States of America, sbhaskar@cox.smu.edu
Abstract: We examine a situation in which the supplier develops a new technology which enables him to offer a quality product if the OEM undertakes investments to enhance the compatibility of the component with the product. We analyze the issue of when and how a supplier would license his technology to another supplier with which he also competes for the demand of the OEM.

4. Supply Network Configuration, Product Characteristics, and Ubiquitous Tracking Technology Adoption
Lead: Rahul Basole, Georgia Institute of Technology, Tennenbaum Institute, Atlanta GA 30332, United States of America, rahul.basole@iti.gatech.edu, Co-Author: Maciek Nowak, Assistant Professor, Loyola University Chicago, 1 E. Pearson Ave., Chicago IL 60611, United States of America, mnowak4@luc.edu
Abstract: Research has found that matching supply networks and product characteristics leads to higher firm performance; recent studies have also examined the influence of tracking technologies on supply networks. We integrate these two research streams by developing a theoretical framework and a set of research propositions, and present results from an expert study conducted with supply chain executives to better understand strategic management of emerging information technologies in supply networks.

WB : 11:00 - 12:30 Technology, QFD and Logistics Services
Chair: Juliana Hsuan, Associate Professor, Copenhagen Business School, Dept. of Operations Management, Solbjerg Plads 3, Frederiksberg DK 2000, Denmark, jh.om@cbs.dk

1. Technology Outsourcing
Lead: Rosine Hanna, PhD Student, Portland State University, Dept. of Engineering and Technology Man, Maseeh College of Engineering and Comp, Portland OR 97207-0751, United States of America, rosine@pdx.edu, Co-Author: Tugrul Daim, Professor, Portland State University, PO Box 751, Portland, United States of America, tugrul@pdx.edu, Scott Leavengood, Director, Oregon Wood Innovation Center, Oregon State University, 119 Richardson Hall, Corvallis OR 97331, United States of America, scott.leavengood@oregonstate.edu
Abstract: This study presents a model that facilitates understanding the challenges of outsourcing technology service and knowledge processes. The model identifies the vital challenges for such policies. It provides a sequential view of constructing firms’ capability in the technology service sector. A number of frameworks were created to clarify sourcing options and help decision makers in choosing which processes to outsource and which to in-source.

2. Integrating QFD and Knowledge Perceptual Map into a Bio-energy Technology Roadmap
Lead: Ann-Marie Lamb, PhD Student, Engineering & Technology Management, Portland State University, Portland, United States of America, ajlamb@pdx.edu, Co-Author: Tugrul Daim, Professor, Portland State University, PO Box 751, Portland, United States of America, tugrul@pdx.edu, Scott Leavengood, Director, Oregon Wood Innovation Center, Oregon State University, 119 Richardson Hall, Corvallis OR 97331, United States of America, scott.leavengood@oregonstate.edu
Abstract: This paper shows an application of strategic bio-energy industry technology roadmapping. Focus is on how two tools; quality function deployment and knowledge perceptual map, were combined to form a technology roadmap for wood pellet market drivers, technology, product, resources, and partnerships.

3. A Dynamic Programming Model for Project Selection with Unknown Return and Investment Characteristics
Lead: Senay Solak, Assistant Professor, University of Massachusetts, Isenberg School of Management, Amherst MA 01003, United States of America, solak@som.umass.edu, Co-Author: Mehmet Gumus, Professor, McGill University, 1001 Sherbrooke West, Montreal QC H3A1G5, Canada, mehmet.gumus@mcgill.ca
Abstract: We consider a firm allocating its resources to a set of projects or technologies. Facing stochastic returns with unknown parameters, the firm needs to decide on both which projects to select and how much to invest on the selected projects with the objective of maximizing total expected discounted profit. A dynamic programming formulation is proposed and some numerical results are presented.

4. Service and Process Structures in Logistics Services
Lead: Anu Bask, Senior Advisor, Helsinki School of Economics, POB 1210, Helsinki 00101, Finland, anu.bask@hse.fi, Co-Author: Mervi Rajahonka, Researcher, Helsinki School for Economics, POB 1210,
1. Understanding Corporate Social Responsibility (CSR): A Case Study in Gold Mining Operations in Peru
   Lead: Ana Maria Vidal Cobian, Doctoral Student, Pontificia Universidad Catolica de Lima - CENTRUM, Tacna 365 Lima 32 Peru, Alomias Robles 125, Los Alamos de Monterrico Surco 33, Peru, avidalcobian@hotmail.com, Co-Author: Oscar Aliaga, PhD, Pontificia Universidad Catolica del Peru -CENTRUM, Alomias Robles 125 Urb. Los Alamos, Surco, Lima 33, Peru, oaliaga@pucp.edu.pe
   Abstract: The topic of Corporate Social Responsibility (CSR) is examined through this case-study of a modern gold mining operation in Peru. Using the Stakeholders theory as a framework, managers and social leaders were interviewed revealing different understandings and approaches to CSR. The study aims to contribute to the discussions for international certification of CSR.

2. Quantification of Comprehensive Design Augmented Brand Value
   Lead: Soren Petersen, Copenhagen Business School, Frederiksberg, Denmark, soren.petersen@ingomar.net
   Abstract: Corporations with strong design and branding outperform the market by approximately 10%, while if only one of these is present; performance drops to 3%. Correctly conceptualizing five designer concept aspects, can significantly influence financial and trend setting performance. This underscores the importance of integrating design into one’s business plan.

   Lead: Daniel T. Eloi Santos, Doctoral Student, Federal University of Minas Gerais, Rua Sagitario, 232, Santa Lucia, Belo Horizonte MG 30360230, Brazil, daniel.eloi@pris.com.br, Co-Author: Leonardo Santiago, Federal University of Minas Gerais, Production Engineering Department, Av. Antonio Carlos, 6627 - Pampulha, Belo Horizonte MG, Brazil, lsantiago@ufmg.br
   Abstract: Our research considers the problem of pricing and advertising strategies for new products facing high competition during their lifecycle. We analyze four scenarios, considering pricing and advertising decisions and illustrate our model with an empirical example. We then discuss the case in which pricing and advertising decisions are made simultaneously, leading to a predatory competition.

