Sessions for Friday, May 05

**Friday, 08:00 AM - 09:30 AM**

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Title</th>
<th>Chair(s)</th>
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| 073-0858   | Technology Transition in Surgical Care: A Study of Robotic Surgical Procedures | Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States  
Kingshuk Sinha, Professor, University of Minnesota, United States |
| 073-0450   | Multi-Year Model Predicting Patient Satisfaction Based on Wait Times | Quinton Nottingham, Associate Professor, Virginia Polytechnic Institute And State University, United States  
Dana Johnson, Professor, Michigan Technological University, United States  
Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States |
| 073-0525   | Lean and Six Sigma in Healthcare: The Imperfect Arbitrage            | Edward Anderson, Professor, University of Texas Austin, United States     |
| 073-0363   | Team Learning and Process Design in Behavioral Healthcare           | Adrian Choo, Assistant Professor, Michigan State University, United States  
Jamison Kovach, Associate Professor, University of Houston, United States  
Lawrence Fredendall, Professor, Clemson University, United States |
| 073-0628   | Optimal Resource Allocation for Sequential Adaptive Clinical Trials  | Alba Rojas-Cordova, Student, Virginia Polytechnic Institute And State University, United States  
Ebru Bish, Associate Professor, Virginia Polytechnic Institute And State University, United States |
| 073-1522   | Scheduling Endoscopy Patients Under Uncertainty                     | Amy Cohn, Associate Professor, University of Michigan, United States  
Karmel Shehadeh, Student, University of Michigan, United States |
| 073-0947   | A Model of Interplay Between Regulation, Time-to-Market, and Quality in New Drug Development | Vishal Ahuja, Assistant Professor, Cox School of Business, United States  
Canan Savaskan, Associate Professor, Southern Methodist University, United States |
| 073-0809   | How to Manage Congestion due to Compassionate Dialysis: Accept, Reject, Divert? | Olga Boustant, Student, Southern Methodist University, United States  
Silis Celinkaya, Professor, Southern Methodist University, United States  
Vishal Ahuja, Assistant Professor, Cox School of Business, United States |

**Track: Healthcare Operations Management**

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| 073-0363   | Team Learning and Process Design in Behavioral Healthcare           | Adrian Choo, Assistant Professor, Michigan State University, United States  
Jamison Kovach, Associate Professor, University of Houston, United States  
Lawrence Fredendall, Professor, Clemson University, United States |

**Track: Healthcare Scheduling**
A surgeon, who has been allotted blocks of operating-room time, must decide whether to schedule a surgery request in one of the blocks in the earliest planning period, without knowledge of future requests. We model the situation as the online multiple knapsack problem and propose algorithms with provably-good worst-case performance.

073-1277 The Impact of Supply Improvement Processes on Operational Performance: A Case Study
Aisha Abuelmatti, Lecturer, University of Bolton, United Kingdom
Sharin McDowall, Lecturer, University of Bolton, United Kingdom
Fredrick Agboma, Senior Lecturer, University of Bolton, United Kingdom

Non-HMO hospitals must balance flexibility offered to surgeons against financial realities. We consider several ways to increase or decrease flexibility such as partial (vs. full) day surgical blocks and limits on the number of surgeries per block. We evaluate the system-wide impact on resource requirements and financial performance.

073-1645 An Individualized Learning Methodology for the Surgery Scheduling Problem
Amirhossein Meisami, Student, University of Michigan Ann Arbor, United States
Henry Lam, Assistant Professor, University of Michigan, United States
Mark van Oyen, Professor, University of Michigan Ann Arbor, United States

Using a state of the art learning method, we develop an individualized optimization framework to integrate historical data into the optimization of the Appointment Scheduling Problem for planning surgical case allowance times. We show that the method is both theoretically consistent and significantly outperforms current approaches in practice.
This case study aims to identify the impact of supply chain improvement on operational performance from the results of the second largest grocery brand in the United Kingdom. Through regression analysis, this study will present practices that can support companies achieving higher maturity levels in their supply chain.

**073-1680** Vendor Managed Inventory (VMI) as a Collaborative Supply Chain Relationship: A Dependence Perspective

Mehmet Yalcin, Student, University of Rhode Island, United States
Koray Ozpolat, Associate Professor, University of Rhode Island, United States
Dara Schniederjans, Assistant Professor, University of Rhode Island, United States
Asil Oztekin, Assistant Professor, University of Massachusetts - Lowell, United States

Due to its collaborative nature, vendor managed inventory (VMI) implementations need to take into account the relational investment put forth by parties involved in the process and our findings contribute to the collaborative SCM literature by shedding some light on dependence as an important factor affecting relational VMI outcomes.

**073-0065** Dynamics of Buyer and Supplier Coordination in Problem Resolution

Rebecca Clemons, Assistant Professor, Indiana University, United States
Raymond Henry, Associate Professor, Cleveland State University, United States

The dynamics of today’s business require an agile supply chain that effectively resolves problems to remain competitive. We study the supplier complaint process for an automotive supplier. Our research enables management to better understand factors that affect collaboration and the effectiveness of problem resolution within a supply chain.

**073-0167** Joint Pricing-Order Policies for Supply Chain Coordination With Option Contracts Under Price-Sensitive Demand

Benyong Hu, Associate Professor, University of Electronic Science and Technology of China, China
Chao Meng, Lecturer, Marketing and IB, United States

We design an option contract to coordinate a short life-cycle supply chain with price-sensitive demand. Both non-cooperation and cooperation scenarios are considered. We derive the optimal policies for the retailer’s order quantity and quantity price, and the optimal contracts parameters to coordinate the supply chain at the setting of cooperation.

**073-0411** Supply Chain Performance Improvement Through Collaboration: A Reference Framework

Angel Madrid-Rico, Student, Universidad Panamericana Mexico, Mexico
Rodrigo Romero-Silva, Assistant Professor, Universidad Panamericana, Mexico

A solution framework compiling different methodologies and techniques that model cooperation and collaboration through the Supply Chain are presented. Four integration approaches were identified using structured literature review on collaboration, application areas and solutions to critical Supply Chain performance challenges. A real case shows the usefulness of the framework.

**073-1264** A Configuration and Contingency Analysis of Internal and External Integration on Supply Chain Agility

Nallan Suresh, Professor, Sury At Buffalo, United States
Michael Braunischdel, Associate Professor, Canisius College, United States
Soomin Park, Student, Sury At Buffalo, United States

This paper presents empirical results on performance impacts of both sensing and response dimensions of agility, in conjunction with internal and external integration upstream and downstream. It is shown that this expanded view offers new insights on the relationships between integration efforts, agility and operational performance in supply chains.

**073-0302** Sourcing with Capacity Reservation under Uncertain Disruption Risk and Minimum Order Quantity

Jing Hou, Lecturer, Hohai University, China
Amy Zeng, Professor, Worcester Polytechnic Institute, United States

We study a buyer’s capacity reservation contract with a backup supplier when there is uncertainty in the major supplier’s disruption risk and a constraint requiring the buyer to order either none or a minimum quantity in contingent sourcing. We report our findings on the involving players’ optimal decisions.

**073-0324** Pricing and Marketing the Relief Goods

Ting Zhang, Student, University of Science & Technology, China
Linda (Xiaowei) Zhu, Associate Professor, 1979, United States
Qinglong Gou, Associate Professor, University of Science and Technology of China, China

We use Stackelberg game to study the pricing and marketing decision of relief goods in a natural disaster where a manufacturer sells relief goods to the end customers through a retailer. We discuss the impact of forecast and the value of keeping information private on advertising and pricing decision.
Friday, 08:00 AM - 09:30 AM

073-0664 Managing Supply Chain Disruptions: Role of Brokered Access, Asset Specificity and Firm Network Centrality

Saurabh Ambulkar, Assistant Professor, Northeastern University, United States
Gilbert Nyaga, , Northeastern University, United States
Jennifer Blackhurst, Professor, University of Iowa, United States

Supply chain disruptions faced by a firm often start at its supplier. In this study we look at how a firm's dependence on its supplier/s affects the frequency and impact of supply chain disruptions it faces.

073-0716 The Economic Outcomes of Relationship-Based Assets in Buyer-Supplier Relationships: Social Capital or Social Liability?

Yoon Hee Kim, Assistant Professor, Georgia Southern University, United States

Using the panel data of supplier-major customer relationships over 32 years from 1980 to 2011 drawn from Compustat, this study investigates how the relationship-based assets derived from major customer relationships and a supplier's operational capability collectively affect its financial performance.

073-0466 Dependence Perception Alignment in Professional Services Outsourcing Relationships

Jurriaan de Jong, Assistant Professor, SUNY At Buffalo, United States
Sean Handley, Associate Professor, University of Notre Dame, United States
WC Benton, Professor, Ohio State University, United States

In complex professional service outsourcing relationships, factors contributing to inter-organizational dependence can be subject to misinterpretation, potentially causing two exchange partners to perceive relative dependence differently. We investigate how such dependence perception misalignment presents challenges to managing inter-organizational relationships and affect professional service project outcomes.

073-0555 You Are Eligible For An Upgrade: A Critical Look At Hotel Standby Upgrades

Ozalp Ozer, Professor, University of Texas Dallas, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States

Standby upgrades, where guests are only charged if the upgrade is available at the time of arrival, is an innovative practice that has become increasingly popular in the hotel industry. Using a data set from a major hotel chain, we analyze the effectiveness of these upgrades under myopic/strategic guest behavior.

073-1136 Markdown Pricing with Quality Perception and Consumer Optimism: From Experiment to Theory

Rim Hariss, Student, Massachusetts Institute of Technology, United States
Georgia Peraakis, Associate Professor, Massachusetts Institute of Technology, United States
Wichinpong Sinchaisri, Student, The Wharton School, United States
Yanchong Zheng, Assistant Professor, Massachusetts Institute of Technology, United States

We experimentally elicit the relationship between consumers' product perceived quality and the product's price information in a markdown setting. We incorporate the functional relationship into consumers' purchase behavior. We then characterize the firm's optimal policy given consumers' price-based quality perceptions and potential inaccurate expectation of the level of future markdown.

073-1571 A New Method for Managing Inventory in Multi-Product Newsvendor Settings with Customer Choice

Amr Farahat, Assistant Professor, Washington University St Louis, United States
Joonkyum Lee, Assistant Professor, Sogang University, Korea, Republic of (South Korea)

We present a new approach to the multi-product newsvendor problem under a general specification of customer choice behavior. The methodology, rooted in ideas from matrix theory, yields stocking solutions and profit upper bounds that outperform existing benchmarks. Extensions to pricing and display decisions are discussed.

073-0431 Optimal Dynamic Upgrade

Xiao Zhang, Student, University of Texas Dallas, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States
We study a revenue management problem of a firm that sells two products at fixed prices and offers upgrade anytime when necessary between customers’ booking time and check-in time. The optimal policy specifies the timing of the upgrade and the number of customers that the upgrade should be offered to.

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<tr>
<td>Chair(s):</td>
<td>Aditya Jain</td>
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<tr>
<td>Title:</td>
<td>Supply-Chain Innovation Spillover and New Product Introduction</td>
</tr>
<tr>
<td>Authors:</td>
<td>Haiping Hui, Student, The University of Hong Kong, Hong Kong, Hsiao-Hui Lee, University of Hong Kong, China, Po-Hsuan Hsu, Assistant Professor, University of Hong Kong, China</td>
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Empirically we find a casual relationship that supply-chain innovation spillovers improve a supplier’s new product introductions. Longer supply-chain relationships enhance this positive effect. However, the supplier should be cautious if its sales are overly dependent on these major buyers, as the narrowed technology scope may weaken the positive effect.

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<td>Chair(s):</td>
<td>Thomas Friedli, Lukas Budde, Daniel Rohde, Dominik Kohr, Aditya Jain</td>
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<tr>
<td>Title:</td>
<td>State of the Art in Global Complexity Management</td>
</tr>
<tr>
<td>Authors:</td>
<td>Thomas Friedli, Associate Professor, University of St. Gallen, Switzerland, Lukas Budde, Student, University of St. Gallen, Switzerland, Daniel Rohde, Student, University of St. Gallen, Switzerland, Dominik Kohr, Student, University of St. Gallen, Switzerland</td>
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Multinational companies face an enduring increase of internal and external complexity generated by regional customer demands and competitive dynamics. Design rules and coordination mechanisms were established for product portfolios, product architecture and production processes to tackle complexity. Emerging patterns of complexity management in the high-tech industry are identified and discussed.

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<td>Chair(s):</td>
<td>Zhixiang Chen</td>
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<tr>
<td>Title:</td>
<td>Optimization for the Integrated Operations in an Uncertain Construction Supply Chain</td>
</tr>
<tr>
<td>Authors:</td>
<td>Qiurui Liu, Assistant Professor, Huazhong Agricultural University, China, Juqing Xu, Professor, Sichuan University, China, Fei Qin, Assistant Professor, Oakland University, United States</td>
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We introduce the concept of integrated-operations to purchasing and production planning in the Construction Supply Chain (CSC) through a multi-objective uncertain optimization model that is solved by a hybrid genetic fuzzy-random algorithm. When applied to a billion-dollar hydropower construction, this model could save millions of dollars with improved service levels.

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<td>Chair(s):</td>
<td>Dominik Kohr, Lukas Budde, Thomas Friedli</td>
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<tr>
<td>Title:</td>
<td>Market Structure under Endogenous Supply Chain Investment</td>
</tr>
<tr>
<td>Authors:</td>
<td>Aditya Jain, Assistant Professor, Baruch College, United States, Saibal Ray, Professor, McGill University, Canada, Mehmet Gumus, Associate Professor, McGill University, Canada, Juan Camilo Serpa, Assistant Professor, McGill University, Canada</td>
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We consider a model in which retailer and supplier invest to improve supply chains. We show that different market structures result from investment efficacies of the two types of players. We empirically validate our findings.

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<td>Title:</td>
<td>Managing Complexity in Supply Chain Processes</td>
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<tr>
<td>Authors:</td>
<td>Dominik Kohr, Student, Institute of Technology Management, Switzerland, Daniel Rohde, Student, Institute of Technology Management, Switzerland, Lukas Budde, Student, Institute of Technology Management, Switzerland, Thomas Friedli, Associate Professor, Institute of Technology Management, Switzerland</td>
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A linkage of market requirements, product development and production planning is crucial to compete with the increasing complexity due to high volatility and dynamic in customer demands. In our study, we identified managerial issues and successful practices in organizing and coordinating an efficient supply-chain-management from customer requirements to supplier involvement.

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<td>Chair(s):</td>
<td>Qiuping Yu</td>
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<tr>
<td>Title:</td>
<td>Performance Effects of Accounting Restatements in Supply Chains</td>
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<tr>
<td>Authors:</td>
<td>Yating Zhao, Assistant Professor, San Francisco State University, United States, Charles Wang, Associate Professor, SUNY at Buffalo, United States, Feng Gu, Associate Professor, SUNY at Buffalo, United States</td>
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In this study we investigate the performance effects of accounting restatements in dyadic supply chains. Our empirical results reveal that a firm’s accounting restatement significantly affects its supply chain partner’s financial performance.

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<td>Title:</td>
<td>Multi-Objective Decision of Supplier Selection for Sustainable Manufacturing</td>
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<tr>
<td>Authors:</td>
<td>Zhixiang Chen, Professor, Sun Yat-Sen University, China</td>
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This paper studies the decision of supplier selection considering triple-bottom-line of sustainable manufacturing, a fuzzy multi-objective programming model with economic, environmental and social objectives is established. Dynamic weight method and PSO algorithm are applied to solve the model, and numerical example is demonstrated the model application.
Can Consumers Overpay For A Product? The Role of Loss Aversion in Freemium Business
Samii Najafi, Assistant Professor, Santa Clara University, United States
Nishant Mishra, Assistant Professor, Faculty of Business and Economics, Belgium
Andy Tsay, Professor, Santa Clara University, United States
Sajjad Najafi, Hong Kong University of Science & Tech, Hong Kong

We consider a profit-maximizing firm selling two versions of a single product, a free version for free and a premium version at a regular price, to consumers who are loss-averse. We show that when consumers become slightly dissatisfied with the free version, they are more willing to buy the premium.

An Expectation-Maximization Algorithm to Estimate the Parameters of the Markov Chain Choice Model
A. Serdar Simsek, Assistant Professor, University of Texas Dallas, United States
Huseyin Topaloglu, Associate Professor, Cornell University, United States

We develop an expectation-maximization algorithm to estimate the parameters of the Markov chain choice model (MCCM). We prove theoretical convergence guarantees and our computational experiments show that the MCCM, coupled with our expectation-maximization algorithm, can yield better predictions of customer choice behavior when compared with other commonly used alternatives.

Distribution Channel Relationships and Multimarket Competition
Cem Ozturk, Assistant Professor, Georgia Institute of Technology, United States
Necati Tereyaglou, Assistant Professor, Georgia Institute of Technology, United States

We study the role of the distribution channel relationships in determining competitive intensity when manufacturers encounter in multiple markets. Using an extensive scanner data set, we find that cross-market interdependence due to shared ties with the retailers softens competition when manufacturers have asymmetric distribution channel relationships across multiple markets.

Quality Propagation In Supply Chain and Its Implication on Customer Future Purchasing Behavior
Shawn Mankad, Assistant Professor, Cornell University, United States
Masha Shunko, Assistant Professor, University of Washington, United States
Qiuping Yu, Assistant Professor, Indiana University, United States

We integrate transaction data from all stages of the supply chain along with the customer survey and supply chain complaints data from a fast food restaurant chain to understand customer purchasing behavior. Specifically, we focus on how supply chain quality impacts customer experience and thus their life time value.

Online-Retail Inventory Replenishment: A Dynamic Programming Approach
Annie Chen, Student, Massachusetts Institute of Technology, United States
Stephen Graves, Professor, Massachusetts Institute of Technology, United States

We study an online-retail inventory system where fulfilment centers are periodically and jointly reviewed, but each has a deterministic and non-identical replenishment lead time. We formulate the problem as a dynamic program, and apply approximation schemes, including parametrized policies and simulation optimization, to solve it efficiently at scale.

Competitor Price-Matching in Omnichannel Retail
Pavithra Harsha, Research Staff Member, IBM Research, United States
Shiva Subramanian, Research Staff Member, IBM, United States
Joline Lluchanco, Assistant Professor, University of Michigan Ann Arbor, United States

Price-matching is used by many retailers to capture price-sensitive customers. We propose a data-driven method to determine key competitors for a retailer based on the amount of risk. Key competitors may differ by channel and by product category. We demonstrate in experiments on real data from a Fortune 500 retailer.

Inventory Control in an Ecommerce Retail Distribution Network with Multiple Warehouses Serving the Same Customers
John Bowman, Principal Data Scientist, Walmart, United States

We analyze an eCommerce distribution network with multiple warehouses. Any customer can be supplied by any warehouse, but with different delivery costs. Warehouse demands are consequently nonstationary and depend upon inventory policies at other warehouses. We present approximation and simulation-based algorithms for determining inventory policies.

Sales Events with Strategic Customers
Antonio Moreno, Assistant Professor, Northwestern University Kellogg School o, United States
Richard Zhiji Xu, Student, Northwestern University Kellogg School o, United States
Chaithanya Bandi, Assistant Professor, Northwestern University, United States

We study dynamic pricing in the context of online retail in emerging markets, where sales events are frequent and customers are strategic. We study the problem of planning a sale event and allocation of discounts to various categories in a way to control traffic and conversions.

A Set-Partitioning Formulation for Community Healthcare Network Design in Underserved Areas
Marlene Chekeres, Assistant Professor, ESG UQAM, Canada
Marie-Eve Rancourt, Assistant Professor, HEC Montreal, Canada
Karen Smilowitz, Professor, Northwestern University, United States
Friday, 08:00 AM - 09:30 AM

In this presentation, we address issues faced by healthcare supply chains in underserved areas. This problem is inspired by a real-life case study and can be modeled with a set-partitioning formulation. Because of the large number of variables, we propose variable reduction strategies. Computational results are presented for real-life instances.