4. Determinants of Foreign Direct Investment Using Gravity Model Approach
   Lead: Hoang T. Nguyen, Doctoral Student, Maastricht School of Management and Alliant International University, Dorpstraat 66, Maastricht 6227 BP, Netherlands, nguyenth@msm.nl, Co-Author: Geert Duysters, Professor Doctor, Eindhoven University of Technology, Netherlands, G.M.Duysters@tue.nl, James Patterson, Professor Doctor, Indiana University, Bloomington IN 47405, United States of America, patterson@indiana.edu, Harald Sander, Professor Doctor, University of Applied Sciences Cologne, Germany, sander@msm.nl
   Abstract: The aim of this paper is to study the determinants of foreign direct investment. By applying the gravity model and based on the UNCTD methodology for ranking a country’s inward FDI potential, we concurrently examine the impact of the push and pull driving force from source and recipient country. The evidence shows that both the host and home country characteristics influence the FDI inflows on the aspect of market conditions, cost of production, local business conditions, and government policy.

WC : 12:45 - 14:15 ***CANCELLED***Design and Brand Management
Chair: Tore Kristensen, Professor, Copenhagen Business School, Solbjerg Plads 3, Frederiksberg DK 2000, Denmark, tk.marktg@cbs.dk

1. ****LATE CANCELLATION****A Strategic Design Management Model for Promoting Brand Building
   Lead: Jordi Montana, Professor, ESADE Business School, Av. Pedralbes 60 - 62, Barcelona E-08034 Ba, Spain, jordi.montana@esade.edu, Co-Author: Isa Moll, Senior Researcher Chair of Design Management, ESADE, Pedralbes 60-62, Barcelona, Spain, isa.moll@esade.edu
   Abstract: New ways to promote brand building have been recognized of central importance for companies, as brands have become one of their most valuable assets. Design guided strategically by the brand can serve as a cohesive factor for all elements that take part in the brand experience. 37 top managers of 28 companies acclaimed for their design were interviewed in order to build a model based on design management that promotes brand building strengthening consistent brand experiences.

2. ****LATE CANCELLATION****Classifying Packaging Design Element
   Lead: Jesper Clement, Copenhagen Business School, Dept. of Marketing, Frederiksberg, Denmark, JC.marktg@cbs.dk
   Abstract: Consumers make their choice of daily commodities in-store and packaging design can be seen as a matter of getting consumers' visual attention. This paper presents taxonomy for design elements related to visual stimuli, and demonstrates how consumers’ eyes actually work in the moment of a purchase decision. The research is based on an eye-track experiment under real conditions in natural environment.

3. ****LATE CANCELLATION****Do Consumer Appreciate Good Design and Are They Also Willing to Pay for It?
   Lead: Gorm Gabrielsen, Copenhagen Business School, Denmark, gg.mes@cbs.dk, Co-Author: Tore Kristensen, Professor, Copenhagen Business School, Solbjerg Plads 3, Frederiksberg DK 2000, Denmark, tk.marktg@cbs.dk
   Abstract: This paper is based on three experiments conducted with each 2 different products; rice paper lamps and mens black shoes. The experiments were conducted in shopping malls where customers were intercepted in natural environments. The experiment based on paired comparisons using a computer based screen in addition to showing the real objects for people to touch, smell, lift.

WC : 14:45 - 16:15 Student Paper Session: MOTI
Chair: Fred Phillips, Professor, Maastricht School of Management and Alliant International University, 10622 Sunset Ridge Dr., San Diego CA 92131, United States of America, fphillips@alliant.edu
5. Inflation Points and Industry Change: Was Andy Grove Right After All?
   Lead: Joy Limprayoon, Doctoral Candidate, Alliant International University, 10455 Pomerado Rd., Marshall Goldsmith School of Management, San Diego CA 92131, United States of America, plimprayoon@alliant.edu, Co-Author: G. George Hwang, Assistant Professor, Shih Hsin University, Department of Economics, No. 111, Mu-Cha Rd. Sec. 1, Taipei 116, Taiwan - ROC, george@mail.shu.edu.tw, Fred Phillips, Professor, Maastrict School of Management and Alliant International University, 10622 Sunset Ridge Dr., San Diego ca 92131, United States of America, fphilips@alliant.edu
   Abstract: We examine whether the "strategic inflection points" described by former Intel CEO Andy Grove correspond to mathematical inflection points in the product/technology life cycle. We find one sense in which they do and two senses in which they do not. Managerial implications prove to be extensive and profound.

   WD : 16:30 - 18:00 Technology Management
   Chair: Wiljeana Glover, Virginia Tech, 250 Durham Hall (0118), Blacksburg VA 24073, United States of America, wiglover@vt.edu

   1. The Presence Ladder Model in the Console Game Industry
   Lead: Jai Kim, Associate Professor, Sungkyunkwan University, 89-5, Chungwoon Dong, Chongro-Gu, Seoul 110-130, Korea, Republic of, jaigeom@stanford.edu, Co-Author: Hosung Ahn, Staff, Doosan, Kangnam Ku, Seoul, Korea, Republic of, dominique.ahn@gmail.com, Samuel Chiu, Associate Professor, Stanford University, Turman Engineering Building, Palo Alto, United States of America, sam.chiu@stanford.edu, Jiyong Eom, Post Doc, Stanford University, Stanford, Palo Alto CA, United States of America, eomjiyong@gmail.com
   Abstract: This study first introduces the notion of "presence" in the Neo-Schumpeterian perspective and thereby provides useful insights into the strategy in technology-based companies. Major innovations in the console game market have occurred with major changes in the degree of presence that console game systems can provide. Based on an in-depth historical industry study, we propose the presence ladder model, in which the evolution of the console game industry is divided into three generations.

   2. Optimization of LED Warranty
   Lead: Oleg Bukhtiyarov, University of Alaska Anchorage, 727 Elm Street, 674, Anchorage AK 99501, United States of America, linousa@mail.ru, Co-Author: LuAnn Piccard, Instructor, University of Alaska Anchorage, ESPM 3211 Providence Dr., Anchorage AK 99508, United States of America, alp@uaa.alaska.edu, Hsueh-Ming Wang, University of Alaska Anchorage, ESPM Department 3211 Providence Dr, Anchorage AK, United States of America, ahsuw1@uaa.alaska.edu
   Abstract: This paper presents warranty estimation problem using a simulation approach. Warranty forecasting method based on stochastic iterations/infinitive games with dynamic change of product quality. Under a dynamic environment, simulation provides a warranty strategy for the market that maximizes their profit over time. And this paper describes optimal warranty strategy for LED technology in dynamic change.