073-0831 An Agent-Based Model to Define and Detect Systemic Change in Farmer Adoption in Uganda
Megan Peters, Student, George Washington University, United States
Erica Gralla, Assistant Professor, George Washington University, United States
Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
The international development community recognizes that systemic change for inclusive development is a function of scale, impact and sustainability. Donors and practitioners are seeking better ways to measure and evaluate changes. We design an agent based model to study definition of and detection for systemic change, defined as farmer adoption.

073-1052 Designing Emergency Preparedness Networks to Strengthen Local Capacities in the Caribbean, South And Central America
Selene Silvestri, Student, HEC Montreal, Canada
Gilbert Laporte, Professor, HEC Montreal, Canada
Marie-Eve Rancourt, Assistant Professor, HEC Montreal, Canada
The Global Partnership for Emergency Preparedness Project of the United Nations Humanitarian Response Depot (UNHRD) aims to develop partnerships with local governments to create a network of local depots. To support this initiative, this study proposes a mathematical model for pre-positioning planning. The methodological framework and preliminary results are presented.

073-1294 Food Assistance Modality Selection Problem: In Kind, Cash or Voucher?
Feyza Guliz Sahinyazan, Student, McGill University, Canada
Marie-Eve Rancourt, Assistant Professor, HEC Montreal, Canada
Vedat Verter, Professor, McGill University, Canada
There is a vast empirical literature suggesting that providing food aid in cash or vouchers is significantly more effective compared to in-kind. Yet, ours is the first study that mathematically models the aid modality selection and provides a methodology that can respond the dynamics of the environments requiring food assistance.

Friday, 08:00 AM - 09:30 AM, Grand K
Session: Rigor and Relevance: Empirical and Analytical HO Research
Chair(s): Marianne Jahre

073-0144 A Supply Chain Experiment to Improve Food Aid Packaging
Mark Brennan, Student, Student, HEC Montreal, Canada
Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
Prithviraj Sundararaman, Student, Massachusetts Institute of Technology, United States
Daniel Frey, Professor, Massachusetts Institute of Technology, United States
Packaging materials and sizes can greatly impact the cost effectiveness of shipping food aid to meet needs during crisis. We share cost and quality results from an experiment that deployed packaging options in shipments of 500 tons of food aid ($1.7 million) from US suppliers to Djibouti and Durban.

073-0145 Evidence-Based Vehicle Planning for Humanitarian Field Operations
Harwin De Vries, Student, INSEAD, France
Luk Van Wassenhove, Professor, INSEAD, France
This article discusses the applicability and cost-effectiveness of advanced approaches to optimize planning and routing of humanitarian field operations. Combining insights from expert interviews, literature, and extensive numerical analyses, we show how optimal planning system characteristics relate to organizational, demand-related, and operational context factors.

073-1070 Vouchers or In-Kind Aid: A Game Theory Approach to Determine Optimal Aid Transfers
Christos Bitsos, Student, Kuehne Logistics University, Germany
Sandra Transchel, Associate Professor, Kuehne Logistics University, Germany
Maria Besiou, Professor, Kuehne Logistics University, Germany
We aim to determine the conditions for optimal aid transfers in the aftermath of a disaster or during a long-term development program. Considering the strategic interactions between humanitarian organizations and local markets, we develop a framework to contextualize and better consider optimal distribution schemes for humanitarian operations.

073-0317 Contingency Approach to Understanding Challenges in Humanitarian Operations
Joakim Kembro, Assistant Professor, Lund University, Sweden
Marianne Jahre, Professor, BI Norwegian Business School, Norway
Luk Van Wassenhove, Professor, INSEAD, France
Svein Haapnes, Senior Business Analyst, Global Supply Chain, UNHCR, Greece
Extant research describes multiple challenges in humanitarian operations (HO). However, we need more understanding how challenges differ depending on factors such as state of the disaster struck area and the type of operation. Based on an empirical study of three UNHCR large-scale operations we develop a contingency framework for HO-challenges.

Friday, 08:00 AM - 09:30 AM, Regency A
Session: Environmental Impact of Operational Strategies
Chair(s): Gokce Esenduran
073-0010 Comparative Analysis of Economic and Environmental Impacts of Online and Conventional Retailing
Arda Yenipazarli, Assistant Professor, Georgia Southern University, United States
Online shopping is growing fast and claims are made about its positive environmental impact relative to traditional shopping. We study competing retailers that can operate dual channels (bricks and clicks), and examine the implications of the additional Internet outlet for their channel and pricing decisions, and the environment.

**073-0590** Moderating Effect of Absorptive Capacity in the Environmental Uncertainty and Flexibility Relationship
Keontaek Oh, Student, Korea University, Korea, Republic of (South Korea)
Dahee Lee, Student, Korea University, Korea, Republic of (South Korea)
Euibeom Jeong, Student, Korea University, Korea, Republic of (South Korea)
DaeSoo Kim, Professor, Korea University, Korea, Republic of (South Korea)

This study empirically explores the moderating role of absorptive capacity in the effect of environmental uncertainty on flexibility. Absorptive capacity is operationalized as not only organizational capital but also human resources capital. The findings provide significant insights into enhancing flexibility under uncertain environments through absorptive capacity.

**073-0077** Responsible Customers
Brian Jacobs, Associate Professor, Michigan State University, United States
Vinod Singhal, Professor, Georgia Institute of Technology, United States

Responsible sourcing is of increasing research interest. But what happens if your customer is not socially responsible? We examine the impact of the 2015 VW diesel emissions scandal on automotive suppliers.

**073-0113** Does Learning From Inspections Affect Environmental Performance? - Evidence From Unconventional Well Development in Pennsylvania
Vidya Mani, Assistant Professor, Penn State University University Park, United States
Suresh Muthulam, Assistant Professor, Penn State University State College, United States

We investigate how environmental inspections can enable firms to develop organizational knowledge and improve their environmental performance. We use data on 11,039 unconventional wells developed in Pennsylvania, and find that the inspection outcomes and the associated monetary penalties can affect how firms learn to improve their environmental performance.

**073-0267** Strategic Supply Chain Decisions Under Environmental Regulations: When to Invest in End-of-Pipe and Green Technology?
Nazli Turken, Assistant Professor, Cleveland State University, United States
Vedat Verter, Professor, Mcgill University, Canada
Janice Carrillo, Associate Professor, University of Florida, United States

We analyze the effect of different environmental regulations on the market area size and green technology and/or end-of-pipe abatement investment decisions of a company. We identify the scenarios where green technology decisions are separated from market area size and end-of-pipe abatement decisions. We show how local/global emissions are minimized.

**073-1041** Impact Of Carbon Pricing On Improving Supply Chain Energy Efficiency
Jason Quang Nguyen, Student, University of Minnesota, United States
Karen Donohue, Associate Professor, University of Minnesota, United States
Mili Mehrotra, Assistant Professor, University of Minnesota, United States

We study the impact of a carbon pricing policy and its accompany on the energy efficiency investment decisions of a small manufacturing supplier facing competition for the business from a large industrial buyer.

**073-1235** Risk Management Through Investment in Sustainable Solutions
Ali Shantia, Student, HEC Paris, United States
Sam Aflaki, Associate Professor, Hec Paris, France
Hamed Ghodusi, Assistant Professor, Stevens Institute of Technology, United States

We frame investment in Technology Improvement (TI) as a potential risk mitigating mechanism against volatile input prices. The optimal TI decisions are analyzed for both monopolistic and duopoly market structures. We observe that risk mitigating effects of TI investment varies in different market and industry characteristics.

**073-1122** Sustainability in Temporary Multi-Organisations: Green Project Management Cohesion in Oil and Gas Supply Chains
Roula Michaelides, Senior Lecturer, University of Liverpool, United Kingdom
David Bryde, Professor, Liverpool John Moores University, United Kingdom
Christine Unterzihlenberger, Lecturer, Liverpool John Moores University, United Kingdom
Dimitrios Nicolaidou, Associate Professor, University of Teeside, United Kingdom

This paper presents a sustainability-study of oil-and-gas (O&G) developing countries. Overview of sustainability literature has culminated into sustainability-enabling indices which were piloted in Nigerian O&G companies. Adopting an analytic-dualist lens we propose that sustainability cohesion in temporary multi-organisational settings, as O&G supply-chain-projects, entails extending focus beyond economic realms.
We evaluate the prospect where shared mobility of passenger cars prevails throughout urban areas for home delivery services. We develop strategic planning models that characterize drivers’ responses to wages, optimal open-loop routes and service zone design. Then we prescribe several scenarios where this business model is economically and environmentally favorable.

073-1445  New Product Introduction for Durable Goods with Upgraders Segment
            Mahdi Mahmoudzadeh, Student, Georgia Institute of Technology, United States

With shortened introduction cycles for durable goods, manufacturers have increasingly relied on upgraders to expand the market for products' new versions. Upgraders, in upgrading to new versions, behave differently than new buyers. We study how manufacturers adjust their product introduction and operational policies to manage the market with upgraders segment.

073-1405  Truth-Inducing Mechanisms for Medical Surplus Products Allocation
            Can Zhang, Student, Georgia Institute of Technology, United States
            Atlay Alasu, Associate Professor, Georgia Institute of Technology, United States
            Turgay Ayer, Assistant Professor, Georgia Institute of Technology, United States
            Beril Toktay, Professor, Georgia Institute of Technology, United States

We analyze a Medical Surplus Recovery Organization that recovers medical products to fulfill the needs of under-served regions where recipients' utilities are private information. We take a mechanism design approach to elicit recipients' needs information, and show that our proposed mechanism significantly improves total value provision compared with current practice.

073-1133  Quality Management Theory Development via Meta-analysis
            Lu Xu, Student, University of North Texas, United States
            Xianghui (Richard) Peng, Assistant Professor, Eastern Washington University, United States
            Robert Pavur, Professor, University of North Texas, United States
            Victor Prybutok, Professor, University of North Texas, United States

A meta-analysis is conducted on the empirical studies in quality management. The results allow evaluation of relationships among quality management practices as related to performance. This investigation examines how the relationships in the post-2005 period compare with the pre-2005 period. The contingent content factor effects are also examined.

073-1617  An Evolutionary Model of Continuous Improvement Programs: Sustaining Corporate Lean and Six Sigma Initiatives
            Mohan Tatikonda, Professor, Indiana University, United States
            Carrie Queenan, Assistant Professor, University of South Carolina, United States

A nascent framework of continuous improvement (lean, six-sigma and related learning-organization) program sustainment and vibrancy is presented. It is grounded in a two-decade longitudinal case study of a Fortune 200 company's program and analysis of trends in its improvement project portfolio composition (project scale, topics and outcomes) over time.

073-1485  Measuring the Learning Process Through an Empirical Experience in a Logistics Course
            Marcelo Okano, Professor, CEETEPS, Brazil
            Milton de Brito , Professor, CEETEPS, Brazil
            Joao Maellaro, Professor, CEETEPS, Brazil
            Marcos maia, Reader, CEETEPS, Brazil
            Robson Santos, Professor, CEETEPS, Brazil

This experiment was carried out in one of the restaurants of a large American network, where the productive processes are impeccable. We cause an overload of different orders and check the problems caused in production. We applied pre- and post-tests and verified that the students submitted to the activity performed

073-0556  Non-Binding Goals in Teams
            James Fan, Student, Penn State University University Park, United States
            Joaquin Gomez-Minambres, Assistant Professor, Bucknell University, United States

We experimentally investigate the efficacy of non-binding goals for increasing production in teams. We generate hypotheses based on a reference-dependent model of intrinsic utility, and find evidence that well-set goals significantly increase team production.

073-0798  Flexibility in Long-Term Relationships: An Experimental Study
            Kyle Hyndman, Associate Professor, University of Texas Dallas, United States
            Dorothee Honhon, Associate Professor, University of Texas Dallas, United States

We experimentally study behavior in a repeated coordination game in which players are either matched indefinitely (IBA) or free to dissolve the relationship at the end of every period (TBA). We find that while, on average, subjects earn more under IBA, some groups under

073-0739  Trust and Trustworthiness in Risk-Sharing Contracts
            Sina Shokoohy, Student, University of Texas Dallas, United States
            Elena Katok, Professor, University of Texas Dallas, United States
            Anyan Qi, Assistant Professor, University of Texas Dallas, United States

We consider a project under risk-sharing contracts where contractors are not paid until the entire project is completed. We study the impact of trust and trustworthiness on coordination when the contractors report their own progress using game theoretic models and behavioral experiments.
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<tr>
<th>Session</th>
<th>Track</th>
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<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>23</td>
<td>23</td>
<td>JENS BRUNNER</td>
<td>Using Systems Theory &amp; Engineering to Truly See the Big Picture of Healthcare</td>
<td>Brian Galli, Professor, Long Island University, United States</td>
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<td>Healthcare is comprised of stakeholders (healthcare delivery, regulatory agencies, health insurance/health plan organizations, medical device design and manufacturers, pharmaceuticals, society, government, healthcare reform organizations). All stakeholders have varying effects on healthcare. This paper takes a systems approach to integrate the objectives of each stakeholder and their impact on healthcare.</td>
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<td>073-0810</td>
<td>073-0810</td>
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<td>Strategic Investment in Enhancing Port-Hinterland Container Transportation Network Resilience: A Network Game Theory Approach</td>
<td>Hong Chen, Student, School of Management, China, Jasmine Lam, Associate Professor, Nanyang Technological University, Singapore, Nan Liu, Professor, Zhejiang University, China</td>
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<td>The present paper aims to study strategic investment behaviors of players in a port-hinterland container transportation network in enhancing the network resilience to unconventional emergency events. The method of network game theory is adopted to investigate network players’ investment decisions and behaviors connected to their complementary influence in the network.</td>
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<tr>
<td>073-0891</td>
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<td>Supply Chain Performance: The Role of Infrastructure and Public Private Partnerships</td>
<td>Sarah Schafer, Assistant Professor, University of Wisconsin Oshkosh, United States, David Dobrzykowski, Associate Professor, Rutgers University, United States</td>
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<td>Relationships between public private partnerships through intelligent transportation systems and effects on supply chain performance are examined. Hypothesized relationships are tested. Primary data collected from U.S. based freight transportation service providers was integrated with secondary data from the U.S. Department of Transportation’s National ITS Deployment Tracking Survey.</td>
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<td>073-0571</td>
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<td>Improving Operational Capability of the Public Sector, an Operations Strategy Perspective</td>
<td>Rebecca Duray, Professor, University of Colorado Colorado Springs, United States, Monique French, Associate Professor, University of Colorado Colorado Springs, United States, Ying Fan, Assistant Professor, University of Colorado Colorado Springs, United States</td>
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<td>The public sector faces numerous operational challenges given they have different organizational goals from for-profit businesses. This study identifies key strategic choices that help improve operational capability of the public sector. A national level database reported by over 23,000 US fire agencies are used to assess a proposed framework.</td>
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<td>073-0388</td>
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<td>An Extended Framework for Supply Chain Risk Management: Incorporating the Complexities of Next-Generation Medicines</td>
<td>Tomás Harrington, Associate Professor, Cambridge University, United Kingdom, Laird Burns, Assistant Professor, University of Alabama Huntsville, United States</td>
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<td>Emerging therapies, consumer trends, and global regulations are impacting future drug product manufacture and supply. Increased collaboration involving academic, commercial and governmental partners is seen as critical to delivering this vision. Dimensions of supply chain risk are explored in this context, highlighting the complexities and opportunities for next-generation medicines.</td>
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<td>073-0150</td>
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<td>Effects of Innovation Network Topologies on Innovation Network’s Performance: Findings From German Innovation Networks</td>
<td>Aglaya Batz, Student, Brandenburg University of Technology, Germany, Alexandra Rese, Assistant Professor, University of Bayreuth, Germany, Herwig Winkler, Professor, Brandenburg University of Technology, Germany</td>
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<td>Innovation performance from an organization’s perspective refers to its ability to manage the transformation of knowledge into innovation. However, from a network’s perspective it involves structural factors and additional individual organizational abilities. 4062 German innovation networks are examined to elucidate these factors and their correlations influencing the innovation network’s performance.</td>
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<td>073-0100</td>
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<td>Forming Value Networks in Nascent and Emerging Innovation Ecosystems: Healthcare Technology Case Studies</td>
<td>Mark Phillips, Student, University of Cambridge, United Kingdom, Tomás Harrington, Associate Professor, Cambridge University, United Kingdom, Jagjit Singh Srai, Reader, Cambridge University, United Kingdom</td>
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<td>A critical step in the creation and capture of value is the development of the value network. This research explores how firms develop their value networks in nascent or emerging ecosystems, where knowledge and potential partners are distant, using a number of longitudinal case studies from novel healthcare technology innovation.</td>
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073-0691  Strategic Technology Licensing in a Vertical Cooperation Supply Chain  
Qiao Zhang, Student, HEC Montreal, Canada  
Jianxiong Zhang, Professor, Tianjin University, China  
Georges Zaccour, Professor, HEC Montreal, Canada  
Wansheng Tang, Professor, Tianjin University, China  
Consider an outsourcing supply chain where demand uncertainty occurs in Stage 1 due to technology and market uncertainties, whereas it is resolved in Stage 2. The original equipment manufacturer (leader) can license this technology to an external firm to gain revenue. Optimal technology licensing strategy is worth to discuss.

073-0670  The Impact of Online Reviews for Service Competition of Online Retailers  
Vashkar Ghoosh, Student, University of Florida, United States  
Kyung Sung Jung, Lecturer, Warrington College of Business, United States  
Young Kwark, Assistant Professor, ISOM, Warrington College of Business, United States  
Janice Carrillo, Associate Professor, University of Florida, United States  
We develop a game theoretic model in which online retailers compete in their service quality and taste to the consumers’ needs. Online reviews reduce the consumers’ uncertainty and affect the nature of competition and profits of the parties in the channel. We investigate the problem under agency and reselling models.

073-0762  Revenue Model of a Video-Sharing Platform: Advertising-Supported or Subscription-Based  
Xiaoxiao Luo, Student, Tianjin University, China  
Jie Zhang, Associate Professor, University of Texas Arlington, United States  
Minqiang Li,  ,  
A profit-maximizing video-sharing platform can provide either one of two options for viewers: free of charge with watching advertisement and paying subscription for no advertisement. We examine how the video quality, the advertisement version, and the costs of watching video will impact the optimal strategy.

073-1455  More Benefits from the Cloud for Informed Users  
Leila Hosseini, Student, University of Texas Dallas, United States  
Vijay Mookerjee, Professor, University of Texas Dallas, United States  
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States  
Amazon EC2 offers a diverse set of virtual machine instances whose prices are based on their capabilities. We examine a problem how cloud users can find a suitable mix of these instances to satisfy their needs at minimum total cost in the presence of a time constraint.

073-1030  Economic Analysis of Reward Advertising  
Hong Guo, Associate Professor, University of Notre Dame, United States  
Xuying Zhao, Associate Professor, University of Notre Dame, United States  
Lin Hao, Assistant Professor, Mendoza College of Business, United States  
De Liu, Associate Professor, University of Minnesota, United States  
This paper investigates a new advertising model - reward advertising. Under the traditional advertising model, ads are pushed to consumers. In contrast, under the reward advertising model, consumers pull ads and receive rewards. We investigate market conditions under which firms should offer reward ads and their corresponding optimal strategies.

073-0041  Integrated Cross-Dock Scheduling and Assignment  
René De Koster, Professor, Erasmus University Rotterdam, Netherlands  
Arpan Rjial, Student, Erasmus University Rotterdam, Netherlands  
Marco Bijvank, Assistant Professor, University of Calgary, Canada  
Companies use cross-docking to simultaneously minimize transport and inventory holding cost. We study scheduling and dock assignment of inbound and outbound trucks at an LTL cross-dock. Tests on instances based on operations of a Dutch retailer reveal that the integrated model can vastly reduce internal transport and late departures.

073-0086  Supply Planning Problem With Efficient Cross-Docking Operation at an Oil Field Service Company  
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States  
Manoj Vanajakumari, Associate Professor, Texas A&M University College Station, United States  
Haoying Sun, Assistant Professor, Texas A&M University College Station, United States  
Ashley Jones, Global S&OP Manager, ??????, United States  
We consider a supply planning problem via efficient Hybrid Cross-Docking in a B2B setting. We study the structural properties of the problem and provide efficient heuristics for this NP Hard problem. Further, we provide efficient algorithms for a special case of the problem under stochastic demand environment.

073-1496  Tabu Search for the Vehicle Routing Problem with Cross-Docking and Loading Constraints  
Panagiotis Repoussis, Assistant Professor, Stevens Institute of Technology, United States  
Amalia Nikolopoulou, Student, Athens Univ of Econ & Bus, Greece  
Christos Taranitis, Professor, Athens Univ of Econ & Bus, Greece  
We study the problem of a cross-dock under uncertain demands. We propose a hybrid heuristic combining tabu search with a local search procedure.
This work considers the vehicle routing problem with cross-docking, including temporal synchronization for the inbound and outbound flows, loading/capacity constraints and time windows. We develop a local-search based algorithm employing neighborhood structures and memory components to guide the search process. Various computational experiments are reported on benchmark problem instances.

**073-0437** Cross-Dock Terminal Scheduling

Yunxia Zhu, Assistant Professor, Rider University, United States
Neil Geismar, Associate Professor, Texas A&M University College Station, United States
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States
Inna Drobouchevitch, Professor, Korea University, Korea, Republic of (South Korea)

We study various scheduling problems encountered in cross-dock terminals. The typical objective is to minimize the total time spent to perform unloading and loading for a planning horizon. We also study other objective functions under various cross-dock terminal environments (e.g., with no-wait processing and with the presence of temporary storage).

**073-0969** Performance Marketing and Organizational Performance in Jordanian Manufacturing Sector

Ahmed Alamro, Assistant Professor, Qatar University, Qatar

This paper reports the impact of performance marketing on organizational performance in Jordanian manufacturing sector. The importance of study is derived from a scientific correlation between performance marketing and organizational performance, practically, the application of the results to the Jordanian manufacturing sector.

**073-0405** The Interaction Between Government Trade-In and Second-Hand Market

Shu Hu, Student, Southwest Jiatong University, China
Shiliang Cui, Assistant Professor, Georgetown University, United States
Xiang Zhu, Associate Professor, University of Groningen, Netherlands

We analyze the influence of government trade-in and second-hand market as well as their interaction. We find the increasing government subsidy for trade-in can induce consumers' enthusiasm of participating in trade-in. Trade-in is beneficial for retailer and harmful for second-hand firm. However, second-hand market may weaken the benefit of trade-in.

**073-0864** Factors That Influences the Consumer Behavior in Virtual Stores

Paulo Oliveira, Professor, Universidade Anhembi Morumbi, Brazil
Luciano Silva, Associate Professor, Universidade Nove De Julho, Brazil
Maria Teclia, Student, Faculdades Metropolitanas Unidas - FMU, Brazil
Dirceu Silva, Professor, Universidade Nove De Julho, Brazil
Roberta de Barros, Student, FMU - Faculdades Metropolitanas Unidas, Brazil

To achieve the paper objective was developed a research instrument purchased in virtual stores in last 6 months and a factor analyses was used. The factors was named subject norms, convenience, facility, innovation, site, security, control, site classification and payment options and measure a consumer behavior on Internet Stores.

**073-0832** Managing Safety-Related Disruptions: Evidence from US Nuclear Power

Christian Blanco, Student, University of California Los Angeles, United States
Felipe Caro, Associate Professor, University of California Los Angeles, United States
Charles Corbett, Professor, University of California Los Angeles, United States

In this study, we measure the impact of doing Probabilistic Risk Assessment (PRA) on preventing and mitigating safety-related disruptions. We analyze over 25,000 event reports recorded by 101 US nuclear reactors before and after the adoption of PRA.

**073-0850** An Analysis of Time-Based Pricing in Electricity Supply Chains

Baris Ata, Professor, University of Chicago, United States
Asilgul Duran, Student, Northwestern University, United States
Ozge Isilgen, Assistant Professor, Northwestern University Kellogg School of Business, United States

This study builds a framework for the retail electricity market to empirically evaluate the impact of time-based tariffs on the electricity supply chain. We find that time-of-use tariffs with predetermined rates can capture most of the benefits of real-time prices.

**073-0138** Mind the Gap: Coordinating Energy Efficiency and Demand Response

Eric Webb, Student, Indiana University Bloomington, United States
Owen Wu, Associate Professor, Indiana University, United States
Kyle Cattani, Associate Professor, Indiana University, United States

We examine the interactions between energy efficiency investment and demand response participation at industrial firms. We find that policies aiming to close the energy efficiency gap may fail to achieve desired outcomes when firms participate in demand response. We propose a policy to remove the disincentive to install energy efficiency.

**073-1391** Reversing The Death Spiral: A New Business Model for Utility Firms Under Social Network Effects

Gurhan Kok, Professor, Koc University, Turkey
Kevin Shang, Associate Professor, Duke University Durham, United States
Safak Yucel, Assistant Professor, Georgetown University, United States
Dynamic clustering approach to data-driven assortment personalization

A retailer faces heterogeneous customers with unknown preferences. Retailer can personalize assortments using customers’ profiles; however, customers with different profiles may have similar preferences. Thus, the retailer benefits from aggregating information among customers with similar preferences. We propose a dynamic clustering approach that adaptively adjusts customer segments to maximize revenue.
**073-0358** Data-Driven Robust Wait-Time Estimation in the U.S. Kidney Allocation System  
Chithanya Bandi, Assistant Professor, Northwestern University, United States  
Nikolaos Trichakis, Assistant Professor, Massachusetts Institute of Technology, United States  
Phebe Vayanos, Assistant Professor, University of Southern California, United States  
We present a data-driven optimization approach to estimate patient wait-times in the US Kidney Allocation System, based on a novel robust optimization framework, for wait-time estimation in multiclass multiserver queuing systems. We calibrate our model with historical data and illustrate how it can be used to inform medical decision-making.

**073-1299** Learning Preferences with Side-Information: Near Optimal Recovery of Tensors  
Vivek Farias, Associate Professor, Sloan School of Management, United States  
Andrew Li, Student, Operations Research Center, United States  
Many contemporary problems in e-commerce can be cast as large-scale problems of matrix recovery, with side information in the form of additional matrices. We propose a scalable, algorithmic approach based on tensor recovery that enjoys the first near-optimal theoretical guarantee for the problem, and performs well on real-world data.

**073-1054** Data-Driven Assortment Optimization  
Dimitris Bertsimas, Professor, Massachusetts Institute of Technology, United States  
Velibor Mistic, Assistant Professor, University of California Los Angeles, United States  
We present a procedure based on modern linear and mixed-integer optimization for transforming data into assortment decisions, by way of a nonparametric choice model. We provide theoretical results on the tractability of our formulations and demonstrate the effectiveness of our method with real and synthetic data.

**073-0210** Supply Chain Contracts That Prevent Information Leakage  
Yiwei Chen, Assistant Professor, Singapore University of Technology and Design, Singapore  
Ozalp Ozerc, Professor, University of Texas Dallas, United States  
We study a supply chain with one supplier and two competing retailers (incumbent and entrant). The incumbent has better but imprecise private forecast. We identify three groups of contracts that may prevent the supplier from leaking the incumbent's private forecast to the entrant.

**073-0226** Why Markdown as a Pricing Modality? The Role of Threat of Entry  
Elodie Adida, Associate Professor, University of California Riverside, United States  
Ozalp Ozerc, Professor, University of Texas Dallas, United States  
Markdown as a pricing modality is ubiquitous in retail. Despite its practical advantages, everyday-low-price is rarer. We explore whether and why either of these pricing modalities is an effective defense against a firm that enters the market with the alternative pricing modality when consumers are heterogeneous, strategic and regret-prone.

**073-0227** Returns, Rebates and Restocking Fee  
Paolo Roma, Assistant Professor, Universita Degli Studi Di Palermo, Italy  
Rachel Chen, Associate Professor, University of California Davis, United States  
This paper studies the role of rebates and restocking fees in helping deter product returns.

**073-0146** Supply Chain Expansion and Integration  
C. Gizem Korpeoglu, Assistant Professor, University College London, United Kingdom  
Ersin Korpeoglu, Assistant Professor, University College London, United Kingdom  
Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States  
We consider integration of two local supply chains after which suppliers of each supply chain start transacting with retailers of the other. We show that integration increases profit of the integrated supply chain but may reduce profit of a local supply chain with a small ratio of suppliers to retailers.

**073-1548** Distribution Free Approaches for Inventory Control When Orders Cross  
John Saldanha, Assistant Professor, West Virginia University, United States  
Peter Swan, Associate Professor, Penn State Harrisburg, United States  
A systematic literature review motivates the use of new bootstrap procedures and quantile estimator approaches to set inventory control policies when orders cross. The performance of the new and extant approaches is compared when relaxing all assumptions both for the common base stock and the seldom explored continuous review policies.

**073-1281** A Simulation-Optimization Framework to Derive the Inventory Parameters for a Service-Constraint: Multi-Echelon Distribution Network  
Marije Noordhoek, Student, Vrije Universiteit, Netherlands  
Wout Dullaert, Professor, Vrije Universiteit Amsterdam, Netherlands  
Sander De Leeuw, Associate Professor, Vrije Universiteit Amsterdam, Netherlands  
David Lai, Assistant Professor, Vrije Universiteit Amsterdam, Netherlands  
A simulation-optimization framework to optimize (s, S) inventory policies of a multi-echelon distribution network with backordering and fill rate constraints is developed. Different optimization methods are proposed to evaluate and improve supply chain performance for multiple retail case studies.

**073-1097** Optimizing Inventory Targets Using a Data-driven Maximum Coverage Approach
Le Wang, Student, Questrom School of Business, United States
Sean Willems, Professor, University of Tennessee Knoxville, United States

We collaborate with a biotech company to set new inventory targets using historical order and inventory data. We start with identifying the gap between classical inventory models and practice and propose a rather simple but effective heuristic to reduce inventory in the network. Implemented savings exceed one million dollars.

**073-1355** Closing the Gaps: An Online Learning Algorithm for Lost-Sales Inventory System with Lead Times
Huanan Zhang, Student, University of Michigan Ann Arbor, United States
Xiuli Chao, Professor, University of Michigan Ann Arbor, United States
Cong Shi, Assistant Professor, University of Michigan Ann Arbor, United States

We consider a learning problem in a periodic-review inventory system with lost-sales and positive lead times, where the firm does not know the demand distribution a priori, and makes adaptive inventory ordering decisions based only on the past sales data. We developed a learning algorithm with tight square-root regret rate.
073-0963 The Effect of Vertical Integration on Operational Performance: Evaluating Physician Employment in Hospitals
E. David Zepeda, Assistant Professor, Northeastern University, United States
Gilbert Nyaga, Associate Professor, Northeastern University, United States
Gary Young, Professor, Northeastern University, United States

Using data from California hospitals that experienced eligible opportunities to conform to external performance metrics for treating patients in the cardiology operating unit, we empirically evaluated the relationship between physician employment and performance on external conformance quality metrics. We also evaluated whether certain operational conditions moderate the relationship.

073-1651 When Do Advisers Give Bad Advice? Experimental Evidence from Professional Services
Matthew Walsman, Associate Professor, Rutgers Business School, United States
Rohit Verma, Professor, Cornell University, United States

Doctor/patient interactions resemble adviser/client relationships where doctors (advisers) sell advice, while patients (clients) bear the risk of the advice. We investigate (with a behavioral experiment) in a context in which advisers may be influenced to give 'bad' advice. Specifically, we test the impact of client interference on adviser recommendations.

073-1526 Unanticipated Costs: Physician Preference Cards and Teamwork
David Dreyfus, Assistant Professor, Rutgers University, United States
Anand Nair, Professor, Michigan State University, United States
Claudia Rosales, Assistant Professor, Michigan State University, United States

About one-third of over $4B in yearly waste occurring in hospitals takes place in operating rooms. Observations of over 100 procedures reveals the impact of physician preference card planning. The role of the operating room team's communication in curbing unplanned costs is revealed. Empirical analyses will be discussed.

073-1023 Effects of Integration in Healthcare Operations
David Dobrzykowski, Associate Professor, Rutgers University, United States

Hospitals and healthcare systems are implementing various forms of integration in response to external market pressures. However, little is known about the effectiveness of these approaches. This exploratory study examines the effects of differential approaches to integration on key outcome measures relevant under contemporary payment systems.

073-2075 Location Aware Sensory Network for JIT Supply chain networks
Raj Kulkarni, Co-founder/CTO, CloudLeaf Inc, United States

Industry Tutorial, CloudLeaf Inc.: We present the next generation of physical location aware sensory networks, that enables accurate inventories to drive actionable intelligence in JIT supply chain networks for manufacturing.

073-0544 Optimization-Based Scheduling Solution for Hospital Staff
Fei Li, Performance improvement adviser, Hennepin county medical center, United States

We learn the complexity and difficulties in scheduling hospital staff and offer customized optimization-based solutions. Our solution includes a one-stop web-based access to our CPLEX server and a customized scheduling tool for each user. Our solution is easy to develop and spread, thanks to the developments on algorithms and hardware.

073-1628 Improvement on Patient Flows in Surgical Suite with Multiple Operating Rooms
Sangbok Lee, Assistant Professor, ????, Korea, Republic of (South Korea)
Yuehwen Yih, Professor, Purdue University, United States

A strategy to improve patient flows from operating rooms (OR) and post-anesthesia care units (PACU) is presented. Because of the highly uncertain nature of surgeries, congestions between OR and PACU occur frequently. It is shown that deliberate decisions on surgery start-times can reduce these problems.

073-1421 A Method to Predict Day-of-Surgery Case Volume Months in Advance
Joonyup Eun, Research Fellow, Vanderbilt University Medical Center, United States
Vikram Tiwari, Assistant Professor, Vanderbilt University Medical Center, United States
Warren Sandberg, Professor, Vanderbilt University Medical Center, United States

Unused operating room time is an improvable opportunity cost and denies access to potential patients. Deducing a surgical service's daily case volume months in advance would facilitate reallocating unused block time. Starting with information about surgery providers' future availability, we developed dynamic simulation models that accurately predict day-of-surgery service volume.

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Our dynamic interactive dashboards combine disparate data sources to provide real-time clinical and organizational information about the ED. For over 10 years, we’ve analyzed data from 21 hospitals to help professionals better manage the complex patient population and create increased accountability.

**073-0894**  
A Novel Online Method for Analyzing Trial-by-Trial Behavioral Data in Mental Health  
Haomiao Jin, Student, University of Southern California, United States  
Shiniy Wu, Associate Professor, University of Southern California, United States

Recent psychiatric studies use reinforcement learning (RL) to model trial-by-trial behavioral data, since RL parameters can match to some mental functions. We develop a sequential Monte Carlo method for online estimation of RL parameters. Variance reduction through increasing problem dimensions are investigated. Numerical examples are used to demonstrate the method.

**073-1780**  
Analyzing User Interactions Data From a Pediatric Digital Health Education Intervention  
Rema Padman, Professor, Carnegie Mellon University, United States  
Disha Gupta, Student, Carnegie Mellon University, United States

We develop and evaluate clickstream analysis methods to understand pediatric user interactions from playing an iOS/Android based mobile App that has been shown to improve the nutrition-health of children through virtual reality-based immersive mobile gaming using Artificial Intelligence to achieve personalized behavior reinforcement, with implications for pediatric obesity management.

**073-1754**  
Mobile App-Enabled Interventions for Engaging and Empowering Healthcare Consumers: Evidence From a Randomized Field Experiment  
Yi-Chin Kato-Lin, Assistant Professor, Hofstra University, United States  
Rema Padman, Professor, Carnegie Mellon University, United States  
Vibhanshu Abhishek, Assistant Professor, Carnegie Mellon University, United States  
Julie Downs, Associate Professor, Carnegie Mellon University, United States

Mobile technologies have the potential to engage patients and change their decision making, yet little evidence has been documented. We evaluate three mobile-enabled interventions for healthy food choices: heuristic self-monitoring, image-based professional support, and peer support. The results provide strategic insights and may be generalized to other healthy behaviors.
073-0552  Balancing Diagnostic and Resolution Efforts in a Nonprofit Service Delivery Organization
Priyank Arora, Student, Georgia Institute of Technology, United States
Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

This paper studies how a nonprofit organization (NPO), which aims to maximize overall utility delivered to its clients, should balance levels of effort between diagnostic assistance and resolution stages of its service delivery.

073-0820  Understanding Consumers' Choice of Resale Channel for Their Used Products
Gokce Esenuran, Assistant Professor, Ohio State University, United States
James Hill, Associate Professor, Ohio State University, United States
In Joon Noh, Student, Ohio State University, United States

Due to increasing value of used electronics, companies compete in acquiring them from consumers. Consumers can sell them to companies or to other consumers on online platforms. Through a behavioral experiment, we investigate consumers’ choice of resale channels and provide managerial insights to companies to better manage their product acquisition.

073-0073  Dynamic Staffing of Volunteer Gleaning Operations
Baris Ata, Professor, University of Chicago, United States
Deishin Lee, Assistant Professor, Boston College, United States
Erkut Sonmez, Assistant Professor, Boston University, United States

Gleaning refers to collecting food from what is left in the fields after harvest, and donating the goods to food bank or pantries that serve food insecure individuals. In this paper we study a dynamic control problem for volunteer capacity management of gleaning operations.

073-0279  A Supplier Selection and Capacity Allocation Model with Supply Disruption Risk
Dennis Yu, Associate Professor, Clarkson University, United States
Farzad Mahmoodi, Professor, Clarkson University, United States
Alex Ruiz-Torres, Professor, University of Puerto Rico, United States

We consider a buyer's optimal supplier selection and allocation problem. The buyer has the opportunity to reserve flexible capacity when selecting suppliers and allocating order in the first stage. Then, with the flexibility of the reserved capacity the buyer can exercise the flexible capacity when any supplier's supply is disrupted.

073-0507  Minimax Regret Pricing Under Inventory Risk
Chengzhang Li, Student, Purdue University, United States
Mengshi Lu, Assistant Professor, Purdue University, United States

We study the problem of jointly optimizing the price and order quantity of a perishable product to minimize the worst-case regret under ambiguous demand information. We characterize the optimal decisions and study the impact of inventory risk on the optimal price.

073-0427  Random Yield, Financing, and the Optimal Choice of Sourcing Channel
Yalei Fei, Student, University of Science and Technology of China, China

Should the manufacturer purchase from an unreliable supplier with capital constraints or a reliable supplier with adequate capital? We find that a single channel is always the optimal decision even if both channels are available. Loan rate and wholesale prices, and retail price impact the choice of the optimal channel.

073-1045  Robust Knowledge-Based Sourcing Under Dependent Supply Disruption Risks
Justin Jia, Assistant Professor, Purdue University, United States
George Shanthikumar, Professor, Purdue University, United States

We consider a multi-sourcing problem where suppliers are subject to dependent disruptions. The buyer has certain knowledge about the dependence structure (e.g., suppliers' geographical regions) but does not know the exact degree of the dependence. We model the buyer's knowledge and derive structural properties of the sourcing decisions.

073-0166  Supply Chain Disruptions and Advanced Warnings - An Empirical Study of Resiliency Effectiveness
Arash Azadegan, Associate Professor, Rutgers University, United States
Sachin Modi, Professor, Wayne State University, United States

Research indicates that disruptions are detrimental for firm performance. Little is known about the role of disruption warning. We present a framework conceptualizing the effect of warning in large and small disruptions on firm performance, and identify the governing role of supply chain resiliency mechanisms in the warning-performance relationship.

073-0738  Barilla: Contracts with Farmers for Sustainability and Managing Sourcing Risk
Man Mohan Sodhi, Professor, Cass Business School City University Lon, United Kingdom
Marco Formentini, Lecturer, University of Bath, United Kingdom
Christopher Tang, Professor, ucl, United States

This study analyzes the successive generation of supply chain contracts developed and implemented in Italy by Barilla, the leading Italian pasta company, in sourcing durum wheat from farmers in Emilia Romagna Region. These preclude farmers exiting the supply market as well as Barilla not meeting its sustainability requirements.
073-1518  Supply Chain Risk and Cost-Efficient Risk Mitigation Strategies
Michael Westerburg, Student, University of Mannheim, Germany
Christoph Bode, Professor, University of Mannheim, Germany
Firms face the trade-off between ex-post costs from disruptions once they materialize and ex-ante costs from strategies that mitigate the effect of such disruptions. Using archival data, we shed light on the question which risk mitigation strategies provide a cost-efficient means to deal with supply chain risk.