   3. Study on the Evaluation of Talents Growth Based on Three-dimensional Capital Structure

   Lead: Li Mo, Chinese Academy of Sciences, 3BNanyitiao, Zhongguanuncn, Haidian Distr. Beijing 100190, China, jinyunmo@hotmail.com, Co-Author: Xia Xueqing, Hubei Airport Group, Human Resource Department, Wuhan Airport, Wuhan, China, goodman4822@126.com
   Abstract: This paper first argues that Human Capital, Social Capital, Psychological Capital work together to decide the competitiveness of talents and measure the value of talents. Based on this, this paper establish an index system to evaluate the talents growth, construct a three-dimensional capital structure model, and use research methods like factor analyze and linear regression to test them by empirically study method, and establish the exponential equation for talents growth.

   Lead: Wiljeana Glover, Virginia Tech, 250 Durham Hall (0118), Blacksburg VA 24073, United States of America, wiglover@vt.edu, Co-Author: Eileen Van Aken, Virginia Tech, 250 Durham Hall, Blacksburg VA 24073, United States of America, evanaken@vt.edu
   Abstract: A major obstacle for many organizations is to sustain the results of a Kaizen event after it concludes. This field study research of Kaizen events across multiple manufacturing organizations provides evidence of how Kaizen event characteristics, work area characteristics, and sustainability processes may influence the sustainability of outcomes. The study also considers how the findings may inform future research of Kaizen events in service organizations.
Sunday, October 11

SA : 08:00 - 09:30 Product, Project and Process Management
Chair: Nitin Joglekar, Boston University, School of Management, Boston, United States of America, joglekar@bu.edu

1. Optimal Product Introduction for Multiple Generations with Dynamic Pricing
Lead: Janice Carrillo, Associate Professor, University of Florida, P.O. Box 1171769, Gainesville FL 32611-7169, United States of America, janice.carrillo@cba.ufl.edu, Co-Author: Michelle Ser ef, Doctoral Student, University of Florida, P.O. Box 117169, Gainesville FL 32611-7169, michelle.hanna@cbu.ufl.edu
Abstract: When planning for the introduction of a stream of new products into the marketplace, managers must consider both the timing and dynamic pricing decisions to determine an appropriate entry strategy. In this paper, we consider multiple generations of a single product with sales as a function of both price and diffusion. In addition to solving for the optimal pricing policy for each generation, we find the optimal number of generations that the firm should produce within a finite planning horizon.

Lead: Edward G. Anderson Jr., Associate Professor, University of Texas at Austin, 1 University Station B6500, CBA 3.430, Austin TX 78712, United States of America, Edward.Anderson@mccombs.utexas.edu, Co-Author: John Paul Macduffie, Professor, Wharton School, University of Pennsylvania, Philadelphia pa 78733, United States of America, macduffie@wharton.upenn.edu, Geoffrey G. Parker, Associate Professor, Tulane University, A. B. Freeman School of Business, New Orleans LA 70118, United States of America, gparker@tulane.edu
Abstract: We present results from interviews with project managers at 12 different firms in the videogame industry, which is notorious for late and over-budget projects. Using qualitative data, we seek to answer the following questions: (1) Is managing videogame projects different from managing other software projects? (2) What are the implications of these differences—if they exist—for managing the videogame software supply chain? (3) and how are these practices evolving over time?

3. Production and Process Investment Decisions for a Startup
Lead: Nitin Joglekar, Boston University, School of Management, Boston, United States of America, joglekar@bu.edu, Co-Author: Sinan Erzurumlu, Assistant Professor, Babson College, 231 Forest St, Tomasso 123, Babson Park MA 02457, United States of America, serzurumlu@babson.edu, Fehmi Tanriserver, University of Texas, Fehmi.Tanriserver@phd.mccombs.utexas.edu
Abstract: We examine the long-term process investment and short-term production decisions of a startup under bankruptcy risk and a debt constrain. We show that bankruptcy risk may either induce aggressive or conservative investment behavior, along with a deviation from monopoly production quantity depending on market conditions, compared to the case with no bankruptcy risk. On the other hand, a tight debt capacity always reduces the propensity to invest and leads to more conservative production decisions.

4. Exploring Core-Periphery Structures in Complex Software Products
Lead: Alan MacCormack, Visiting Associate Professor, MIT Sloan School of Management, 50 Memorial Drive, E52, Cambridge MA 02142, United States of America, alanmac@mit.edu
Abstract: Prior work argues that technical systems possess a "Core-Periphery" structure, in which tightly-coupled "Core" components are surrounded by loosely-coupled "Peripheral" components. However, little work has explored if such structures are observed in practice, or what factors dictate the size and growth of the core. We examine these questions using data from over 1,000 software systems. We show that Core-Periphery structures dominate, and reveal data on the size and composition of the cores.

SB : 11:00 - 12:30 Panel Discussion: Teaching Interdisciplinary Courses in Product Design and Development
Chair: Sebastian Fixson, Babson College, Tomasso 226, Babson Park MA 02457, United States of America, sfixson@babson.edu

1. Panel Discussion: Teaching Interdisciplinary Courses in Product Design and Development
Lead: Sebastian Fixson, Babson College, Tomasso 226, Babson Park MA 02457, United States of America, sfixson@babson.edu, Co-Author: Sara Beckman, Senior Lecturer with Security of Employment, Haas School of Business, University of California, Berkeley, S545 Student Services Building #1900, Berkeley CA 94904, United States of America, beckman@haas.berkeley.edu, Nitin Joglekar, Boston University, School of Management, Boston, United States of America, joglekar@bu.edu, William Lovejoy, University of Michigan, 701 Tappan, Ann Arbor, United States of America, wlovejoy@umich.edu, Michael Meyer, michael@flightsked.com, Manuel Sosa, Associate Professor of Technology and Operations Management, INSEAD, Boulevard de Constance, Fontainebleau 77305, France, manuel.sosa@insead.edu
Abstract: Come and join us for a discussion of the past, present, and future of interdisciplinary courses in product design and development (PDD). Our panel of accomplished teachers who have successfully developed and executed their versions of PDD courses will share their experiences, insights, and advice.
1. Impact of the Cost of Components and Demand Risk in the Selection of a Product Platform
   Lead: Saurabh Bansal, UT Austin, Austin, Austin TX, United States of America,
   Saurabh.Bansal@phd.mccombs.utexas.edu, Co-Author: Genaro Gutierrez,
   UT Austin, Austin, Austin, United States of America,
   Genaro.Gutierrez@mccombs.utexas.edu
   Abstract: We explore conditions under which a common platform is preferred over separate platforms when these platforms are to be coupled with vertically differentiated components manufactured by a co-production system. We model the two tradeoffs between the higher cost of the common platform and its two benefits: (i) downward substitution of the co-produced component, and (ii) operational hedge. We identify the co-production yields, and the demand uncertainties under which the common platform is preferred.

2. Strategic Information Disclosure in Competitive R&D Projects
   Lead: Yi Xu, Assistant Professor, Robert H. Smith School of Business, University of Maryland, College Park MD 20742, yxiu@rhsmith.umd.edu, Co-Author: Manu Goyal, Assistant Professor, Robert H. Smith School of Business, University of Maryland, mngoyal@rhsmith.umd.edu
   Abstract: Firms often form beliefs on how lucrative an R&D project is based on competing firms’ R&D spending and success. We analyze such a scenario where a Leader firm’s R&D effort is interpreted by a Follower firm to customize its own research foray. Thus the Leader firm strategically distorts its R&D effort in an attempt to mislead the Follower firm the distortion depends crucially on whether the uncertainty is on the technological dimension of the R&D project, or on the market potential.

3. Platform Feature Investment in the Presence of Network Externalities
   Lead: Burcu Tan, PhD Candidate, University of Texas at Austin, IRGM, B6500, 1 University Station, Austin TX 78712, United States of America,
   Burcu.Tan@phd.mccombs.utexas.edu, Co-Author: Edward G. Anderson Jr, Associate Professor, University of Texas at Austin, 1 University Station B6500, CBA 3.430, Austin TX 78712, United States of America,
   Edward.Anderson@mccombs.utexas.edu, Geoffrey G. Parker, Associate Professor, Tulane University, A. B. Freeman School of Business, New Orleans LA 70118, United States of America, gparker@tulane.edu
   Abstract: We examine the development of product platforms in markets that exhibit network externalities. We focus on the trade-offs firms must make between investing new product development resources to increase a platforms core functionality versus investments designed to change or leverage the platforms network externalities. Abstracting from examples drawn from multiple industries, we use a strategic model to gain intuition about how to make such trade-off decisions.

4. How Should Universities Participate in the Profits of University Spinouts?
   Lead: Nicos Savva, London Business School, Regent's Park, London NW1 4SA, United Kingdom,
   nsavva@london.edu, Co-Author: Niyazi Ozttoprak, Judge Business School, University of Cambridge, Cambridge, United Kingdom, n.oztoprak@jbs.cam.ac.uk
   Abstract: We examine how should a University participate in the profits of a venture capital (VC) backed spin-out company that commercialises the outcome of academic research. We assume that the VC is better informed about the cost of development than the University. We examine the trade-offs of royalty and equity participation under asymmetric information and identify mechanisms that incentivise the VC to reveal the true cost estimates.

5. Complexity and Efficiency of Globally Distributed Vehicle Design
   Lead: Bilal Gokpinar, Lecturer, University College London, United Kingdom, b.gokpinar@ucl.ac.uk, Co-Author: Wallace Hopp, Professor, University of Michigan, Ross School of Business, Ann Arbor 48118, United States of America, whopp@umich.edu, Seyed Iravani, Associate Professor, Northwestern University, 2145 Sheridan Road, Evanston IL 60208, United States of America, s.iravani@northwestern.edu
   Abstract: We study the vehicle development process of a large auto manufacturer, whose design teams span the globe. Using networks to characterize both the product architecture and design team coordination, we investigate the impact geographic separation of design teams has on the operational efficiency and product quality of the system. Our results suggest that splitting subsystem design across geographic boundaries can have a deleterious effect on performance.

   Lead: Manuel Sosa, Associate Professor of Technology and Operations Management, INSEAD, Boulevard de Constance, Fontainebleau 77305, France, manuel.sosa@insead.edu, Co-Author: Tyson Browning, Texas Christian University, Tandy Hall 292C, Fort Worth TX 76129, United States of America, tbrowning@tcu.edu, Jurgen Mihm, Assistant Professor, INSEAD, Boulevard de Constance, Fontainebleau 77305, France, jurgen.mihm@insead.edu
   Abstract: We examine a large longitudinal sample of bugs associated with several open source applications developed by Apache. We study the link between software architectural properties and time to fix bugs. Our results suggest that some architectural properties of software applications are important determinants of bug fixing time.
methods. Innovation happens in a combination of target fulfillment and offering new solutions and combines products, processes and structures. We show a modeling representation of strategy deployment, and present multiple case study results.

Monday, October 12

MA : 08:00 - 09:30  Empirical Research in New Product Development
Chair: Kamalini Ramdas, Professor, London Business School, kramdas@london.edu

1. Technological Spillovers and the Agglomeration of the Semiconductor Industry in Silicon Valley
Lead: Francisco Veloso, fveloso@cmu.edu, Co-Author: Steven Klepper, Carnegie Mellon University, Social and Decision Sciences, Pittsburgh, United States of America, sk3l@andrew.cmu.edu; Jon Kowalski, Carnegie Mellon University, Engineering and Public Policy, Pittsburgh, United States of America, jon@jonkowalski.com
Abstract: We investigate the microfoundations of technological spillovers in clusters. When these result from information exchange or employee mobility, existing firms in clusters should move to the technological frontier faster. But when the conduit is spinoffs, firms in clusters are likely to start at the technological frontier. Using data on virtually every firm that entered the semiconductor industry and their entire set of products, we find that knowledge diffused mostly through spinoffs.

2. Creative Problem Solving: A Tournament Approach
Lead: Karan Girotra, Assistant Professor, INSEAD, Boulevard De Constance, Fontainebleau, France, karan.girotra@insead.edu, Co-Author: Christian Terwiesch, Professor, The Wharton School, 548 JMH, Philadelphia PA 19104, United States of America, terwiesch@wharton.upenn.edu, Karl Ulrich, The Wharton School, Univ of PA, 3730 Walnut St., Philadelphia, United States of America, ulrich@wharton.upenn.edu
Abstract: Creative problem solving often entails an iterative process of generation of multiple solutions to a problem followed by the selection and refinement of the top few. We examine the effectiveness of alternate solution generation, selection and refinement processes. We propose metrics for evaluation of each of the subprocesses and suggest strategies to improve the outcome of the Creative Problem Solving Exercise.