073-0117  Supply Management and Supply Risk
Gokce Esenfundur, Assistant Professor, Ohio State University, United States
John Gray, Associate Professor, Ohio State University, United States
We examine whether, when, and how well-intentioned decisions related to the management of suppliers can inadvertently adversely affect supply risk, both at the firm level and at the industry level. We employ simulation with realistic parameters to illustrate our assertions.

073-0652  A Method for Forecast-Updating for Box-Office
Sangjoon Lee, Student, Korea University, Korea, Republic of (South Korea)
Hojung Shin, Professor, Korea University, Korea, Republic of (South Korea)
Guk-ki Moon, Student, Korea University, Korea, Republic of (South Korea)
While most of the dynamic forecasting models for the box-office focus on the systematic patterns of data, we propose a method of forecast updating using cluster analysis and generalization of A/F ratios. We empirically develop the model using the box-office data of 450 movies obtained from the Korean movie industry.

073-0715  Pricing of Internet Dynamically Under Changing Capacity and Customer Usage
Demet Batur, Assistant Professor, University of Nebraska Lincoln, United States
Jennifer Ryan, Associate Professor, University of Nebraska Lincoln, United States
Zhongyuan Zhao, Student, University of Nebraska Lincoln, United States
Mehmet Vuran, Associate Professor, University of Nebraska Lincoln, United States
Cellular companies nowadays started operating on unlicensed bandwidths like Wi-Fi. This gives cellular companies a stochastically changing Internet capacity. We present a Markov Decision Process model for cellular companies to post dynamically changing prices to its customers based on changing capacity and customer usage with a revenue maximization objective.

073-0794  A Mean-Variance Portfolio Optimization Model for Spot Demand Seat Allocation
Godwin T, Associate Professor, IIM Tiruchirappalli, India
Capacity allocation is an important aspect of revenue management. A mean-variance portfolio optimization based model is proposed to decide on the number of seats to be allocated each to advanced reservation and spot booking. The model analyzes the historical demand data for the two categories and then optimizes the allocation.

073-1081  On the Dependence of Customer Valuation and Service Time
Chenguang Allen Wu, Student, Northwestern University, United States
Achal Bassamboo, Associate Professor, Northwestern University Kellogg School o, United States
Ohad Perry, Assistant Professor, Northwestern University, United States
We consider a service system in which customers' valuations for obtaining service depend on their service requirements. We show that a positive dependence has a negative impact on the revenue of service provider, and demonstrate, via numerical examples, that the revenue loss can be substantial with the dependence ignored.

073-1315  Hotel Revenue Management Optimization Methods: A Comparative Revenue Analysis
Aishajiang Aizezikali, Student, Washington State University Pullman, United States
Victor Pimentel, Assistant Professor, Mr., United States
This paper develops a new optimization approach that does overbooking and allocation simultaneously. We also determine that our method's relative improvement advantage is greatest when demand intensity is lower and the gap in timing between reservation requests and room rates between rate classes is higher.

073-1027  Interactive Teaching with Cases - A Tutorial
Gal Raz, Associate Professor, The University of Western Ontario, Canada
Interactive Teaching and the use of the case method have been shown to provide a great learning experience and pedagogical results. This tutorial will explore the use of the case method in teaching operations management in business school setting. The session will include examples of designing teaching plans for using cases.

073-1145  Delayed Payments in Supply Chains: Moral Hazard vs. Bankruptcy
Sripad Devalkar, Assistant Professor, Indian School of Business, India
Friday, 09:45 AM - 11:15 AM

073-1783 Green Product Strategies Under Competition
Ram Bala, Assistant Professor, Santa Clara University, United States
Sumit Kunnumkal, Assistant Professor, Queens University, Canada
Asoo Vakharia, Professor, University of Florida, United States

Firms incorporate both visible and latent green attributes in their products. The latent attributes have to be communicated to customers through advertising. We show the effectiveness of such advertising under competition for different market contexts.

073-1784 Capacity Investment for Product Upgrades Under Competition
Ram Bala, Assistant Professor, Santa Clara University, United States
Milind Sohoni, Associate Professor, Indian School of Business, India

Firms often introduce a vertical line extension of an existing product to consolidate their market position after loss of monopoly status. We analyze a two stage competitive capacity game between an incumbent and entrant involving uncertainty on the feasibility of the upgrade.

073-0901 Assortment Planning with n-Pack Purchasing Customers
Ying Cao, Student, University of Texas Dallas, United States
Dorothee Honhon, Associate Professor, University of Texas Dallas, United States

We consider a retailer who makes product assortment decisions when facing customers who buy multiple differentiated products in a given product category. We study structural properties of the optimal assortment and explore how the customers’ choice behavior impacts the retailer’s assortment decisions and profits.

073-1635 Online Inventory Disclosure: The Impact of How Consumers Perceive Information
Tolga Aydinliyim, Assistant Professor, Baruch College, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

We study price and location competition between two firms with mass-customization capability. Considering consumers’ taste dispersion and finite reservation prices, we examine the resulting profit and consumer surplus implications. We show that both the firms and consumers may be worse off as a result of mass-customization.

073-0910 The Emergence of a Supply Chain System: The Case of Zaatari Refugee Camp
Ismail Abushaikha, Assistant Professor, German-Jordanian University, Jordan
Zhao Wu, Associate Professor, Oregon State University, United States
Theodore Khoury, Associate Professor, Portland State University, United States

As part of a larger project to understanding the emergence of a social humanitarian system comprising displaced people, governmental and non-governmental actors, various qualitative data was collected within the world’s second largest refugee camp: Jordan’s Zaatari Camp. We describe how a complex and adaptive supply chain system evolves within this context.

073-0902 The Economics of Drop-Shipping
Annila Sodero, Assistant Professor, University of Arkansas, United States

Our investigation is motivated by the increase in drop-shipping transactions at an apparel manufacturer in the United States that also sells through a wholesale channel. We empirically assess inventory allocation and service across channels in a news-vendor-type setting.

073-1101 What If Hotelling's Firms Can Mass Customize?
Ariana Yazdani, Student, University of Oregon, United States
Eren Cel, Assistant Professor, University of Oregon, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

We study price and location competition between two firms with mass-customization capability. Considering consumers’ taste dispersion and finite reservation prices, we examine the resulting profit and consumer surplus implications. We show that both the firms and consumers may be worse off as a result of mass-customization.
Friday, 09:45 AM - 11:15 AM

**Session: Humanitarian Logistics: Bridging Theory and Practice**

**Chair(s): Johanna Amaya Leal**

**073-0516** The Impact of Decentralization and Coordination Policies in Humanitarian Logistics Transportation Networks

Azrah Anparasan, Student, George Washington University, United States

Erina Gralla, Assistant Professor, George Washington University, United States

Humanitarian transportation networks are served by multiple organizations. Parts of the transportation network might be served independently by different decision-makers, who may coordinate with others to varying degrees. This research analyzes the effect of various decentralization and coordination policies on the overall effectiveness of response in humanitarian transportation networks.

**073-1550** Simulating Severe Supply Chain Disruptions with Multiple Suppliers and Firms

Cameron MacKenzie, Assistant Professor, Iowa State University, United States

This presentation discusses a model and simulation of a severe supply chain disruption in which several suppliers suffer from disabled production facilities and firms that purchase goods from those suppliers may suffer a supply shortage. The simulation is applied to a case inspired by the Japanese tsunami.

**073-1140** Ecuador Earthquake Relief Support: Lessons Learned from Fieldwork Research

Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States

Johanna Amaya Leal, Assistant Professor, Iowa State University, United States

Cynthia Perez, Associate Professor, Escuela Superior Politecnica Del Litoral, Ecuador

Trilce Encarnacion, Student, Rensselaer Polytechnic Institute, United States

Diana Ramirez-Rios, Student, Rensselaer Polytechnic Institute, United States

Our study is based on in depth interviews with organizations and individuals involved in the relief efforts that took place after the earthquake in Ecuador and analyses of news media accounts. We present the main lessons learned regarding the disaster response logistics and their implication for future policy improvement.

**073-0808** Motivating Factors of Material Convergence and Willingness to Change: An Empirical Investigation

Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States

Trilce Encarnacion, Student, Rensselaer Polytechnic Institute, United States

Carlos Gonzalez-Calderon, Associate Professor, Universidad Nacional De Colombia, Colombia

Johanna Amaya Leal, Assistant Professor, Iowa State University, United States

Shaligram Pokharel, Associate Professor, Qatar University, Qatar

This research studies the factors that influence material convergence in post-disasters environments, and contributes to the study of donations and donor behavior. Survey data from registered donors is analyzed to gain insight into the perceptions, considerations and beliefs that prompt individuals to donate physical goods.

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Friday, 09:45 AM - 11:15 AM

**Session: Applications in Humanitarian Logistics**

**Chair(s): Jon Stauffer**

**073-0194** Applications of "Optimal" Stockpile Prepositioning

Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States

Jason Acimovic, Assistant Professor, Penn State University State College, United States

Disaster organizations often preposition inventory in order to respond cheaply and quickly to sudden-onset disasters. Organizations lack quantitative guidance that might allow them to balance their own context-specific knowledge with output from math models. We show how optimization-based metrics apply to several organizations' prepositioning strategies.

**073-0731** An Asset Procurement and Operating Policy to Minimize Deprivation Costs

Milad Keshvari Bard, Student, Essec Business School, France

Mahyar Eftekhar, Assistant Professor, Arizona State University Tempe, United States

Felix Papier, Associate Professor, Essec Business School, France

Humanitarian organizations assign a sizable slice of their limited financial resources to procure, operate and maintain operational assets, without which service delivery would be impossible. In this paper, using vehicle as a representative of operational assets, we identify an operational capacity policy in a setting of humanitarian development programs.

**073-0735** Dynamic Allocation of NGO Funds Among Program, Fundraising, and Administration

Telesilla Kotsi, Student, Indiana University Bloomington, United States

Goker Aydin, Professor, Johns Hopkins University, United States

Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States

Non-Governmental Organizations (NGOs) report three types of spending: program spending to deliver services directly to beneficiaries; fundraising spending to raise donations; and administrative spending to build capacity. We study intertemporal trade-offs among these three types of spending. Our findings reveal insightful patterns for NGOs' prioritization of each type of spending.

**073-0096** Global Vehicle Supply Chains in Humanitarian Operations: A Network Analysis Approach

Jon Stauffer, Assistant Professor, Mays Business School, Texas A&M University, United States

Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States
Using the case of 4WD vehicles, we test the assumption that demand for development is independent of disaster demand in humanitarian operations. Combining Exponential Random Graph Model results and simulation, we find that demand for development decreases due to disaster demand. Dependent demand increases the preference for centralized supply chains.

### 073-0433 Environmental Taxes and Green Technology Choice in a Competitive Market

| Arda Yenipazarli, Assistant Professor, Georgia Southern University, United States |

We study important aspects of using environmental taxes to induce the firms' choice of a ""green"" emissions-reducing technology in a duopoly market where customers are heterogeneous in their level of concern about firms' environment footprint.

### 073-0509 Water Pollution Monitoring System: Regulation Policy Guideline for Curbing Nutrient Pollution

| Michael Lim, Associate Professor, University of Illinois Urbana-Champaign, United States |

We examine regulatory guidelines of surface water quality to curb nutrient pollution resulting from various farming activities. We formulate an optimization model that captures the government's regulation decision taking into account farmers' moral hazard issue. We obtain policy insights and guidelines, along with a solution method for the problem.

### 073-0688 Extended Producer Responsibility and Export Bans

| Isil Alev, Assistant Professor, Boston College, United States |

We focus on the export of electronics to developing countries for recycling under EPR-based legislation. To prevent this, the US introduced partial bans that only allow the export of reusable electronics. We show that these bans may lead to exacerbated environmental outcomes as compared to no and full export bans.

### 073-0711 Motivating Supplier Social Responsibility under Incomplete Visibility

| Tim Kraft, Assistant Professor, University of Virginia, United States  
| Leon Valdes, Student, Massachusetts Institute of Technology, United States  
| Yanchong Zheng, Assistant Professor, Massachusetts Institute of Technology, United States |

We study a manufacturer's decisions when the social responsibility performance of his supplier cannot be perfectly observed. The manufacturer can motivate social responsibility by paying a higher price and by investing in the supplier's capabilities. A third party may disclose social responsibility information to consumers, potentially affecting the manufacturer's profits.

### 073-0757 Framing Effect and Anchors in Trade-ins and Upgrades

| Mahdi Mahmoudzadeh, Student, Georgia Institute of Technology, United States |

We study influential anchors on customers' reference-points in trade-ins and upgrades, two seemingly equivalent mechanisms commonly used in replacement offers for durable goods. Understanding the underlying behavioral influences helps us explain manufacturers' nowadays strategies in managing their replacement buyers, which classical models of trade-ins and upgrades are limited in explaining.

### 073-0767 Peer-to-Peer Product Sharing: Implications for Ownership, Usage, and Social Welfare

| Guangwen Kong, Assistant Professor, University of Minnesota, United States  
| Saif Benjaafar, Professor, University of Minnesota, United States  
| Xiang Li, Student, University of Minnesota, United States |

We consider a two-sided market consisting of product owners and renters. Owners are able to generate income from renting their products while non-owners are able to access these products through renting on as needed. We characterize equilibrium outcome and compare product ownership and product usage with and without sharing.

### 073-1510 Managerial Decision Support System for Implementing Sustainable Operations

| Karim Ahmed, Student, Loughborough University, United Kingdom  
| Alok Choudhary, Lecturer, Loughborough University, United Kingdom  
| Grammatoula Papaioannou, Lecturer, Loughborough University, United Kingdom |

An imminent rise in media scrutiny calls for global responsibility in implementing sustainability across organizational supply chains; a complex decision-making process requiring countless foundations, measures and procedures. We present a Decision Support System (DSS) hinged on KPIs from literature and practice; evaluating and guiding supply chain sustainability decision-making.

### 073-0905 Labor Malpractice in Supply Chains

| Sameer Hasija, Assistant Professor, INSEAD, Singapore  
| Hsiao-Hui Lee, , University of Hongkong, China  
| Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore |

Labor malpractices at upstream positions in supply chains impact organizations. From a social/moral perspective poor labor conditions may have long-term adverse effects on society. Lack of visibility in long supply chains hinders our capability in overcoming such issues. We generate empirical insights on the drivers of labor malpractices.
Friday, 09:45 AM - 11:15 AM

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Session: Topics in Returns, Disposition, and Reuse in Consumer Markets  
Track: Closed Loop Supply Chains  
Chair(s): James Abbey

073-0247  How Information Sharing Helps Firms Fight Return Abuse: A Network Perspective  
Serkan Akturk, Student, Texas A&M University College Station, United States  
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States

In this paper, we study a setting where a service provider offers return information exchange (RIE) services that exhibit network externalities for participating retailers and manufacturers. Under different conditions of the network service, we derive equilibrium subscription fees and the sizes of the customer profiling, product tracking, and joint networks.

073-0251  Predicting Return Abuse With Data Analytics  
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States

We apply data analytics to the transactional history of a large national retailer to identify the characteristics of customers who abuse return policies and then utilize this information to develop and test predictive models to help prevent such abuse.

073-0476  Values of Quick Response in a Mass Customization Fashion Supply Chain with Consumer Returns  
SHU GUO, Student, Hong Kong Polytechnic Univ, China  
Tsan-Ming Choi, Professor, Hong Kong Polytechnic Univ, Hong Kong

This study explores a fashion supply chain system, which adopts a mass customization program and allows unconditional consumer returns. It discusses the impacts brought by the quick response strategy. Moreover, the use of incentive alignment contracts in coordinating the mass customization supply chain is also examined. Managerial insights are generated.

073-0246  Perceived Quality Risk in Pricing Remanufactured Products  
James Abbey, Assistant Professor, Texas A&M University College Station, United States  
Rainer Kleber, Assistant Professor, Universitaet Magdeburg, Germany  
Gilvan Souza, Professor, Indiana University Bloomington, United States  
Guido Voigt, Assistant Professor, Universitaet Magdeburg, Germany

This paper addresses the role of perceived quality defects, manifested as both functional and cosmetic defects, when consumers assess their valuation for remanufactured products.

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Session: Processes and Quality 2  
Track: Empirical Research in Operations Management  
Chair(s): Hongyan Dai

073-1102  A Contingency Theory Perspective of Inventory as a Function of Process Types  
Xianghui (Richard) Peng, Assistant Professor, Eastern Washington University, United States  
Hakan Tarakci, Assistant Professor, University of North Texas, United States  
Shailesh Kulkarni, Professor, University of North Texas, United States  
Victor Pybytsuk, Professor, University of North Texas, United States  
Charlie Munson, Professor, Washington State University Pullman, United States

We examined whether inventories have decreased in U.S. manufacturing and whether manufacturing processes have introduced contingent effects on such a decrease. The results show that inventories decrease over years in manufacturing industry sectors and the inventory decreasing rates are statistically different in terms of the manufacturing processes.

073-0068  A Binomial Simulation Approach to More Consistent Analytic Hierarchy Process Matrices  
Phillip Witt, Assistant Professor, University of Nebraska At Omaha, United States  
Marc Evans, Professor, Washington State University Pullman, United States  
Charles Munson, Professor, Washington State University Pullman, United States

In this paper, we develop a new method for simulating AHP matrices assuming responses for the AHP matrices follow binomial distributions. We exhibit the method with a small data sample which we use to estimate the binomial parameters by transformation, and then backwards solving the logit Newton-Raphson updating algorithm.

073-0219  ISO 9000 Internalization Dimensions and Their Effects  
Shaohan Cai, Associate Professor, Carleton University, Canada

We study ISO 9000 internalization by interviewing 47 quality managers. We identify four key processes of ISO 9000 internalization: education, documentation, process improvement, and monitoring. We employ fuzzy set qualitative comparative analysis to identify the combination of the identified processes that facilitate operations performance.

073-0409  The Impacts of Information System Integration on the Efficiency of On-Demand Delivery  
Hongyan Dai, Associate Professor, Central University of Finance and Economics, China  
Ling Ge, Assistant Professor, City University of Hong Kong, Hong Kong  
Yali Liu, Student, Central University of Finance And Economics, China

On-demand services have emerged as a new business model in recent years. In this paper, we aim to examine the factors that may affect the efficiency of on-demand delivery. Especially, we would like to explore how information integration of the ordering platform and the self-scheduled logistic platform affect the efficiency.

073-0477  Predicting Return Abuse With Data Analytics  
Guido Voigt, Assistant Professor, Universitaet Magdeburg, Germany

We apply data analytics to the transactional history of a large national retailer to identify the characteristics of customers who abuse return policies and then utilize this information to develop and test predictive models to help prevent such abuse.

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SHU GUO, Student, Hong Kong Polytechnic Univ, China  
Tsan-Ming Choi, Professor, Hong Kong Polytechnic Univ, Hong Kong

This study explores a fashion supply chain system, which adopts a mass customization program and allows unconditional consumer returns. It discusses the impacts brought by the quick response strategy. Moreover, the use of incentive alignment contracts in coordinating the mass customization supply chain is also examined. Managerial insights are generated.

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James Abbey, Assistant Professor, Texas A&M University College Station, United States  
Rainer Kleber, Assistant Professor, Universitaet Magdeburg, Germany  
Gilvan Souza, Professor, Indiana University Bloomington, United States  
Guido Voigt, Assistant Professor, Universitaet Magdeburg, Germany

This paper addresses the role of perceived quality defects, manifested as both functional and cosmetic defects, when consumers assess their valuation for remanufactured products.
073-1359  Irrational Forecasting Behavior in the Newsvendor Task: Insights from an Eye Tracking Study
Niranjan Tanikere, Assistant Professor, Indian Institute of Technology Bombay, India
Narendra Gohosal, Student, Indian Institute of Technology Bombay, India
Srinagesh Gavirneni, Professor, Cornell University, United States
Jayanth Jayaram, Professor, University of South Carolina, United States

An eye tracking experiment showed that newsvendors have a tendency to forecast demand even when it is normatively inappropriate to do so. We tested strategies to mitigate that bias and improve performance.

073-0603  The Impact of Social Support on Decision Maker's Performance
Sina Zare, Student, University of Texas Arlington, United States

This experimental research investigates the impact of social support on human decision makers' performance. A newsvendor experiment is carried out to support our hypotheses.

073-0413  Experimental Analysis of the Newsvendor Problem with Minimum Order Quantity Contracts
Ozge Tuncel, Student, Singapore University of Technology and Design, Singapore
Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore
Sameer Hasija, Assistant Professor, INSEAD, Singapore

Experiments between human suppliers and automated retailers revealed that the cognitive burden associated with MOQ contract is lower and the profits are higher than with either buyback or revenue-sharing contracts. Moreover, when given a choice, subjects tend to pick the MOQ contract more often, and make quicker and better decisions.

073-0633  Decision Making in Supply Chains - The Roles of Personality, Perceived and Tested Knowledge
Jure Erjavec, Assistant Professor, University of Ljubljana, Slovenia
Nadia Zaheer Khan, Student, National University of Science & Technology Pakistan, Pakistan
Peter Trkman, Associate Professor, University of Ljubljana, Slovenia

We investigate the influence of the five basic dimensions of personality, supply chain knowledge, and time taken to make a decision on the quality of decisions made. One of the more interesting implications is that personality matters more than knowledge. Also, perceived knowledge impacts decision quality more than tested knowledge.

073-0270  A Causal Tree Approach For Personalized Health Care Outcome Analysis
Guilhua Wang, Student, University of Michigan - Ann Arbor, United States
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States
Wallace Hopp, Professor, University of Michigan Ann Arbor, United States

In this study, we provide empirical evidence that quality gaps between hospitals are heterogeneous across subgroups of patients. We then use a causal tree approach to identify subgroups of patients that have large or small quality gaps. Lastly, we show that providing patient-centric information benefits patients, hospitals and payers.

073-0674  Analytical and Empirical Study of Complementarities in an Online Advertising Supply Chain
Anitesh Barua, Professor, McCombs School of Business, United States
Genaro Gutierrez, Associate Professor, McCombs School of Business, United States
Changseung Yoo, Student, McCombs School of Business, United States

We examine channel structures and pricing models in an online advertising supply chain. We develop analytic as well as structural econometric models that enable us to and quantify synergy effects between them. Among other things, we show that using multiple models in concert yields higher overall profitability.

073-1396  Listing Policy Designs in Online B2B Markets
Wenchang Zhang, Student, University of Maryland, United States
Kostas Bimpikis, Assistant Professor, Stanford University, United States
Wedad Elmaghraby, Associate Professor, University of Maryland, United States
Ken Moon, Assistant Professor, University of Pennsylvania, United States

Using a natural experiment, we show that increasing the market thickness has a significant positive effect on final prices. This suggests that the buyer's monitoring cost has a large impact on market entry decisions, which, in turn, affects the seller's revenue. We build structural model to find optimal listing policy.

073-1330  Earnings on Operations Management Issues Through Entrepreneurial Disciplines at Our University
Clovis Galdino, Professor, ESTÁCIO - FNC, Brazil
Hélio Machado, Professor, ESTÁCIO - FNC, Brazil
Jorge Nomura, Professor, ESTÁCIO - FNC, Brazil

Chair(s): Taria Andino Ruiz

Session: Empirical Operations Management
Track: Empirical Research in Operations Management

Chair(s): Ken Moon

Session: Empirical Operations Management
Track: Empirical Research in Operations Management

Chair(s): Ken Moon

Session: Empirical Operations Management
Track: Empirical Research in Operations Management
Friday, 09:45 AM - 11:15 AM

073-1291 Patents, Innovation, and Chinese Technology Policy
Deng zhihong, Associate Professor, Huazhong University of Science and Technology, China

In recent years, economists have begun to carry out systematic research to try to investigate these questions, as well as to shed light on other aspects of Chinese technology policy. In this paper, I summarize very briefly some results that I have obtained in a series of research projects.

073-1992 Research on Innovation Management for the Government to Encourage Innovation
Wenbo Liu, Student, Tongji University, China
Chunyan Duan, Student, University of Washington, China
Chao Lu, Lecturer, Shanghai University, China

The government encourages innovation, which not only needs sophisticated understanding of this word, but also corresponding management methods. Beginning with the theory and practice research of innovation, this article offers specific methods and implementation proposals regarding the encouragement of innovation, which are currently lacking in management methods of the government.

073-1301 Methodology Design for Technology Transfer to Developing Countries: Based on Mektory (TUT)
Taria Andino Ruiz , Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras
Rosa Dubon, Associate Professor, Universidad de San Carlos de Guatemala, Guatemala
Jelena Fornina, Associate Professor, Tallinn University of Technology, Estonia
Cesar Ortega, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras

The valuation of universities and related research and innovation centers as the main technology transfer factories. This study presents a methodology design for technology transfer, understanding how incubation support and innovation strategy can determine the performance of academic- spin offs Based on Tallinn University of Technology experience.

073-0869 Contest Among Contest Organizers
Ervin Korpeoglu, Assistant Professor, University College London, United Kingdom
C. Gizem Korpeoglu, Assistant Professor, University College London, United Kingdom
Isa Hafalir, Associate Professor, Tepper School of Business, United States

We analyze innovation contests wherein multiple organizers post problems to a group of agents, and elicit innovative solutions. We show, interestingly, that a larger number of simultaneous contests may benefit each organizer. We also show that forcing agents to choose a single contest harms organizers when they seek major innovation.

073-1267 On Styles in Product Design: Using Design Patents to Understand Product Evolution
Tian Chan, Assistant Professor, Emory University, United States
Jurgen Mihm, Associate Professor, INSEAD, France
Manuel Sosa, Associate Professor, INSEAD, Singapore

Styles are groupings of product designs of similar form. We showcase a recently introduced database of styles among the more than 350,000 US design patents granted from 1977 through 2010. We discuss how the database can be used to study how styles evolve over time.

073-1318 Designing Internal Innovation Contests
Lakshmi Nittala, Student, University of California San Diego, United States
Vish Krishnan, Professor, University of California San Diego, United States

Firms can use contests to engage employees in finding solutions to its problems related to innovation and product development. We present an analytical model inspired by field work to highlight the unique aspects associated with such internal contests and discuss design recommendations.

073-1605 Creative Idea Generation in the Fuzzy Front End
Laura Kornish, Associate Professor, University of Colorado Boulder, United States

We look at factors that contribute to creative idea generation. Recent research shows that creativity is highest when an idea contains a balance of novel and familiar combinations of its elements. We show that strong associations drive positive ratings, not just of creativity, but also of market appeal.

073-0011 Assessing the Benefits of Complex Event Processing and Predictive Analytics in the Logistics Sector
Cyril Alias, Student, Universitaet Duisburg Essen, Germany
John Franklin, Professor, Kuehne Logistics University, Germany

Complex event processing and predictive analytics can contribute to utilizing increasing amounts of business-relevant data and creating added value. By means of a systematic literature review of the prevalence of the technologies in various areas of the transportation and logistics domain, more than twenty different major benefits have been derived.

073-1099 How Mega Is the Mega? Measuring the Spillover Effects of WeChat by Machine Learning
Jinyang Zheng, Student, University of Washington, United States
Zhengling Qi, Student, University of North Carolina, Chapel Hill, United States
Our work applies a graphical model and econometrics to estimate the spillover effects of WeChat on the other top-50 most frequently used apps in China through data on users' weekly app usage. Our findings show that the spillover effects of WeChat are limited.

**073-1106** Altruism or Shrewd Business? Implications of Technology Openness on Platform Innovations and Competition

He Huang, Professor, Chongqing University, China
Geoffrey Parker, Professor, Dartmouth College, United States
Yinliang Tan, Assistant Professor, Tulane University, United States
Hongyan Xu, Professor, Chongqing University, China

In this paper, we study the incentive of why firms share their proprietary technology with their competitors. In contrast to previous literature focusing on the network effect, our study reveals a novel explanation for why firms are willing to open their technologies.

**073-1779** Dynamic Capacity Allocation and Inventory Control with Transshipment

Satya Malladi, Student, Georgia Tech, United States
Alan Erera, Professor, Georgia Institute of Technology, United States
Chelsea White III, Professor, Georgia Institute of Technology, United States

We address the problem of planning the logistics of a production system with mobile modular manufacturing units simultaneously managing inventory at all the production sites, allowing inventory transshipment. We propose bounds and heuristic methods to analyze the problem and obtain well-performing solutions.

**073-1831** Optimal Adaptive Bidding Strategy for Electricity Market Participants Considering Renewable Generation and Price Uncertainties

Kai Pan, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong
Yongpei Guan, Professor, University of Florida, United States

An optimal adaptive bidding strategy is derived for independent power producers by attending both day-ahead and real-time markets as price taker, and is theoretically justified of its significant advantages over existing alternative ones. The numerical studies show the promising future and verify the effectiveness of the proposed cutting plane.

**073-1781** Scheduling Energy Resources in an Electricity Market Environment: A Grid Operator Perspective

Kwok Cheung, Director, Global Market Management Solutions, General Electric, United States

This paper discusses the challenges of scheduling energy resources in an electricity market environment. As distributed generation, demand response and renewable energy resources become significant portions of overall system installed capacity of power systems, new sets of system dispatch and scheduling tools are needed in modern system control centers.

**073-1912** Strong Formulations for the Integrated Minimum-Up/Down Time and Ramp Polytope

Kai Pan, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong
Yongpei Guan, Professor, University of Florida, United States

We study the polyhedral structure of an integrated minimum-up/down time and ramp polytope, which has broad applications in variant industries. The polytope we studied includes minimum-up/down time, generation ramp-up/down rate, logical, and generation upper/lower bound constraints. We derive strong valid inequalities and convex hull results. Computational results are promising.

**073-1582** Channel Versus Retailer Loyalty When a Product is Out-of-Stock

Daniel Taylor, Student, Ohio State University, United States
Elliot Bendoly, Professor, Ohio State University, United States
A. Kneuemey, Associate Professor, Ohio State University, United States
Keely Croxton, Associate Professor, Ohio State University, United States

As companies move to omnichannel strategies they are experiencing both competition and synergy among marketing and distribution channels. By examining hassle cost, this research experimentally demonstrates that online consumers are more loyal to the shopping channel than the retailer when compared to in-store consumers.

**073-1239** The Impact of Category Captainship on Retail Competition

Alper Nakkas, Associate Professor, Universidade Nova De Lisboa, Portugal
Mumin Kurtulus, Associate Professor, Vanderbilt University, United States

Retailers collaborate with one leading manufacturer (i.e., captain) to improve their marketing and operational decisions, a practice often called category captainship. We show that a retailer implementing captainship can benefit from it but also identify situations where the retailer can be worse off because of information leakages to competing retailers.

**073-0419** Channel Deliberation in a Decentralized Channel

Xi Li, Student, University of Toronto, Canada
Yanzhi Li, Associate Professor, City University of Hong Kong, Hong Kong
Mengze Shi, Associate Professor, University of Toronto, Canada

Consumers have to incur deliberation costs in learning about their valuations for a new product. We explore the equilibrium decisions of players in a two-tier supply chain and investigate the effects of deliberation cost on channel decisions and efficiency.
Is Electricity Storage Green? A Study on Commercial Buildings
Yangfang Zhou, Assistant Professor, Singapore Management University, Singapore

Electricity storage facilities, such as industrial batteries, are considered the "holy grail" in decarbonizing the electrical grid. We model the problem of managing electricity storage in a commercial building both with and without solar panels. Using models calibrated to data, we study the impact of storage operation on carbon emission.

Wind Generation Strategic Bidding in a Competitive Electricity Market
Ali Shantia, Student, HEC Paris, United States
Owen Wu, Associate Professor, Indiana University, United States
Roman Kapucinski, Professor, University of Michigan Ann Arbor, United States

We empirically study how strategic behaviour of renewable generators translates to their higher profitability. Using the day-ahead and real-time market data, provided by Midcontinent Independent System Operator (MISO), we study what differentiates the bidding behaviour of wind generators. We also analyze whether such strategic behaviours practically increase wind generation profitability.

Limitations of Non-Tiered Linear Tariff Structures in Regulating Electricity Markets with Rooftop Solar
Siddharth Prakash Singh, Student, Carnegie Mellon University, United States
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

Increased penetration of rooftop solar has led to decreased utility company profitability and undesirable cross-subsidization among customers. Regulatory responses have been controversial: changes in Nevada induced SolarCity, the market leader in solar panels, to suspend local operations. We demonstrate that choosing the right tariff structure is crucial to fair regulation.

Strategic Commitment to a Production Schedule: Renewable Energy in Day-Ahead Electricity Markets
Nur Sunar, Assistant Professor, Kenan-Flagler Business School, United States
John Birge, Professor, Booth School of Business, United States

We consider a day-ahead electricity market that consists of multiple competing renewable and conventional firms in a discrete-time setting. We prove that in equilibrium, imposing or increasing a market-based undersupply penalty rate in a period can result in lower equilibrium reliability in all periods with probability 1.

Adblockers, Advertisers & the Internet - The Economic Implications of AdBlocking
Abhishek Ray, Student, Purdue University, United States
Hossein Ghasemkhani, Assistant Professor, Purdue University, United States
Karthik Kannan, Professor, Purdue University, United States

We study the rise of ad-blockers in the online ecosystem. We analytically investigate impact of ad-blockers as a competing platform to ad-exchanges. Using a model of competing multi-sided platforms, we identify key impacts on network externalities to users, publishers and advertisers. In addition, we explore pricing mechanisms in such settings.

Impact of Location Based Games on Local Businesses: A Study of Pokemon Go on Restaurants
Vandith Pamuru, Student, Krannert School of Management, United States
Warut Khern-am-nuai, Assistant Professor, McGill University, Canada

This research studies the impact of Pokemon Go, an Augmented Reality based game that requires the player to move to pre-selected physical locations, on the restaurants that are close to these locations. The game is shown to have effect on the online quality perception of the restaurants.

When Do Givers Take and Takers Give? Reciprocity Styles and Student Interaction On MOOCs
Aravinda Garimella, Student, University of Washington, United States
Ming Fan, Professor, University of Washington, United States

MOOCs are platforms of collaborative learning that heavily rely on student interaction. We show that students are heterogeneous in their reciprocity styles and that these styles have important effects on the nature of their interaction. Our analysis is conducted on three years of interaction data between students on Khan Academy.

Optimal Award Scheme in Innovation Tournaments
Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States
Ersin Korpeoglu, Assistant Professor, University College London, United Kingdom
Laurence Ales, Assistant Professor, Carnegie Mellon University, United States

In an innovation tournament, an organizer seeks innovative solutions to a problem from multiple agents. We characterize when a winner-take-all award scheme is optimal, and show that the organizer should offer a larger winner award when seeking many good solutions, but not necessarily when anticipating more participants to a tournament.

Sourcing Innovative Products: Integrated Module or Individual Component
Zhi Chen, Student, INSEAD, Singapore
Many purchasing projects require the suppliers to perform some custom product or technology development regardless of whether they win the project or not. In this paper we use such a contest setting to study under which circumstances a principal should source a set of components as a system or individually.

073-0550  The Role of Feedback in Dynamic Crowdsourcing Contests: A Structural Empirical Analysis
Zoeyi Jiang, Student, University of Michigan, United States
Yan Huang, Assistant Professor, University of Michigan, United States
Damian Beil, Associate Professor, University of Michigan, United States

We empirically examine the impact of feedback on the outcome of crowdsourcing contests. Using a dataset from a crowdsourcing platform, we develop and estimate a dynamic structural model to understand contestants’ behavior, compare alternative feedback policies using counter-factual simulations, and find providing feedback throughout the contest may not be optimal.

073-1004  Better Late Than Now: Delayed vs. Instantaneous Price Discounts with Repeat Customers
Monire Jallal, Student, University of Oregon, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

Sellers usually offer a “percent off” a purchase and apply it either “immediately” or “delay” it toward future purchases. We prove that despite the consumer rationality, delayed discounts is optimal in a heterogeneous market provided the existence of 1) time discounting and 2) spending or price fluctuation.

073-1260  Optimal Pricing and Inventory Decisions for a Portfolio of Trade-in Programs
Mohammad Ghuloum, Assistant Professor, Kuwait University, Kuwait

Trade-in programs are capital intensive, so trade-in managers need not only to balance the acquisitions with sales, but also to manage the inventory of a portfolio of products. We analyze a multi-product dynamic pricing problem where the supply and demand depend on the dynamic acquisition and selling prices, respectively.

073-0532  Optimal Spending for a Search Funnel
Shengqi Ye, Assistant Professor, University of Texas Dallas, United States
Goker Aydin, Professor, Johns Hopkins University, United States
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States

Accordingly, a firm’s “search funnel” is a network of keywords, which become more specifically tied to the firm as customers progress through the network before making their purchase. In this paper, we study a firm’s optimal spending on keywords across the search funnel, given a limited budget for search advertising.

073-0605  Inventory Control In The Presence Of Social Learning
Guangwen Kong, Assistant Professor, University of Minnesota, United States
Ankur Mani, Assistant Professor, University of Minnesota, United States
Yuanchen Su, Student, University of Minnesota, United States

We consider an inventory problem where customers in a social network facing the purchasing decision of differentiated products. We study how the preferences of informed customers and the network structure influences the uninformed customer’s decision and thus have an impact on the firm’s inventory decision.

073-1573  Managing Innovation Spillover Risk in Sourcing
Bin Hu, Assistant Professor, Kenan-Flagler Business School, United States
Yunke Mai, Student, Fuqua School of Business, United States
Sasa Pekec, Associate Professor, Fuqua School of Business, United States

We study strategic decisions of an innovator and a competitor-supplier in the presence of innovation spillover risks. The value of innovation is uncertain, and depends on the market acceptance of new product features or the innovative concept. We characterize equilibrium decisions of both firms and analyze managerial implications.

073-0186  The Value of Strategic Farmers, Social Entrepreneurs and For-Profit Firms in Crop Planting Decisions
Ming Hu, Associate Professor, University of Toronto, Canada
Yan Liu, Assistant Professor, Tianjin University, China
Wenbin Wang, Associate Professor, Shanghai Univ. of Finance and Economics, China

We study how farmers make crop-planting decisions over time to maximize incomes. We find a tiny fraction of strategic farmers may be enough to stabilize the market price. An optimally-designed pre-season procurement contract, offered by a social entrepreneur or for-profit firm brings benefit to farmers as well as the firm.

073-1104  Infinite Horizon Optimal Policy for Deploying New Servers in a Cloud Computing Company
Mohammad Arbabian, Student, University of Washington, United States
Shi Chen, Assistant Professor, University of Washington, United States
We study the problem of deploying new servers in a cloud company. We consider a continuous review system and present its optimal policy which minimizes the total discounted cost in an infinite horizon setting. Moreover, the optimal server specifications to be ordered each cycle given the current servers are derived.

073-1616 Serial Inventory Systems with Markov-Modulated Demand: Derivative Bounds, Asymptotic Analysis, and Insights
Li Chen, Associate Professor, Cornell University, United States
Jing-Sheng Song, Professor, Duke University Durham, United States
Yue Zhang, Student, Duke University Durham, United States
We study serial inventory systems with continuous, Markov-modulated demand (MMD). We develop general, analytical solution bounds and heuristics for the optimal policy. We show that the relative errors between our heuristic and the optimal solutions converge to zero as the lead time becomes sufficiently long.