MB : 11:00 - 12:30 A deep-dive session on Empirical NPD Research
Chair: Christoph Loch, Professor, INSEAD, Boulevard de Constance, Fontainebleau, France, Christoph.LOCH@insead.edu

1. Understanding the Dynamics of Contracting Regimes in Software Product Development Outsourcing
Lead: Sandra Slaughter, Professor of Information Technology Management and Alton M. Costley Chair, Georgia Tech College of Management, 800 W. Peachtree St. NW, Atlanta GA 30308, United States of America, sandra.slaughter@mgt.gatech.edu, Co-Author: Soon Ang, Professor, Nanyang Technological University, Nanyang Avenue 639798, Singapore, Singapore, asang@ntu.edu.sg; Donald Harter, Assistant Professor, Syracuse University, 721 University Avenue, Syracuse NY 13244, United States of America, dharter@syr.edu
Abstract: This paper analyzes shifts in contracting regimes using longitudinal data on software development contracts between a software vendor and client over twenty years. Our results suggest that the changes in contracting regimes cannot be fully explained by standard explanations from contracting theory. We identify the factors that complement contractual governance in this setting.

2. Using Networks to Evaluate Misalignment Between a Design Organization and its Product Architecture
Lead: Wallace Hopp, Professor, University of Michigan, Ross School of Business, Ann Arbor 48118, United States of America, whopp@umich.edu, Co-Author: Bilal Gokpinar, Lecturer, University College London, United Kingdom, bgokpinar@ucl.ac.uk, Seyed Iravani, Associate Professor, Northwestern University, 2145 Sheridan Road, Evanston IL 60208, United States of America, s. iravani@northwestern.edu
Abstract: We examine the vehicle development process of a large auto manufacturer. Using networks, we characterize vehicle architecture, formal communication patterns between design teams, and misalignments between the two. We show that these misalignments are positively correlated with warranty claims. Our results suggest that quality can be improved by better aligning organizational communication with product architecture and that social network analysis can be done without surveys.

MC : 13:30 - 15:00 The Role of Incentives and Behavior in New Product Innovation Projects
Chair: Vish Krishnan, Professor, University of California, Rady School of Managemen, 9500 Gilman Drive MC 0553, La Jolla CA 92037, United States of America, vkrishnan@ucsd.edu

1. The Effects of Implicit and Explicit Incentives on NPD Portfolio Selection
Lead: Stylianos Kavadias, Associate Professor, Georgia Institute of Technology, 800 W. Peachtree Street, Atlanta GA 30308, United States of America, Stylianos.Kavadias@mgt.gatech.edu, Co-Author: Jeremy Hutchison-Krupat, Georgia Institute of Technology, 800 W. Peachtree St. NW, Atlanta GA 30308, United States of America, jhk@gatech.edu
Abstract: A firm portfolio of new product initiatives is widely recognized as a key ingredient to the long-term success. However past research has overlooked an important aspect: defining a portfolio of initiatives can not be equated to choosing from a menu. We recognize that such initiatives are defined by and within the organization, and we shed light on how incentives (implicit and explicit), information asymmetry and the risk associated with the initiative, affect the resulting portfolio.

2. Managing Projects with Present-Biased Agents
Lead: Yaozhong Wu, NUS Business School, 1 Business Link, Singapore, Singapore, bizwzyz@nus.edu.sg, Co-Author: Vish Krishnan, Professor, University of California, Rady School of Management, 9500 Gilman Drive MC 0553, La Jolla CA 92037, United States of America, vkrishnan@ucsd.edu, Karthik Ramachandran, SMU Cox School of Business, 6212 Bishop Blvd, Dallas TX 75205, United States of America, karthik@cox.smu.edu
Abstract: This study analytically examines the project team-level effects of a common individual bias in intertemporal decision making, the present bias, which causes workers to leave more work for later completion. We develop key managerial insights about the magnitude and timing of project payments, constitution of the project team and the management of information asymmetry among
such agents, and discuss the implications of our analysis and results for managers of different types of projects.

MD : 16:30 - 18:00 Panel Discussion: Research Priorities in Innovation
Chair: Sanjiv Erat, University of California San Diego, 9500 Gilman Drive, La Jolla CA 92039, United States of America, serat@ucsd.edu

Panel Discussion: Research Priorities in Innovation
Lead: Sanjiv Erat, University of California San Diego, 9500 Gilman Drive, La Jolla CA 92039, United States of America, serat@ucsd.edu, Co-Author: Bruno Cassiman, ISE
Business School and KULeuven, Avenida Pearson 21, Barcelona, Spain, bcassiman@iese.edu, Kamalini Ramdas, Professor, London Business School, kramdas@london.edu, Christian Terwiesch, Professor, The Wharton School, 548 JMHH, Philadelphia PA 19104, United States of America, terwiesch@wharton.upenn.edu

Abstract: The panel will feature the new Department Editors of Management Science, Kamalini Ramdas, Christian Terwiesch, and Bruno Cassiman. The discussion shall encompass both priorities for the journal, as well as a broader discussion of the “burning” research questions in Innovation. The main goal will be to exchange ideas, views, opinions about what areas in Innovation are under-researched and why, and to help spur new research and collaborations.

Tuesday, October 13

TA : 08:00 - 09:30 Strategies for Managing Incremental and/or Radical Innovation
Chair: Raul Chao, Darden Graduate School of Business, 100 Darden Blvd., Charlottesville VA 22903, United States of America, chaor@darden.virginia.edu

1. Connecting Industry to Science
Lead: Bruno Cassiman, ISE Business School and KULeuven, Avenida Pearson 21, Barcelona, Spain, bcassiman@iese.edu, Co-Author: Sam Arts, KULeuven, Naamsestraat 69, Leuven, Belgium, Sam.Arts@econ.kuleuven.be, Reinhilde Veugelers, KULeuven, Naamsestraat 69, Leuven, Belgium, Reinhilde.Veugelers@econ.kuleuven.be

Abstract: The paper studies the role of IMEC, a world leading independent research institute in the area of nanotechnology, as a bridge between science and industry. Our patent dataset defining the span of IMEC consists of more than 20,000 unique inventors and 4,500 unique applicants, including around 2,300 companies, 100 universities and 100 research centers. We examine the underlying mechanisms through which such industry-science links affect the innovation performance of organizations and inventors.

2. Beyond Ambidexterity: Understanding the Balance between Exploration and Exploitation
Lead: Drew Hess, University of Virginia, PO Box 400173, Charlottesville VA, United States of America, hess@virginia.edu, Co-Author: Sam Ransbotham, Boston College, Chestnuthill, Boston, United States of America, sam.ransbotham@bc.edu

Abstract: It is established that innovation requires ambidexterity -balancing exploration and exploitation. We move beyond the question of whether ambidexterity is important and instead focus on understanding this balance.

Although the term balance implies an even ratio of exploratory to exploitive projects, it is unlikely that an even ratio is optimal. We examine the composition of this ratio and the patterns of firm exploration and exploitation choices by analyzing 34K projects in the pharma industry.

3. The Big Picture: Exploring the Performance Implications of Being at the Technological Frontier
Lead: Om Narasimhan, University of Minnesota, 321 19th Ave. South, Minneapolis, United States of America, naras002@umn.edu, Co-Author: Rajesh Chandy, London Business School, Regent's Park, London, United Kingdom, rchandy@london.edu, Prokriti Mukherji, University of Minnesota, 321 19th Ave. South, Minneapolis, United States of America, mukhe009@umn.edu, Madhu Viswanathan, University of Minnesota, 321 19th Ave. South, Minneapolis, United States of America, viswa022@umn.edu

Abstract: We examine the performance impact of operating at the technological frontier in high-tech markets, and how firms’ decisions to outsource core technologies impacts the likelihood of being at the frontier. We address these issues in the context of the digital television industry in the North American, Japanese, and European markets.

4. Organization Structure, Incentives, and the Innovation Portfolio
Lead: Raul Chao, Darden Graduate School of Business, 100 Darden Blvd., Charlottesville VA 22903, United States of America, chaor@darden.virginia.edu, Co-Author: Stylianos Kavadias, Associate Professor, Georgia Institute of Technology, 800 W. Peachtree Street, Atlanta GA 30308, United States of America, Stylianos.Kavadias@mgt.gatech.edu

Abstract: In an attempt to deliver significant growth beyond the near term, many organizations have turned to grassroots innovation - bottom-up processes that access the ideas of all employees in the organization. Institutionalizing grassroots innovation is difficult because it requires interaction between employees that span the entire breadth and depth of the organization. In this study we explore the organization structures and incentives that help or hinder grassroots innovation initiatives.

TB : 11:00 - 12:30 Perspectives on Product Development Challenges
Chair: Stylianos Kavadias, Associate Professor, Georgia Institute of Technology, 800 W. Peachtree Street, Atlanta GA 30308, United States of America, Stylianos.Kavadias@mgt.gatech.edu

1. Design and Introduction of Conspicuous Durable Products
Lead: Vishal Agrawal, Georgia Institute of Technology, 800 W Peachtree St NW, Atlanta GA 30308, United States of America, vishal.agrawal@mgt.gatech.edu, Co-Author: Stylianos Kavadias, Associate Professor, Georgia Institute of Technology, 800 W. Peachtree Street, Atlanta GA 30308, United States of America, Stylianos.Kavadias@mgt.gatech.edu, Beril Toktay, Georgia Institute of Technology, 800 W Peachtree St NW, Atlanta GA 30308, United States of America, Beril.Toktay@mgt.gatech.edu

Abstract: We study the implications of exclusivity-seeking consumer behavior (snob effect) on the durability and pricing choices of the firm. There is an extensive body of literature that argues for the benefit of designing products with low durability (planned physical obsolescence). We show that in presence of exclusivity-seeking consumer behavior, firms should design products that undergo slow
value erosion coupled with a high-price, low-volume product introduction strategy.

2. **Launching a Thousand Ships: Incentives for Parallel Innovation**
   Lead: **Florian Ederer**, Assistant Professor, UCLA Anderson, 110 Westwood Plaza, Los Angeles CA 90095, United States of America, ederer@mit.edu
   **Abstract:** In a setting where workers can freely exchange ideas under-exploration may result as workers free-ride. Optimal incentives for routine activities take the form of individual pay-for-performance, while for parallel innovation they tolerate early failure and provide long-term group incentives for joint success. Using data from a laboratory experiment I show that this link is causal. Innovation success is highest when subjects receive a group incentive scheme that rewards long-term joint success.

3. **The Impact of Different Types of Input in the Design of Assistive Technology Products**
   Lead: **Young-Mi Choi**, Ph.D. Candidate, Center for Assistive Technology and Environmental Access (CATEA), 490 Tenth Street, Atlanta, Atlanta GA 30332-0156, United States of America, christina.choi@gatech.edu
   **Abstract:** One of the challenges facing developers of new Assistive Technology (AT) products is in utilizing input gathered from end users during the design process to gain a full understanding of their needs. A controlled design study was undertaken to measure how different types of input (from end users, therapists and simulation) during the design process affect the level of satisfaction and effectiveness of the finished AT product. The goal is to identify possible ways to improve the design process.

TC : 13:30 - 15:00 New Product Development I
Chair: **Sidharth Rupani**, PhD Candidate, MIT, 550 Memorial Drive, Apt. 23B4, Cambridge MA 02139, United States of America, sidrup@mit.edu

1. **Aligning Sources of External Knowledge in New Product Development with Choice of Generic Strategy**
   Lead: **Fabrizio Salvador**, Professor, Instituto de Empresa, C/Maria de Molina 11, Madrid 28006, Spain, Fabrizio.Salvador@ie.edu, Co-Author: **Anil Akpinar**, PhD Candidate, Instituto de Empresa, C/Maria de Molina 12 Bajo, Madrid 28006, Spain, akpinar.phd2012@alumno.ie.edu
   **Abstract:** In NPD literature, it has been already acknowledged that firms should acquire knowledge from external sources to complement their internal knowledge. In this paper we explore the role of generic strategies in deciding which external sources to use for a superior innovation performance. We hypothesize and provide empirical evidence that under differentiation strategy customer involvement will result in superior innovation performance whereas cost leadership benefits from supplier involvement.

2. **Alternative Supply Chain Management Strategies for New Product Diffusion: An ABMS Approach**
   Lead: **Mohammad Amini**, The University of Memphis, 365 Innovation Drive, Memphis, United States of America, mamin@memphis.edu, Co-Author: **Mohammad Nejad**, University of Memphis, Fogelman College of Business, Memphis, United States of America, nghoresh@memphis.edu, **Mike Racer**, Associate Professor, University of Memphis, 302 Fogelman, Memphis TN 38152, United States of America, mracer@memphis.edu, **Tina Wakolbinger**, University of Memphis, Fogelman College of Business 332, Memphis TN 38152, United States of America, twakolbinger@memphis.edu
   **Abstract:** In this paper, we develop an agent-based model to simulate the effect of alternative supply chain strategies on the diffusion process of a new product. The potential demand market consists of 3,000 customers interconnected through their social network. The diffusion process is driven by positive and negative word-of-mouth, marketing efforts, and capacity restrictions. Using extensive computational experimental design, we compare the NPV of profit generated by alternative strategies.