073-1662 Real-Time Dynamic Pricing for Revenue Management with Reusable Resources and Deterministic Service Time Requirements
Yanzhe (Murray) Lei, Student, Ross School of Business, United States
Stefanus Jasin, Assistant Professor, Ross School of Business, United States
We study a dynamic pricing problem where a firm faces price-sensitive customers arriving stochastically over time. Each customer consumes one unit of resource for a deterministic amount of time, after which the resource can be immediately used to serve new customers. We develop two heuristics that have asymptotically optimal performances.

073-1860 Cloud Pricing and Capacity Management: Utilization-Based vs. Reservation-Based Incentive Schemes
Shi Chen, Assistant Professor, University of Washington, United States
Hau Lee, Professor, Stanford University, United States
Kamran Moinzadeh, Professor, University of Washington, United States
This study is inspired by the pricing and capacity management practices adopted by public cloud providers. We develop a model to analyze two competing providers facing customers who have different usage patterns of the cloud resources. One offers compute capacity reservation, while the other offers sustained-usage-based incentive schemes.
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<th>Session</th>
<th>Title</th>
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<tr>
<td>073-1067</td>
<td>Enabling Surgical Care Delivery with a Robot: A Longitudinal Field Study</td>
<td>Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States; Kingshuk Sinha, Professor, University of Minnesota, United States</td>
<td>In this paper, we conduct a longitudinal field study on (da Vinci) robot-assisted surgery at a multi-specialty hospital that investigates into (i) the outcome variation across surgeons performing a surgical procedure, and (ii) surgeon and surgical team learning.</td>
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<td>073-1240</td>
<td>Evaluating The Implementation Effectiveness of CDS Systems: The Role Of Health Care Provider Capability</td>
<td>Xiaojin Liu, Student, University of Virginia, United States; Susan Goldstein, Associate Professor, University of Minnesota, United States; Karen Soderberg, Assessment and Evaluation Coordinator, Minnesota Department of Health, United States; Kingshuk Sinha, Professor, University of Minnesota, United States</td>
<td>We investigate enablers and barriers to developing the capabilities of health care providers to use Clinical Decision Support (CDS) systems to deliver high quality and cost effective care. We empirically test an integrative framework on the interplay between the capability of physicians and nurses, CDS, and health care delivery effectiveness.</td>
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<td>073-0323</td>
<td>Technology, Cost and Healthcare Policy - What Do New Yorkers Think?</td>
<td>Lu Kong, Student, Cornell University, United States; Hessim Sadatsafavi, Student, Cornell University, United States; Rohit Verma, Professor, Cornell University, United States</td>
<td>This study presents results of the Empire State (New York) survey which was conducted to understand customers' perceptions of important issues in current healthcare system (such as cost and policy); impact of physician computer use on healthcare quality; and preferred setting (hospital, clinic, and mobile-health) for routine care.</td>
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<td>073-1437</td>
<td>Health IT-Leveraging Capability for Patient-Centered Primary Care: Moderation and Mediation Effects on Patient Satisfaction</td>
<td>E. David Zepeda, Assistant Professor, Northeastern University, United States; Yang Lee, Associate Professor, Northeastern University, United States</td>
<td>This study examines how health IT-leveraging capability impacts patient experience outcomes, a key factor for patient-centered care. Using a unique dataset compiled from the largest U.S. statewide survey on outpatient experience, we developed and empirically tested a framework for investigating the interplay between the key aspects of patient-centered primary care.</td>
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<td>073-0680</td>
<td>When Should Firms Invest In Prosthetics Made With Additive Manufacturing Technology?</td>
<td>Arunima Chhikara, Student, University of Florida, United States; Arda Yenipazarli, Assistant Professor, Georgia Southern University, United States; Asoo Vakharia, Professor, University of Florida, United States</td>
<td>Recently there's been a surge of 3D printed prosthetics by non-profit organizations. We model the investment decision of a commercial firm in entering 3D printed prosthetics industry. We also consider competition between a traditional and the additive firm and the environmental impact of the prosthetics made with additive technology.</td>
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<td>073-0697</td>
<td>Hospital Quality, Medical Charge Variation, and Patient Care Efficiency: Implications for Bundled Payment Reform Models</td>
<td>Seokjung Youn, Student, Texas A&amp;M University College Station, United States; Gregory Heim, Associate Professor, Texas A&amp;M University College Station, United States; Subodha Kumar, Professor, Texas A&amp;M University College Station, United States; Chelliah Sriskandarajah, Professor, Texas A&amp;M University College Station, United States</td>
<td>We examine how unwarranted variation in medical charges relates to patient-centric goals. From a policy-maker's viewpoint, the results imply that managerial incentives based on process-quality (rather than outcome-quality) may better improve operational behaviors that lead to lower variation and higher efficiency. We investigate these implications for bundled payment programs.</td>
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<td>073-1935</td>
<td>An Empirical Investigation of Doctor Responses to Online Health Queries</td>
<td>Sandeep Khurana, Student, Indian School of Business, India; Liangfei Qiu, Assistant Professor, University of Florida, United States; Subodha Kumar, Professor, Texas A&amp;M University College Station, United States</td>
<td>In this study, we investigate the impact of doctor responses on patient recommendations. In particular, we examine the spillover effect of doctor responses on other nearby doctors' patient recommendations.</td>
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<td>073-1955</td>
<td>Analyzing the Impact of Surgical Process Changes on Patient Flow: Evidence From Field Research</td>
<td>Justin Kistler, Student, University of South Carolina, United States; Ram Janakiraman, Associate Professor, Univ of South Carolina, United States; Vikram Tiwari, Assistant Professor, Vanderbilt University, United States; Subodha Kumar, Professor, Texas A&amp;M University College Station, United States</td>
<td>Leveraging unique patient level encounter data through econometric techniques, we examine the impact of two process changes on surgical operations at a medical center. Building on management and operations literature, we posit that a process change, and a subsequent intra-operative IT enabled process change, will significantly improve surgical operations flow.</td>
</tr>
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073-1188 Sustainability Planning for Healthcare Information Exchanges
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States
Arun Sen, Professor, Texas A&M University College Station, United States
Vahid Sarhangian, Student, Sloan School of Management, United States
Kalyan Pasupathy, Associate Professor, Mayo Clinic, United States
Mustafa Sir, Assistant Professor of Healthcare Systems Engineering, Mayo Clinic, United States

The HIEs facilitate the electronic transfer of health information among healthcare organizations. The financial sustainability is still a key challenge for many HIEs. The focus of our work is to understand the operational decisions of an HIE, and provide insights on making rational decisions to ensure its long term sustainability.

073-1290 Dynamic Server Allocation in a Multiclass Queueing System With Shifts: Nurse Staffing in Emergency Departments
Carri Chan, Associate Professor, Columbia Business School, United States
Vahid Sarhangian, Student, Columbia Business School, United States

We consider the potential benefits of dynamically assigning nurses to different areas within an ED at the beginning of each shift by considering a multiclass queueing model of the system. We find this additional flexibility can substantially reduce waiting times for patients.

073-1584 Introducing Swing Shifts to Dynamically Respond to Emergency Department Workload Uncertainty
David Kaufman, Assistant Professor, University of Michigan-Dearborn, United States
Kalyan Pasupathy, Associate Professor, Mayo Clinic, United States
Mustafa Sir, Assistant Professor of Healthcare Systems Engineering, Mayo Clinic, United States

Emergency department workload is uncertain. In response, Mayo Clinic recently introduced a "swing shift," which allows physicians to sometimes leave early. While popular, swing shifts introduce several operational challenges. We develop a data-driven solution - a tractable optimization model that is deterministic, even though the problem is complex and stochastic.

073-1585 Operational Considerations for Not-So-Quick Recovery Procedural Patients
Bethany Daily, Senior Administrative Director, Perioperative Services, Massachusetts General Hospital, United States
Peter Dunn, Executive Medical Director, Massachusetts General Hospital, United States
Retsef Levi, Professor, Massachusetts Institute of Technology, United States
Kfir Yeshayahu, Student, Massachusetts Institute of Technology, United States
Ana Cecilia Zenteno Langle, Operations Research Manager, Massachusetts General Hospital, United States

Technological advances have given rise to less-invasive procedures with faster recovery times. As case volume increases, hospitals have to design appropriate post-procedure care processes while adapting to new compensation schemes. We describe how the lack of transparent scheduling guidelines can result in suboptimal recovery pathways and longer lengths of stay.

073-1488 Online Scheduling Algorithms for Infusion Outpatients
Kimia Ghobadi, Student, Sloan School of Management, United States
Michael Hu, Student, Massachusetts Institute of Technology, United States
Retsef Levi, Professor, Massachusetts Institute of Technology, United States
Adam Marshall, Student, Massachusetts Institute of Technology, United States
Ana Cecilia Zenteno Langle, Operations Research Manager, Massachusetts General Hospital, United States
Inga Lennes, .

We developed online intra- and inter-day algorithms to schedule infusion appointments for outpatients. Each appointment is scheduled without prior knowledge of future appointments with the goal of minimizing the number of required resources. We analyze the algorithms’ performance and our results show 45% decrease compared with historical resource utilization.

073-1577 CSR and Home Country: Effects on the Multinationality
Vinicius Nardi, Student, Unisinos University, Brazil
Iuri Gavronsks, Assistant Professor, UNISINOS, Brazil

The paper objective is to relate the level of multinationality of the firm to their socially responsible operations (SRO) and the environmental development of their home country. We analyzed a sample of 82 firms using archival data from the UN and GRI. We found support for our hypotheses.

073-0325 Social Responsibility Through Social Media: Financial and Operational Impacts
Qing Cao, Professor, University of Houston Downtown, United States
Vicky Gu, Assistant Professor, University of Houston Clear Lake, United States
Dara Schniederjans, Assistant Professor, University of Rhode Island, United States
Marc Schniederjans, Professor, University of Nebraska Lincoln, United States

This study addresses the impact of social responsibility on abnormal-returns and idiosyncratic-risk. Analyzing a large data base of social media data, results of a fixed effects model is compared between 1, 2 and 3-day lags. Economic and environment are significantly associated with the financial dependent variables.

073-1890 Optimal Allocation Rules With Waste Consideration
Sara Rezaee Vessal, Student, Hec Paris, France
Sam Aflaki, Associate Professor, Hec Paris, France
We study capacity allocation of a scarce and perishable product among stockout averse retailers that face stochastic demand. We focus on two commonly practiced allocation mechanisms and using a dynamic model characterize the conditions under which each allocation mechanism performs superior from a waste and profit point of view.

**Session: Risk Management in Supply Chains**

**Chair(s):** Jiho Yoon

**Track:** Supply Chain Management

**073-2024** The Impact of Inter-Firm Learning on Supplier Management in the Context of Supply Chain Security

Guanyi Lu, Assistant Professor, Oregon State University, United States

Xenophon Koufteros, Professor, Texas A&M University College Station, United States

Aleda Roth, Professor, Clemson University, United States

This study examines the effect of inter-firm learning on the implementation of security-oriented supplier management practices and firm performance across several dimensions. Our study adds value to the literature on SSC practices and provides a pragmatic way for firms to attain gains from their supply chain security efforts.

**073-2043** Supplier Risk Perception of Buyer Opportunism: TCE or Shadow of the Future?

Jie Chen, Professor, ?????, United Kingdom

Xande Zhao, Professor, China Europe International Business School, China

Applying a scenario-based experiment, we examine supplier risk perception of buyer opportunism in association with supply chain dependence following two competing logics: transaction cost economics (TCE) and the ‘shadow of the future’. The results indicate that the second logic dominates the perception but at the same time interplays with TCE.

**073-2044** The Impacts of IT and Marketing Capabilities on Supply Chain Integration: A Resource-based Perspective

Wantao Yu, Professor, ????, United Kingdom

Mark Jacobs, Assistant Professor, University of Dayton, United States

Roberto Chavez, Professor, ????, Chile

Mengying Feng, Professor, ????, China

Based on survey data from 329 Chinese manufacturing firms, our study investigates the direct and interactive effects of IT capability and marketing capability on supply chain integration (SCI). IT capability and marketing capability have a significant positive effect on SCI, while no significant interaction effect was found.

**073-2026** Models for Supplier Selection and Risk Mitigation: A Holistic Approach

Jiho Yoon, Assistant Professor, Kansas State University, United States

Sri Talluri, , Michigan State University, United States

Hakan Yildiz, Assistant Professor, Michigan State University, United States

William Ho, Senior Lecturer, University of Melbourne, Australia

With growing emphasis on supply risk, consideration of risk in supplier selection is an important issue faced by firms. We utilize multi-objective optimization based simulation in building a decision model for this problem setting. We consider data from an automotive parts manufacturer in demonstrating the application of our approach.

**Session: Supply Chain Inventory**

**Chair(s):** Patricia Cardoso

**Track:** Supply Chain Management

**073-0084** Optimum Arrangement of Inventory Policies Across Echelons of a Supply Chain

Venkata Vijay Kumar Pasupuleti, Lecturer, IIRM Hyderabad, India

Model is built to study the impact of demand variance on the supply chain inventory. Model simulates on four echelon supply chain. Demand varying from 10% to 70%, the best combination inventory policies resulted inventory variance from 11.5% to 18.9% respectively. inventory policies varies between high and low demand variance.

**073-0872** Strategic Introduction of Marketplace under Dual Asymmetries of Market Information and Sales Efficiency

Yingchen Yan, Student, Tianjin University, China

Ruqing Zheng, Professor, Tianjin University, China

Recently, online platforms start allowing manufacturers direct access to their customers while charging a fee, a format commonly referred to as marketplace. We find that introduction of marketplace may be a triple-win strategy for the manufacturer, platform and consumers, in the presence of asymmetries of market information and sales efficiency.

**073-1627** Strategic Inventory and Channel Choices

Chinmoy Mohapatra, Student, University of Texas Austin, United States

Abhishek Roy, Student, McCombs School of Business, United States

Strategic inventory is known to affect both the supplier and the buyer in a vertical channel. We study the combined impact of the supply chain partners’ choice of channels and strategic inventory on the performance of the partners and on channel efficiency.

**073-1316** Mathematical Model for Supply Chain Design with Time Postponement

Marcos Wagner Servare Jr, Student, Federal University of Espirito Santo, Brazil

Patricia Cardoso, Professor, Federal University of Espirito Santo, Brazil

In real network design problems many actors are involved, creating transportation flows and increasing the supply chain complexity. This paper proposes a feasible model for designing supply chains with time postponement to be used for small and medium-sized instances with enough computing time to support decision making.
## Friday, 01:30 PM - 03:00 PM

### Session: Resilience Challenges in Supply Chains

#### 073-1127 The Impact of Heavy-Tailed Demand Distributions on Quantity and Pricing Decisions When Facing Quantity Discounts

**Chair(s):** Kathryn Stecke  
**Session:** Resilience Challenges in Supply Chains  
**Track:** Supply Chain Risk Management  
**Location:** Grand A

Lan(Vicky) Luo, Student, Washington State University Pullman, United States  
Charles Munson, Professor, Washington State University Pullman, United States

Product markets with very uncertain customer demand reactions can wreak havoc on ordering decisions up through the supply chain. This effect may be exacerbated when suppliers offer quantity discounts that inherently inelastic order sizes. We model such an environment to develop risk-mitigation strategies for the supply chain.

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#### 073-1554 Resilience Capabilities in Agri-Food Supply Chains

**Chair(s):** Angelos Georghiou  
**Session:** Management Science and Applications in Energy  
**Track:** Energy and Natural Resources  
**Location:** Grand B

Marcelo Sá, Student, Fundacao Getulio Vargas, Brazil  
Susana Pereira, Associate Professor, Fundacao Getulio Vargas, Brazil  
Priscila Miguel, Lecturer, Fundacao Getulio Vargas, Brazil

This research aimed to understand how firms develop supply chain resilience capabilities when facing a natural disaster. A qualitative research was carried out through multiple case studies in agri-food supply chains. The main results indicate that there are more capabilities for mitigation and preparedness than for response and recovery phases.

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#### 073-1589 A Polyhedral Study on Lot-sizing Problem with Capacity Acquisition

**Chair(s):** Kathryn Stecke  
**Session:** Resilience Challenges in Supply Chains  
**Track:** Supply Chain Risk Management  
**Location:** Grand A

Jia Guo, Student, University of Alabama Tuscaloosa, United States  
Mingqiao Zhang, Assistant Professor, Kennesaw State University, United States  
Burcu Keskin, Associate Professor, University of Alabama Tuscaloosa, United States

Determining the optimal capacity level to invest is one of the fundamental problems for an enterprise’s operation. We consider a single-echelon lot-sizing problem with capacity acquisition (CALS). Two families of the so-called capacity definition and demand satisfying inequalities are proposed to describe the convex hull of CALS.

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#### 073-0378 The Turning Point Prediction of International Oil Price

**Chair(s):** Angelos Georghiou  
**Session:** Energy and Natural Resources  
**Track:** Energy and Natural Resources  
**Location:** Grand B

Fangzheng Cheng, Student, East China University of Science & Technology, China  
Tijuan Fan, Professor, East China University of Science & Technology, China  
Dandan Fan, Student, donghua university, China  
Shangling Li, Professor, McGill University, Canada

Forecasting the turning point is the core of international oil price forecasting and accurate prediction of turning points can help governments and enterprises to develop high-quality oil reserve strategy. In this research, we present an improved log-periodic power-law model to predict turning points accurately.

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#### 073-0787 Merchant Energy Trading in a Network

**Chair(s):** Kathryn Stecke  
**Session:** Resilience Challenges in Supply Chains  
**Track:** Supply Chain Risk Management  
**Location:** Grand A

Selvaprabu Nadarajah, Assistant Professor, University of Illinois at Chicago, United States  
Nicola Secomandi, Professor, Carnegie Mellon University, United States

Motivated by practice, we formulate a merchant trading energy in a network of storage and transport assets as a Markov decision process with uncertain energy prices. We develop tractable approximate dynamic programming methods to obtain operating policies and bounds, also highlighting the importance of joint storage and transport optimization.

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#### 073-0091 DEA Environmental Assessment on U.S. Industrial Sectors

**Chair(s):** Kathryn Stecke  
**Session:** Resilience Challenges in Supply Chains  
**Track:** Supply Chain Risk Management  
**Location:** Grand A

Shangling Li, Professor, McGill University, Canada  
Derek Wang, Assistant Professor, McGill University, Canada  
Toshiyuki Sueyoshi, Professor, New Mexico Tech, United States

In this research, we examine the impact of climate change actions strategically adopted by 100 companies in terms of the technology investments made to reduce emissions. All the companies are from S&P 500. Our research results will provide a snap shot of the effectiveness of the climate change programs.

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#### 073-0408 Robust Optimization With Adjustable Uncertainty Sets: Providing Frequency Reserves via Demand Response

**Chair(s):** Kathryn Stecke  
**Session:** Resilience Challenges in Supply Chains  
**Track:** Supply Chain Risk Management  
**Location:** Grand A

Angelos Georghiou, Assistant Professor, Desautels Faculty of Management, Canada

Given a fixed uncertainty set, robust optimization finds policies that minimizes costs while satisfying the constraints for all uncertainty realizations. In this work, we extend the framework by allowing both the policies and the uncertainty sets to be decision-dependent. We showcase our approach on a frequency reserves provision problem.
Friday, 01:30 PM - 03:00 PM

073-0027 The Revenue Impact of Dynamic Pricing Policies in Major League Baseball Ticket Sales
Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States
Peter Fader, Professor, University of Pennsylvania, United States
Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States

We develop and apply a comprehensive model of customer demand and choice to study the implementation of dynamic pricing by a MLB franchise on its single-game tickets. Our counterfactual results show potential revenue improvement of up to 15% through the effective use of dynamic pricing.

073-0682 Hidden City Travel and Its Impact on Airfare
Jaelynn Oh, Assistant Professor, University of Utah, United States
Tim Huh, Associate Professor, University of British Columbia, Canada

We find that price competition on hub-and-spoke flight network can give rise to hidden-city pricing anomaly. Opportunistic customer behavior to purchase hidden-city tickets may limit price competition and lower consumer surplus in the long run.

073-1090 The Value of Price Discrimination via Opaque Products
Michael Hamilton, Student, Columbia University, United States
Adam Elmachtoub, Assistant Professor, Columbia University, United States

We study the value of offering discounted opaque products, i.e., products where some features are hidden from the customer until after purchase. Opaque selling is ubiquitous in airline and hoteling contexts, in our work we study the revenue lifts garnered by offering optimally priced opaque products.

073-0595 Team-Specific Ticket Options: A safety Play for Fans?
Ovunc Yilmaz, Student, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States
Pelin Pekgun, Assistant Professor, University of South Carolina, United States
Guangzhi Shang, Assistant Professor, Florida State University, United States

Ticket options, where fans make a team-specific reservation for the right to purchase a face-value ticket if their team qualifies for final, has recently gained popularity. Using Twitter feed of a company offering these options, we analyze fan decision-making and investigate the drivers of option prices and transaction volume.

073-2030 Project Management
Ted Klastorin, Professor, University of Washington, United States
Gary Mitchell, Associate Professor, University of Portland, United States

In this tutorial, we discuss the design of a modern PM course that focuses on the management of complex risky projects. Our goal is to elevate PM curriculum above the level of traditional tools like CPM and PERT and design a course that is taught at an intellectual level.

073-0207 Specialty Coffee: Direct Trade Sourcing and Pricing Under Uncertainty
Shahryar Gheibi, Assistant Professor, Siena College, United States
Burak Kazaz, Professor, Syracuse University, United States
Scott Webster, Professor, Arizona State University Tempe, United States

We investigate sourcing and pricing decisions of an agricultural processor which engages in Direct Trade in order to be able to offer a specialty product targeted toward the quality-sensitive segment of consumers. Our study provides insights into an emerging agribusiness phenomenon in the coffee industry.

073-1074 Crop Planning in Sustainable Agriculture: Dynamic Farmland Allocation in the Presence of Crop Rotation Benefits
Onur Boyabati, Associate Professor, Singapore Management University, Singapore
Javad Nasiry, Assistant Professor, Hong Kong University of Science & Tech, Hong Kong
Yangfang Zhou, Assistant Professor, Singapore Management University, Singapore

We examine crop planning decision in sustainable agriculture, i.e., allocating farmland when crops have rotation benefits across growing seasons. Based on models calibrated to data, we study the impact of revenue uncertainty on farmers’ profitability and the economic value of sustainable agriculture. We also propose a near-optimal heuristic sustainable policy.

073-1170 Managing Perishability in the Fruit and Vegetable Supply Chain
Merve Kirici, Student, 1979, Switzerland
Olov Isaksson, Assistant Professor, Stockholm Business School, Sweden
Ralf Seifert, Professor, Epfl, Switzerland

We investigate the drivers of spoilage in the days-fresh category using daily spoilage and supply chain data (495,460 store-SKU level observations) for fresh fruits and vegetables. We quantify to what extent inventory, promotions, delivery type, commitment changes, order variations, case size, and quality issues influence spoilage.

073-0061 Exploring Humanitarian Logistics Operations Performance, an Institutional Theory Approach
Chair(s): Tigi Mersha

073-0027 The Revenue Impact of Dynamic Pricing Policies in Major League Baseball Ticket Sales
Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States
Peter Fader, Professor, University of Pennsylvania, United States
Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States

We develop and apply a comprehensive model of customer demand and choice to study the implementation of dynamic pricing by a MLB franchise on its single-game tickets. Our counterfactual results show potential revenue improvement of up to 15% through the effective use of dynamic pricing.
Friday, 01:30 PM - 03:00 PM

073-1129
A Novel Contract for Partnership Management in the Humanitarian Logistics
Ali Ghavami, Student, UoT, Iran (Islamic Republic of)
Ali Torabi, Professor, Univ of Tehran, Iran (Islamic Republic of)
Esmaeil Keyvanshokooh, Student, University of Michigan - Ann Arbor, United States

A novel contract is designed in the preparedness phase to facilitate the cooperation of humanitarian organizations with logistics service providers (LSPs) that provides the possibility of using LSPs’ relief inventories and logistics equipment in the response phase under specific conditions determined by the contract terms.

073-1340
Social Impact Measurement in Nonprofits: Implications for Service Improvement and Mission Attainment
Tigi Mersha, Professor, University of Baltimore, United States
Ven Sriam, Professor, University of Baltimore, United States

Nonprofits engage in an array of complex activities which complicates assessing their impact. This paper reviews best practices used to assess nonprofit social impact, examines the implications of effective impact measurement for performance improvement, and proposes a mission-based approach for assessing social impact of nonprofits.

073-0052
Managing Digital Advertising Campaigns
Naren Agrawal, Professor, Santa Clara University, United States
Sami Najafi, Assistant Professor, Santa Clara University, United States
Stephen Smith, Professor, Santa Clara University, United States

Advertising agencies must manage ad campaigns for a variety of clients in real time. Uncertainties in demand for campaigns, arrival rate of target users, and actions taken by other agencies make it difficult to manage campaigns according to plan. We describe a methodology to manage such ad campaigns.

073-0126
Sales Assistance Search and Purchase Decisions an Analysis Using Retail Video Data
Aditya Jain, Assistant Professor, Baruch College, United States
Sanjog Misra, Professor, University of Chicago, United States
Nils Rudi, Associate Professor, INSEAD, Singapore

We investigate the role of sales assistance and search in driving customer's purchase decision using observational video data from retail stores. Our analysis reveals that both sales assistance and search play substantial roles which differ based on the context of specific decisions.

073-0845
Optimal Assortment Strategy for Variety-Seeking Consumers
Dorothee Honhon, Associate Professor, University of Texas Dallas, United States
ismail kirci, Student, University of Texas Dallas, United States
Gurhan Kok, Professor, Koc University, Turkey

We study the optimal assortment strategy for a retailer facing variety-seeking (or variety-avoiding) consumers, i.e., customers who have a deliberate tendency to switch away from (or stay with) the brand purchased on the last purchase occasion. We study the benefits of varying assortments dynamically under finite and infinite planning horizons.

073-1141
The Hidden Costs of Dynamic Pricing: Strategic Returning and Payment Method Choice
Chaithanya Bandi, Assistant Professor, Northwestern University, United States
Antonio Moreno-Garcia, Associate Professor, Northwestern University, United States
Richard Zhijii Xu, Student, Northwestern University Kellogg School o, United States

We perform an empirical study on the online apparel retail industry in India, and we show that dynamic pricing gives rise to more product returns. We analyze this strategic returning behavior as well as other issues.

073-0204
Willingness to Stock Malaria Diagnostics in Private Sector Supply Chains
Corinne Carland, Student, Massachusetts Institute of Technology, United States
Gilberto Montibeller, Assistant Professor, London School of Economics, United Kingdom
Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States

Low-cost diagnostics are critical in avoiding non-discriminant malaria treatment, yet private sector uptake is low. We used multi-criteria value analysis to assess willingness to stock malaria diagnostics among importers, distributors, and retailers in Uganda. Results showed misaligned objectives across the supply chain and revealed opportunities to improve private sector adoption.
Mobile money allows those in developing nations without access to traditional banks the ability to save, withdraw, deposit, and send money electronically through the wireless providers' networks. We partner with a Tanzanian operator to test the impact of daily SMS suggestions and information on agents' stockout rates.

073-1873 Location, Natural Disasters, and Performance
Pavel Castka, Associate Professor, University of Canterbury, New Zealand
Mercedes Delgado, Assistant Professor, Massachusetts Institute of Technology, United States
Fiona Murray, Professor, Massachusetts Institute of Technology, United States

We focus on the impact of a natural disaster (2011 Earthquake, New Zealand) at the regional and firm levels by examining the role of firm managerial practices, including risk management and emergency preparedness, organizational practices, and various aspects of operations and supply chain management, in firm resilience to natural disasters.

073-1984 Inventory Management for Mobile Money Agents in East Africa
Karthik Balasubramanian, Student, Harvard University, United States
David Drake, Assistant Professor, Harvard University, United States

Mobile money agents exchange cash for electronic value and vice versa, forming the backbone of an emerging electronic currency ecosystem in the developing world. We model the agent's inventory problem, develop policy recommendations, and evaluate these policies with East African data.

073-0529 Insecurity in humanitarian organizations: Evidence from activity reports
Nonlanta Debe, Student, University of Groningen, Netherlands
Nathan Kunz, Assistant Professor, University of North Florida, United States
Luk van Wassenhove, Professor, INSEAD, France
Taco van der Vaart, Associate Professor, University of Groningen, Netherlands

Rising insecurity has severely impacted humanitarian organizations in recent years. We perform a content analysis of activity reports of four humanitarian organizations over the last six years. We find an increase in insecurity related incidents since 2011. We also find that the reporting of these events varies significantly across organizations.

073-1741 Security Issues in Humanitarian Relief and Response Operations in Hostile Environments: A Case Study
Hlekiwe Kachali, Lecturer, Hanken School of Economics, Finland

Operational security is an important aspect in delivery of services to beneficiaries. Increasingly however, the safety of humanitarian organisation personnel and assets in hostile environments is no longer a given. This work investigates the challenges humanitarian organisations face, and what measures can and have been employed to overcome these issues.

073-0369 Boko Haram: Relief Operations, Security, Refugees, and Internally Displaced Persons
Clement Apere, Brigadier-General, Nigeria Army, Nigeria
Richard Oloruntoba, Associate Professor, ????, Australia

Insecure operational environments threaten relief delivery. In 2015, 109 aid workers were killed, 110 wounded, 68 kidnapped and 287 suffered other significant attacks (AWSR, 2016). This presentation provides an empirical analysis of humanitarian operations and insecurity for humanitarians, refugees and internally displaced persons in the Boko Haram crises.

073-0187 On the Adoption for Smart Home Appliance for Energy Shifting
Ming Hu, Associate Professor, University of Toronto, Canada
Yannan Jin, Assistant Professor, Shanghai Univ. of Finance and Economics, China
Wenbin Wang, Associate Professor, Shanghai Univ. of Finance and Economics, China

Smart home appliance can shift energy consumption in response to energy price and thus hold great potential for reducing energy cost. We use a game theoretical approach to analyze how the adoption decisions are affected by the pricing decisions of the manufacturer, the utility company and the government subsidy.

073-0505 Optimizing the Probability and Quality of Service in Carshare Systems under Demand Uncertainty
Mengshi Lu, Assistant Professor, Purdue University, United States
Siyan Shen, Assistant Professor, University of Michigan Ann Arbor, United States
Zhihao Chen, Student, University of Michigan - Ann Arbor, United States

We consider the problem of allocating a carshare fleet to service zones under uncertain one-way and round-trip rental demand. We employ a two-stage stochastic integer programming model and solve it using branch-and-cut algorithms with mixed-integer rounding-enhanced Benders cuts. Insights are drawn from numerical results using real-world carshare data.

073-1801 Pricing and Matching with Forward-Looking Buyers and Sellers
Yiwei Chen, Assistant Professor, Singapore University of Technology and Design, Singapore
Ming Hu, Associate Professor, University of Toronto, Canada

We study an intermediary who determines a dynamic pricing and matching policy for forward-looking buyers and sellers who sequentially arrive to the system. The simple policy that the intermediary posts fixed prices on both buyer and seller sides, respectively, and matches them on a first-come first-served basis is nearly optimal.
073-003  An Adaptive Distributionally Robust Approach for Fleet Repositioning in Vehicle Sharing
Long He, Assistant Professor, National University of Singapore, Singapore
Zhennu Hu, Assistant Professor, National University of Singapore, Singapore
Meilin Zhang, Student, National University of Singapore, Singapore

We study the repositioning problem in free floating car sharing systems. We first formulate the problem as a dynamic program and then develop an adaptive distributionally robust approach that is computationally efficient. In the case study with operations. We evaluate the performance of the solution approach using Car2go operations data.

073-0441  A Modeling Approach for Evaluating Green Performances of Hotels
Kazim Sari, Associate Professor, BEYKENT UNIVERSITY, Turkey
Murat Sulu, Student, BEYKENT UNIVERSITY, Turkey

We aim to develop a tool to evaluate and compare green performances of hotels as it is a very hot topic in business today. To do this, a list of green activities are extracted from related researches. Later, a decision model is proposed with the contribution of hotel managers.

073-0140  City Distribution in European Metropolitan Areas
Hella Abidi, Student, VU University Amsterdam, Netherlands
Wout Dullaert, Professor, Vrije Universiteit Amsterdam, Netherlands

Good distribution volumes towards the city centers is increasing. We introduce new sustainable concepts within the urban areas, including the use of all available modes of transport. We, aim to show how to increase understanding of how sustainable city distribution emerge, and, to investigate whether such processes can be managed.

073-0470  A Comparative Analysis of Logistic and Environmental Efficiency of the Port Of Santos Road Access
Murillo Caldeira, Student, Centro Universitário Da Fei, Brazil
Wilson Hilsdorf, Assistant Professor, Centro Universitario Da Fei, Brazil

This study compares the models for reducing road access congestion between ports of developed countries and the Port of Santos (Brazil), Latin America’s largest port, in terms of logistic, environmental and port-city relationship. After literature review, it was found that those ports adopted different models and requires the data collection.

073-0622  Environmental Interaction Between Condominiums in the City Of São Paulo And Its Business Environment
Clovis Galdino, Professor, ESTÁCIO - FNC, Brazil
Jorge Norum, Professor, ESTACIO FNC, Brazil
Esther Cosso, Professor, ESTACIO - FNC, Brazil
Oswaldo Santos, Professor, Estácio University, Brazil
Raul Cunha, Assistant Professor, ESTACIO - FNC, Brazil

In this paper we present the results of a field survey in condominiums residences, on the responsible use of natural resources, such as gas, electric energy, water and on the other hand the discard of recyclable and non-recyclable waste and the perception of the condominiums on the practices adopted.

Gokce Esenduran, Assistant Professor, Ohio State University, United States
Yen-Ting Lin, Assistant Professor, University of San Diego, United States
Wenli Xiao, Assistant Professor, University of San Diego, United States
Minyu Jin, Student, University of San Diego, China

There are two recycling standards for e-waste recyclers that are different in stringency. The more stringent one is costlier but attracts more e-waste from environmentally conscious donors. We model the competition between recovery channels and examine how secondary market sales and economies of scale affect recyclers’ choice of recycling standards.

073-0458  Complementary Product Design and Process Technology Choices in Recycling
Luyi Gui, Assistant Professor, University of California Irvine, United States
Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States
Atalay Atasu, , Georgia Institute of Technology, United States

Motivated by the Japanese implementation of the Home Appliance Recycling Law, we study the complementarity between product design and technology choices for recycling. We evaluate the environmental benefit of recycling capacity sharing between producers and of producers’ investment in recycling facilities.

073-1864  Motivating Suppliers’ Pollution Reduction Efforts via Sourcing Strategies
Shi Chen, Assistant Professor, University of Washington, United States
Qingin Zhang, Data Scientist, Microsoft Corporation, United States
Warren Hausman, Professor, Stanford University, United States

We consider two suppliers investing in pollution abatement innovations and choosing end-of-pipe pollution reduction effort, when a buyer chooses sourcing strategies. The buyer either allocates more demands to the better supplier (dual sourcing), or gives the better supplier a higher chance of getting all demands (single sourcing).
073-0626  
**Empirical Study: Disentangling the Performance Effects of Consignment Stock Agreements**  
Roel Post, Student, University of Groningen, Netherlands  
Paul Buijs, Lecturer, University of Groningen, Netherlands  
Iris Vis, Professor, University of Groningen, Netherlands  

We examine a consignment stock implementation where a retailer allows multiple upstream suppliers to control inventory at its warehouse. Using transaction data, we disentangle the performance effects of three organizational changes associated with implementing consignment stock: the physical location of stock, the extent of information sharing, and decision transfer.

073-0587  
**Panel Data Analysis of the Effect of Operations and Supply Chain Performance on Financial Performance**  
Dahee Lee, Student, Korea University, Korea  
Keontaek Oh, Student, Korea University, Korea  
Jebum Pyun, Lecturer, Sookmyung Women's University, Korea  
DaeSoo Kim, Professor, Korea University, Korea  

This study empirically analyzes the effect of operations and supply chain performance on financial performance, using financial time series data for Forbes Global 2000 companies. The findings from panel data analysis provide practical and theoretical insights on the causality between operations/supply chain performance and financial performance indicators.

073-0522  
**Design and Management of Service Outsourcing Contracts: A Multi-industry Empirical Analysis**  
Yuan Ye, Student, University of Houston, United States  
Xiaosong Peng, Associate Professor, University of Houston, United States  

We develop an empirical study to investigate the contract design and management practices in service outsourcing. We intend to benchmark these practices in different industries (e.g., healthcare, oil and gas, and manufacturing) and identify the best practices that drive success outcomes in service outsourcing.

073-1491  
**Breaking News in Prediction Markets**  
Adam Schultz, Student, University of Chicago, United States  
John Birge, Professor, University of Chicago, United States  
Bora Keskin, Assistant Professor, Duke University Durham, United States  

We develop an empirical model to evaluate the role of market markers in a prediction market. Using a novel dataset, we study the impact of breaking news on betting markets for NBA basketball games, exploring questions such as if market makers are proactive or reactive when adjusting prices.

073-0557  
**Experiment Of Hospital Unit Admission Decision Behavior Under Congestion And Patient Severity Uncertainty**  
Song-Hee Kim, Assistant Professor, University of Southern California, United States  

Hospital inpatient units have limited capacity. We explore how physicians make admission decisions in order to understand how to improve this important decision-making process. Specifically, in a controlled laboratory experiment setting, we observe and compare admission decision-making behaviors based on current unit occupancy and severity of arriving patient conditions.

073-1845  
**Impact Of Uncertainty About Co-Workers Capability on Server Behavior in Queueing Systems**  
Masha Shunko, Assistant Professor, University of Washington, United States  
Yaroslav Rosokha, Assistant Professor, Purdue University, United States  
Saurabh Bansal, Assistant Professor, Penn State University University Park, United States  

In business environments where multiple servers process individual orders, but receive payment based on the team performance, we study the impact of uncertainty about team members' ability on the productivity of workers using a behavioral lab experiment. We show that uncertainty may impact the negative effect of social loafing.

073-0637  
**Beyond Fixed Effects: A Psychological Perspective on Servers' Operational Performance in Service Queuing Systems**  
Ahmad Ashkanani, Student, Krannert School of Management, United States  
Benjamin Dunford, Associate Professor, Krannert School of Management, United States  

Previous research in service queuing literature has treated servers' psychological factors as fixed effects, which limits our understanding of the behavioral drivers of servers' operational performance. We find evidence that these factors are more important than currently understood and test our hypotheses using longitudinal data from servers in call centers.

073-1072  
**Customer Cooperation in Service Systems**  
Chenguang Allen Wu, Student, Northwestern University, United States  
Chen Jin, Student, University of Pennsylvania, United States  

We consider a service provider facing a heterogeneous customer population. To decide whether to join service, self-interested customers maximize their utility based on self-rationalize while cooperative customers optimize the aggregate utility of the cooperative group. We identify the free-rider phenomenon and characterize the optimal pricing decision of the service provider.
073-0737  Can Brands Claim Ignorance? Unauthorized Subcontracting in Apparel Supply Chains  
Felipe Caro, Associate Professor, University of California Los Angeles, United States  
Anna Saez de Tejada Cuenca, Student, University of California Los Angeles, United States  
Many violations of labor standards in the apparel industry are related to unauthorized subcontracting. We analyze empirically what factors lead suppliers to outsource their production without their retailers' knowledge. We provide managerial insights on which factory and order characteristics increase the probability of unauthorized subcontracting, and how to prevent it.

073-1000  Strategic Complements or Substitutes: Testing Complementarities in a Structural Model of an Online Advertising Supply  
Anitshed Barua, Professor, McCombs School of Business, United States  
Genaro Gutierrez, Associate Professor, McCombs School of Business, United States  
Changseung Yoo, Student, McCombs School of Business, United States  
In the empirical literature on testing complementarities, no distinction has been made between the existence of complementarity and recognizing and acting upon such complementarity. To address this gap, we analyze how a decision maker's understanding of complementarities can affect the empirical evidence of complementarities or substitutabilities within a structural model.