3. **Alliance Depth, Success and Strategic Orientation of the Firm: Evidence from the Biotech Industry**
   Lead: **Manpreet Hora**, Assistant Professor, Georgia Institute of Technology, 800 W Peachtree St. NW, Atlanta GA 30328, United States of America, manpreet.hora@mgt.gatech.edu, Co-Author: **Devkamal Dutta**, University of New Hampshire, Dept. of Management, WBSE, University of New Hampshire, Durham NH 03824, United States of America, Dev.Dutta@unh.edu
   **Abstract:** We study the role alliance partnerships between biotech entrepreneurial firms and mainstream drug companies play in ensuring entrepreneurial success through the product development life-cycle for introduction of new drugs. Examining over 1000 alliances in the US biotech industry spanning a five-year period (2004-2008), we investigate the relationship between alliance depth, success, and the biotech firm’s strategic orientation.

4. **The Soft Resource Allocation Problem**
   Lead: **Fo’ad Iravani**, UCLA Anderson School of Management, 110 Westwood Plaza, Suite B512, Box 951481, Los Angeles CA 90095-1481, United States of America, foad.iravani.2012@anderson.ucla.edu, Co-Author: **Reza Ahmadi**, Professor, UCLA Anderson School of Management, 110 Westwood Plaza, Los Angeles CA 90095-1481, United States of America, reza.ahmadi@anderson.ucla.edu, **Sriram Dasu**, University of Southern California, BRI 401U, Los Angeles CA 90089, United States of America, Dasu@marshall.usc.edu
   **Abstract:** We propose a hierarchical framework for organizing and staffing a product development process at a leading software company that produces tax software. Every year, the firm struggles with a high workload imposed by thousands of changes in tax rules announced by the IRS. These changes have to be processed and incorporated into the next generation of the product by mid-December. We develop models for organizing and staffing the development activities to meet the deadline at the lowest cost.

5. **Product Development Process Standardization in Multi-Project Organizations**
   Lead: **Sidharth Rupani**, PhD Candidate, MIT, 550 Memorial Drive, Apt. 23B4, Cambridge MA 02139, United States of America, sidrup@mit.edu
   **Abstract:** The overarching question of this paper is what is the right level of variation across product development processes in a multi-project organization? Process standardization offers learning and efficiency benefits, but process diversity could allow widely varying projects to better vary meet project targets of cost, schedule, and quality. This paper builds on a broad survey of the literature and detailed company case studies to lay out a framework to manage this tradeoff.
1. Developing a Model for Product Modularity Using Multi-objective Optimization
   Lead: Jebum Pyun, Korea University / Business School, Anam-dong, Seongbuk-gu, Seoul 136-701, Korea, Republic of, chenille@korea.ac.kr. Co-Author: DaeSoo Kim, Professor, Korea University / Business School, Anam-dong, Seongbuk-gu, Seoul 136-701, Korea, Republic of, kimd@korea.ac.kr. Myung-sub Park, Professor, Korea University / Business School, Anam-dong, Seongbuk-gu, Seoul 136-701, Korea, Republic of, mspark@korea.ac.kr.
   Abstract: The modularity has been known as a method to efficiently deal with diverse customers’ needs along with postponement and mass customization. However, there are many conflicts arisen from it as well. Despite the importance in practice, there are only a few analytic studies. Thus, this research develops an analytic model for examining positive and negative effects of product modularity using multi-objective optimization.

2. Time-to-market and Quality Trade-off
   Lead: Ali Yassine, Professor, American University of Beirut, Beirut, Lebanon, Lebanon, ay11@aub.edu.lb.
   Abstract: A model is presented to study the tradeoff between time-to-market and product quality for different product development (PD) scenarios. These scenarios differ in four major factors: product complexity, task size, firm capability, and market nature. The objective of the proposed model is to maximize the profit with respect to a time limited window.

3. A Design Partner Selection Model for Design Chain Collaboration
   Lead: Jia-Ying Chen, PhD student, National Taiwan University, College of Management Floor 9, No.1, Sec. 4, Roosevelt Road, Taipei, Taiwan - ROC, d95741002@ntu.edu.tw. Co-Author: Ming Huang Chiang, Professor, National Taiwan University, College of Management Floor 9, No.1, Sec. 4, Roosevelt Road, Taipei, Taiwan - ROC, cmh@ntu.edu.tw. Ruey-Shan Guo, Professor, National Taiwan University, College of Management Floor 9, No.1, Sec. 4, Roosevelt Road, Taipei, Taiwan - ROC, rsguo@ntu.edu.tw.
   Abstract: Due to the increasing global competition and shortening product life for a new product, the brand owner increasingly collaborates with design chain partners to bring a new product to the market. As a result, this paper proposed a design partner selection model, which takes into account time-to-market, cost, and quality. An algorithm is also developed for this model to select the optimal partners through the design chain. Finally, a numerical example is presented.

4. A Theory of Next Generation Products
   Lead: Yi Zhu, University of Southern California, 3660 Trousdale Parkway, ACC 306E, Department of Marketing, USC, Los Angeles CA 90089, United States of America, zhuy@usc.edu. Co-Author: Lan Luo, Assistant Professor of Marketing, University of Southern California, 3660 Trousdale Parkway, ACC 306E, Department of Marketing, USC-Marshal Sch, Los Angeles CA 90089, United States of America, lluo@marshall.usc.edu.

5. Licensing Contracts: Options and Control Rights
   Lead: Pascale Crama, Assistant Professor, Singapore Management University, 50 Stamford Road, Singapore, Singapore, pcrama@smu.edu.sg.
   Abstract: Firms often launch next generation products to replace previous generation products. However, sometimes we also observe firms continue to produce and support the old generation products long after they launch the new generation products. We investigate how firms can exploit the interplay between the two generation products for profit maximization.

Continued from page 1:

This year the Technology Management Section honors a long-time, steadfast leader of the INFORMS technology management community, a familiar face in TMS conference sessions, and a person who has made numerous important contributions to INFORMS TMS and the technology management community at large. See the newsletter article for more details regarding our 2009 TMS Distinguished Service Award winner, Professor Cheryl Gaimon, holder of the Richard and Carol Kalikow Professorship and Regents’ Professor in the College of Management at the Georgia Institute of Technology. The TMS distinguished service award recognizes extraordinary leadership and service within the INFORMS TMS community. We will present this well-deserved award to Professor Cheryl Gaimon during the TMS business meeting in San Diego, which will be held on Monday, 12 October, 18:00 – 19:30. Please attend the TMS business meeting, join us for refreshments, and congratulate Cheryl Gaimon in person!

We owe special thanks to two TMS members who volunteered during the 2008 TMS business meeting and have made valuable contributions to TMS working on special projects during 2009. Steve (Hsueh-Ming) Wang, University of Alaska, Anchorage completed a project that ensured the TMS mailing list contained valid email addresses for all current members. TMS Chief Information Officer Ken Hung played a key role in this project, analyzing the TMS email list, identifying the missing email addresses, which I asked Steve to collect, and updating the TMS email list with Steve’s results.
Andrew Nelson, University of Oregon, analyzed INFORMS TMS membership data covering 2002-2008, providing empirical evidence to help guide TMS decision-making as we work to increase the value TMS creates for all TMS members. Some of Andrew's results appear in my newsletter article, entitled “Managing Trends in TMS Finances and Membership”. I have invited Steve Wang and Andrew Nelson to join all TMS officers at our annual dinner, in appreciation of their exemplary volunteer efforts on behalf of the Technology Management Section.

We also thank Charles Weber and his students at Portland State University, for their initiative to create the website http://tmsnet.ning.com, which hosts all sorts of cool and useful communication and social networking tools designed specifically for members of the technology management community. I have created a discussion forum for INFORMS TMS members on this by-invitation-only social networking site. Check it out! If you have not already received an invitation email from Charles Weber, you may request an invitation by sending email to charles.weber@etm.pdx.edu.

In closing, I would like to remind everyone that TMS will elect a new Vice Chair of Membership and Communications at year’s end, and nominations for this position will be accepted through the end of the annual meeting. Nominees who attend the business meeting will have an opportunity to introduce themselves and say a few words to everyone at the meeting.

The 2009 TMS business meeting will also be the perfect place to begin planning TMS conference sessions for 2010. Contact (incoming) TMS Vice Chair of Programs Nile Hatch to discuss your plans to organize one or more conference sessions for the 2010 TMS program, or talk to Nile during the business meeting. Be bold! The possibilities you imagine today and discuss with Nile may become reality during the 2010 annual meeting.

It has been my privilege to serve as your 2009 TMS Chair, thank you!

David Moore, Ph.D.
Chair, INFORMS Technology Management Section

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**Call for Papers**

**International Journal of Innovation and Technology Management**

**Special Issue on Managing Knowledge, Learning and Intellectual Capital (KLIC)**

Submission date: June 30th, 2010

**Guest Editor**

Charles Weber (Portland State University)

**Motivation**

In the 21st Century the wealth and competitive advantage of organizations, firms, regions and nations is increasingly derived from the ability to create, generate, procure, transform, transfer and utilize knowledge and intellectual capital. Yet, the structures, processes, routines and procedures that underlie managing KLIC are not completely understood. This special issue of the International Journal of Innovation and Technology Management (IJITM) hopes to generate insight into how KLIC is managed effectively and how managing KLIC effectively contributes to wealth competitive advantage and competitive advantage.

**Topics and Research Questions of Interest**

A sample of topics and research questions that are, among others, of interest to the special edition is given below.

**Individuals, groups and organizations:** How to individuals, groups and organizations interact, to generate, integrate, transfer and apply knowledge and intellectual capital? How can the wisdom of individuals and teams be integrated synergistically?

**Organizational ontology:** How does one best represent the knowledge of individuals, groups and organizations?

**Organizational epistemology:** Knowledge -- procedural versus declarative; tacit and implicit versus explicit. How is knowledge transformed within an organization and best transferred across organizations? What is the nature of technological knowledge? How does knowledge evolve over the lifecycle of an industrial process?

**Firm size:** How is KLIC managed most effectively in small, entrepreneurial firms and in large corporations? How do effective learning practices vary with firm size?
Knowledge-based views of the firm: How are firm-internal knowledge and firm-external knowledge integrated and transformed into capabilities?

The dynamics of learning and innovation: How can potential conflicts between learning and innovation be resolved? How can radical organizational learning occur without radical organizational change?

Operations Issues: How does organizational learning occur in the multi-product environment? How does an organization that produces for multiple economic environments learn?

Organizational wisdom: How can knowledge that was acquired in one specific context be applied to other contexts?

Intellectual property and intellectual capital: What are the most effective strategies for protecting intellectual property? How does a firm benefit most from its intellectual capital?

Organizations and environments: How does one integrate market knowledge and technological knowledge to deliver the right product to the right customer at the right time? How are knowledge, learning and intellectual capital best managed within a business ecosystem? Where is knowledge stored within an ecosystem? How can it be accessed?

Synchronous and long-distance learning: How can problems get solved synchronously or simultaneously across geographic and organizational boundaries?

Geography and intellectual capital: How do regions benefit from knowledge, learning and intellectual capital? What can policy makers do to convert KLIC into wealth and competitive advantage for their regions? What can firms do to take advantage of knowledge spillovers?

KLIC and sustainable practices: What special approaches to managing KLIC have to be taken to implement sustainable practices?

We would like to encourage the submission of empirical papers, whether qualitative or quantitative, exploratory or confirmatory. However, conceptual, theoretical, or modeling papers (with reference to the abovementioned phenomena) will also be considered. Interdisciplinary approaches are encouraged.

Deadline and Submission Instructions
The deadline for submission of papers is September 30th, 2010. Please submit your papers to the special issue editors directly.

Review Process and Special Issue Conference
Papers will be reviewed following the regular International Journal of Innovation and Technology Management double-blind review process. It takes an average of four weeks to obtain the first round of reviews.

More Information
For additional information, please contact the special issue editors:
Charles Weber — Charles.Weber@etm.pdx.edu

TMS Past Chairs

2009 — Francisco Veloso
Carnegie Mellon University
(fveloso@cmu.edu)

2008 — Sebastian Fixson
Babson College
(sfixson@babson.edu)

2007 — Moren Levesque
University of Waterloo
(levesque@uwaterloo.ca)

2006 — Diane Bailey
Stanford University
(debailey@leland.stanford.edu)

2005 - Sarfraz A. Mian
State University of New York, Oswego
(mian@oswego.edu)

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