073-0040  Why Do Automakers Initiate Recalls? A Structural Econometric Game  
Ahmet Colak, Student, Northwestern University, United States  
Robert Bray, Associate Professor, Northwestern University, United States  
We model a manufacturer's and regulator's joint recall decisions as an asymmetric dynamic discrete choice game. We estimate our model with auto industry data comprising 14,124 recalls and 976,062 defect reports. We find that firms initiate recalls to avoid product failures but not to preempt government recalls.

073-0921  The Impact of IS System and Relationship Commitment on Process and Planning Coordination and Performance  
Siyu Li, Student, Zhejiang University, China  
Baofeng Huo, Professor, Zhejiang University, China  
Xinde Zhao, Professor, China Europe International Business School, China  
Based on SCOR model, we divided customer coordination into customer planning and process coordination. Using 410 mainland manufacturers samples, we empirically tested the impact of customer information sharing system and customer relationship commitment on customer process and planning coordination and operational performance. This study significantly contributes to theories and practices.

073-0489  IoT Location-Based Services Technologies for Tracking Carts in an Airmail Facility  
Chun-Hung Cheng, Associate Professor, Chinese Univ of Hong Kong, Hong Kong  
Yong-Hong Kuo, Assistant Professor, Chinese Univ of Hong Kong, Hong Kong  
In a fast moving mail facility, it is important to correctly locating and fetching carts containing mail bags for the same flight quick enough to catch up with the schedule. To help achieve this objective, we deployed a prototype system based on IoT location-based services technologies in this facility.

073-1224  Mobile Technology in the Management of Machines Maintenance Services in Sugar Mills  
Sergio Pelicano, Student, Centro Paula Souza, Brazil  
José Neves, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil  
In sugar mills, the software implantation in mobile devices contributed to reduction in process costs, improvement of speed of access to service order data and mainly for quality of information collected, streamlining the maintenance processes in equipment in the field.

073-0055  Delegated Testing of Design Alternatives: Selectionism vs. Trial-and-Error  
Jochen Schlapp, Assistant Professor, University of Mannheim, Germany  
Gerrit Schumacher, Student, University of Mannheim, Germany  
The testing of different design alternatives is a vital element of any R&D process. Yet, in reality, the benefits of testing are not easy to harvest because these activities are usually delegated to experts who may pursue their own agenda. We examine how to optimally incentivize these experts.

073-0098  Licensing Contracts With Reciprocal Buyout  
Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore  
Pascale Crama, Associate Professor, Singapore Management University, Singapore  
Joint R&D allows firms to combine complementary capabilities, but is difficult to organize in the face of uncertainties surrounding the future product and skills needed to bring it to market. We analyze how contracts with reciprocal buyout options can help to organize joint R&D to mutual advantage.

073-1517  Information Exchange in Parallel Search  
Ni Fang, Student, University of Cologne, Germany  
Fabian Sting, Associate Professor, Rotterdam School of Management, Netherlands  
How should organizations share and use information in parallel innovation, from an internal and external competitive perspective? Using a framework of co-evolutionary search on a technology landscape, we demonstrate how firms can strike a balance for the fundamental trade-off: the efficiency of channeled search vs. the breadth of autonomous search.

073-0163  Perils of Bargaining Power in R&D Licensing  
Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore  
How do firms face the tension between the benefits of maintaining R&D bargaining power and the costs of pursuing R&D on their own?
We initially find support that larger monetary commitments by licensees create higher hurdles to clear and increase the likelihood of terminations in licensing agreements. Upon further investigation, we find that this observation is due to endogeneity. Taking bargaining power into account alters the impact of deal value on terminations.

Global health buyers seek to introduce competition by incenting new generics suppliers with uncertain performance/quality to enter the market. We investigate the benefits of postponing a portion of the procurement volume to learn entrant’s performance and how the dynamics of learning and competition depend on the size of the postponed volume.

Increasing accessibility to contraceptive products is deemed a critical step towards improving maternal health and preventing unwanted pregnancies. Utilizing data from service delivery points in Africa, we investigate the relationship between stock-outs of contraceptive products and supply-related factors such as product variety, service, data analysis capability, and supply risk.

Remote healthcare systems alert patients to suggest proper medical intervention before undesirable event occurs. However, it is not trivial to establish an optimal alerting strategy because of the alert compliance issue. In this paper, we investigate the impact of patients’ cognitive mechanisms (skeptics vs. empiricists) on the optimal alerting policy.

We consider a bipartite queueing system (BQS) with multiple types of servers and customers, where different customer-server combinations may generate different utilities. We develop a fluid model to approximate the behavior of such a BQS system, and show that the fluid limit process can be computed over any finite horizon.

Tasks with long duration often need to have their progress reported periodically to process controllers. Thus, workers that process multiple tasks simultaneously need to schedule their work carefully in order to demonstrate satisfactory progress. We present a scheduling model that reflects this requirement. Solution methods of this model are discussed.

In this paper, we propose an exact algorithm for task assignment problem. For aircrafts to land and take off safely and yet on schedule, airpord ground staffs work in shifts to perform in the tasks. In order to gain integer solutions, a branch-and-bound algorithm is developed.

Our work is motivated by a real-world task assignment problem when managing air cargo operations. The tasks are assigned to teams based on considerations such as manpower requirements, team shift times, workload balance, and meal and rest break requirements. We have developed an optimization tool to aid decision-making.
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<tr>
<th>Track: Marketing and Operations Management Interface</th>
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<tbody>
<tr>
<td><strong>073-0366</strong> Does Reducing the Size Of a Product's Packaging Impact Its Sales And Promotional Display Effect?</td>
</tr>
<tr>
<td>Olga Pak, Student, University of South Carolina, United States</td>
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<tr>
<td>Mark Ferguson, Professor, University of South Carolina, United States</td>
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<td>Michael Galbreth, Professor, University of South Carolina, United States</td>
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<td>Although sustainable and operationally efficient, consumer goods with reduced packaging might result in the loss of product's physical appeal due to reduced shelf visibility and the inaccurate impression of reduced product content. We investigate this question empirically, using a large nationwide dataset of consumer good transaction data.</td>
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<tr>
<td><strong>073-1576</strong> Determinants of Beef Bull prices: An auction interquantile analysis</td>
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<tr>
<td>Anderson Amorin, Student, URI / UFRGS, Brazil</td>
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<tr>
<td>Ricardo Correa, Student, Federal University of Rio Grande do Sul, Brazil</td>
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<td>Francisco Kliemann Neto, Professor, Federal University of Rio Grande do Sul, Brazil</td>
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<td>Joana De Souza, Professor, Federal University of Rio Grande do Sul, Brazil</td>
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<td>We investigate the variables that in an auction had bigger influence over the final price of Bradford bulls. We use animal characteristics as independent variables and sale price as dependent variable in a quantile regression. In this sense we identify the variables most influence the final prices in each quantile.</td>
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<td><strong>073-0438</strong> Guaranteed Trade-in Price Strategy: Deconstructing Its Value for Consumers and Firms</td>
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<tr>
<td>Shuyu Yin, Associate Professor, University of California Irvine, United States</td>
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<td>Mehmet Gumus, Associate Professor, Mcgill University, Canada</td>
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<td>Saiab Ray, Professor, Mcgill University, Canada</td>
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<tr>
<td>Wenju Niu, Student, Nanjing University, China</td>
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<td>Houcai Shen, Professor, Nanjing University, China</td>
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<td>Guaranteed trade-in program is new ownership model that firms offer to consumers giving them the option to return their used durables for a pre-specified resale value. In this paper, we study value of such a strategy and the sources of that value from the dual perspective of firm and consumers.</td>
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<tr>
<td><strong>073-1121</strong> A Cultivation Planning Model Considering the Price Uncertainty Based on One-Shot Decision Theory</td>
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<tr>
<td>Jingyuan Feng, Student, Dalian University of Technology, China</td>
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<tr>
<td>Liujun Sun, Associate Professor, Dalian University of Technology, China</td>
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<td>Xiangpei Hu, Professor, Dalian University of Technology, China</td>
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<td>We develop a multistage one-shot decision making approach to generate greenhouse cultivation plan under uncertain market. Besides theoretical method, practical example of the general greenhouse in Liaoning, China is provided to illustrate the approach.</td>
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<tr>
<td><strong>073-1223</strong> Optimal Ordering, Pricing and Preservation Investment Decisions for Non-Instantaneously Deteriorating Items with Partial Backlog</td>
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<tr>
<td>Guiping Li, Assistant Professor, Ningbo University, China</td>
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<tr>
<td>Xiuil He, Associate Professor, University of North Carolina Charlotte, United States</td>
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<tr>
<td>Jing Zhou, Associate Professor, University of North Carolina Charlotte, United States</td>
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<td>This paper studies a joint ordering, pricing and preservation investment decision for non-instantaneously deteriorating items with price-sensitive demand rate, time-varying deterioration rate and waiting-time-dependent partial backlog to maximize the average profit. Non-deterioration period and deterioration rate can be controlled by preservation investment. There exists salvage values for deteriorated items.</td>
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<td><strong>073-0273</strong> On The Profitability of Stacked Discounts: Identifying Revenue and Cost Effects of Discount Framing</td>
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<tr>
<td>Necati Ertekin, Assistant Professor, Santa Clara University, United States</td>
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<td>Jeffrey Shulman, Associate Professor, University of Washington, United States</td>
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<tr>
<td>Haipeng (Allan) Chen, Associate Professor, Texas A&amp;M University College Station, United States</td>
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<td>Though previous research has demonstrated that stacked discounts increase retail revenue, we uniquely identify a novel tradeoff relating to stacked discounts: stacked discounts lead to higher return rates. The findings have implications for retailers in assessing the impact of how they frame their price discounts.</td>
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<tr>
<td><strong>073-0565</strong> Managing Online Content To Build A Follower Base</td>
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<tr>
<td>Felie Caro, Associate Professor, University of California Los Angeles, United States</td>
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<tr>
<td>Victor Martinez-de-Albeniz, Associate Professor, I E S E, Spain</td>
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<td>Content providers manage a dual objective of generating interest for current followers and at the same time reaching out to new audiences that may become repeat visitors. We formulate a simple model to study follower base build-up dynamics under the assumption that the attractiveness of past content decays over time.</td>
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<td><strong>073-0526</strong> Invite Your Friend and You'll Move up in Line: Leveraging Social Ties via Operational Incentives</td>
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<td>Luyi Yang, Student, University of Chicago, United States</td>
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<td>Laurens Debo, Associate Professor, Dartmouth College, United States</td>
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<td>The study introduces a simple yet effective operational incentive that leverages social ties to improve customer waiting time in a queue. We develop a queuing model to analyze the impact of the operational incentive and compare it with the baseline scenario.</td>
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<td><strong>073-0526</strong> On The Profitability of Stacked Discounts: Identifying Revenue and Cost Effects of Discount Framing</td>
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</tr>
</tbody>
</table>
### Dynamic Substitution Policy for Selling Multiple Products
Qi Feng, Professor, Purdue University, United States
Chengzhang Li, Student, Purdue University, United States
George Shinthikumar, Professor, Purdue University, United States

We study a firm selling multiple substitutable products over a selling horizon. In each period, when the random demands materializes, the firm may choose one product to meet the demand for another at a cost. We design an efficient algorithm that delivers close-to-optimal performance.

### Bundled Payment vs. Fee-for-Service: Impact of Payment Scheme on Performance
Shima Nassiri, Student, University of Washington/ Business Schoo, United States
Elodie Adida, Associate Professor, University of California Riverside, United States
Hamed Mamani, Associate Professor, University of Washington, United States

The new healthcare legislation tests new payment models such as the bundled payment (BP) system. Our interest is in analyzing the effect of different payment schemes on outcomes such as the presence and extent of patient selection, treatment intensity, the provider's utility and financial risk, and total system payoff.

### Will Communication Cost Increasing Always Shorten a Product Line?
Xiang Ji, Student, University of Science and Technology of China, China
Qingning Cao, Associate Professor, University of Science and Technology of China, China
Yunchuan Liu, Associate Professor, University of Illinois Urbana-Champaign, United States

The increase of communication cost can sometimes strengthen a firm's incentive to extend its product line, even if consumer heterogeneity is low, or consumer confusion is high, or firm's ability of target communication is poor.

### Layered CMS with Multiple Shifts and Machine Duplication Considering Optimal Manpower Allocations
Bulent Erenay, Assistant Professor, Wilkes University, United States
Gursel Suer, Professor, Ohio University, United States

In this study the layered cellular manufacturing system concept is improved considering shifting bottleneck machines, machine duplication and multiple shifts. A two stage methodology is developed using mathematical models. First model determines optimal number of operators assigned, second model minimizes the number of cells opened and determines cell types.

### Concurrent Production: Producing SKUs/Orders in Close Synchronization With End-Customer Demand
Richard Schonberger, Independent researcher/author, Independent, United States

Most manufacturers have many active orders/SKUs seeking capacity on few production lines. The result is elevated customer lead times and wrong-mix inventories, accompanied by excessive run rates in efforts to cope. Correctively, concurrent production employs multiple equipment units producing multiple orders or SKUs simultaneously in close synch with end-customer usage.

### Machine Cell Design for Parts with Operation Sequence and Demand Distribution
Godwin T, Associate Professor, IIM Tiruchirappalli, India

A machine cell design problem is considered where each part has an operation sequence and a demand distribution. A demand sampling approach in conjunction with mathematical program is proposed that helps in coming up with a machine cell configuration that could accommodate varying demands of a part in each order.

### Responsiveness Through the Fit Of Reconfigurable Manufacturing System, TQM, HR, JIT, Technology, Manufacturing Strategy
Cesar Ortega, Student, UNIVERSIDAD NACIONAL AUTONOMA DE HONDURAS, Honduras
Jose Machuca, Professor, Universidad De Sevilla, Spain
Maria Lopez, Student, UNIVERSIDAD NACIONAL AUTONOMA DE HONDURAS, Honduras
Pedro Garrido-Vega, Associate Professor, Universidad De Sevilla, Spain

A framework for reconfigurable manufacturing systems and some supporting manufacturing programs is presented to examine relationships with responsiveness, and to customer needs. Thus, a systemic perspective is proposed, using profile deviation fit, from 309 plants in transportation, electronics and machinery industries of 14 countries on Asia, America and Europe.

### The Impact of Uncertain Work Contents in Engineer-To-Order Production on the Logistic Objectives
Moritz Haux, Student, Technische Universität Hamburg-Harburg, Germany
Hermann Lödding, Professor, Technische Universität Hamburg-Harburg, Germany
Axel Friedewald, Senior Lecturer, Technische Universität Hamburg-Harburg, Germany

Simultaneous design and process planning in engineer-to-order production cause uncertain work contents. The data are used in the subsequent production planning and affect the logistic objectives. We present a model that explains how uncertain work objectives influence the logistic objectives and costs.

### Inventory Turns and Finite-Horizon Little’s Laws
Weiwei Chen, Assistant Professor, Rutgers University, United States
Benjamin Melamed, Professor, Rutgers University, United States
Inventory turns have been used for measuring flow velocity through the inventory and the efficiency of asset utilization. This paper presents finite-horizon versions of Little’s Law and a unified prescriptive model for relating inventory turns to sojourn times through an inventory system, thereby facilitating more accurate computation of inventory turns.

073-0846  Product Quality Differentiation Through Information Provision  
Huaqing Wang, Assistant Professor, Emporia State University, United States  
Haresh Gumani, Professor, Wake Forest University, United States  
Raphael Boleslavsky, Assistant Professor, University of Miami, United States

We examine the joint interaction of information provision and pricing decisions by two competitive firms when a buyer is uncertain about product valuations. Firms generate product differentiation by allowing consumers to learn about valuations or prevent them from doing so. We characterize equilibrium prices and its interaction with information policies.

073-0876  Strategic Pricing and Platform Choice in Reward-Crowdfunding: Network Externalities and Two-Sided Learning  
Fasheng Xu, Student, Washington University St Louis, United States  
Fugang Zhang, Professor, Washington University St Louis, United States

In reward-crowdfunding, production-based firms pre-sell a new product and solicit financial contributions from the crowd. We provide a model that captures three salient features (i) network externalities, (ii) two-sided learning and (iii) strategic consumer behavior, as a decision support framework to address strategic interactions between firm and consumer population.

073-0514  Strategic Inventory and Supplier Encroachment  
Huqi Guan, Student, University of Miami, United States  
Haresh Gumani, Professor, Wake Forest University, United States  
Xin Geng, Assistant Professor, University of Miami, United States  
Yadong Luo, Professor, University of Miami, United States

We study the interaction between strategic inventory and supplier encroachment in a two-period model. The buyer may withhold inventory and the supplier can introduce a direct channel in the second period. We find that irrespective of buyer’s unit holding cost, strategic withholding may occur and supplier’s encroachment strategy is distorted.

073-1344  Queueing Analysis of Perishable Inventory Under a Base Stock Policy  
Katsunobu Sasanuma, Assistant Professor, Stony Brook University, United States  
Christine Pitocco, Professor, Stony Brook University, United States  
Thomas Sexton, Professor, Stony Brook University, United States  
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

We study control policies for perishable inventory systems using a queueing model with reneging. We present a method to find an optimal base stock level and demonstrate its validity by comparing with simulation results.

073-0665  Preservation of Additive Convexity and Its Applications in Stochastic Optimization Problems  
Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong  
Tong Wang, Student, The Chinese University of Hong Kong, Hong Kong

We establish two new preservation results of additive convexity for a class of optimal transformation problems and a class of optimal disposal problems, where the optimal policies provide different priorities to the transformation/disposal decisions. We demonstrate the applications of our results to several important stochastic optimization problems in operations management.

073-0400  Hold Safety Inventory Before, At, or After the Fan-Out Point?  
Bo van der Rhee, Professor, Nyenrode University, Netherlands  
Glen Schmidt, Professor, University of Utah, United States

We consider a product with multiple variants, each with uncertain demand, produced in a multi-stage process. We use insights from an analytical study to develop a simple heuristic that near optimally determines where safety inventory should be held. We also explore when postponement is, and is not, most valuable.

073-1114  Coordinating Inventory and Pricing Decisions with General Price-Dependent Demands  
Xiaohei Shen, Associate Professor, University of Science and Technology of China, China  
Yimin Yu, Assistant Professor, City University of Hong Kong, Hong Kong  
Lina Bao, Student, University of Science and Technology of China, China

We consider a periodic-review, joint inventory and pricing control problem for a firm that faces general random price-dependent demands. For both the lost-sales model and backorder model, we derive some quite general sufficient conditions to ensure the optimality of a base-stock list price (BSLP) policy.
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<th>Session ID</th>
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<th>Authors</th>
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<td>Reducing Excess Hospital Readmissions Under the Affordable Care Act: Does Destination Matter?</td>
<td>Min Chen, Assistant Professor, Florida International University, United States</td>
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<td>073-0564</td>
<td>Evaluating Telemedicine Adoption in Clinics: Accounting for Socioeconomic, Geographical, Organizational and Technological Antecedents</td>
<td>Xiaojin Liu, Student, University of Virginia, United States, Susan Goldstein, Associate Professor, University of Minnesota, United States, Karen Soderberg, Assessment and Evaluation Coordinator, Minnesota Department of Health, United States, Kingshuk Sinha, Professor, University of Minnesota, United States</td>
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<tr>
<td>073-1678</td>
<td>Do Penalties Matter? Examining Effect of Penalty on Compliance</td>
<td>Rachna Shah, Associate Professor, University of Minnesota, United States</td>
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<td>073-0515</td>
<td>High Quality at a Low Cost: Can it be Achieved?</td>
<td>Claire Senot, Assistant Professor, Tulane University, United States</td>
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<td>073-1019</td>
<td>Job Design: Linking a Hospital's Patient-Orientation to Patient Satisfaction</td>
<td>David Dobrzykowski, Associate Professor, Rutgers University, United States, Kathleen McFadden, Professor, Northern Illinois University, United States</td>
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<td>073-1158</td>
<td>Behavior Aware Service Staffing</td>
<td>David Cho, Assistant Professor, Woodbury University, United States, Kurt Brethauer, Professor, Indiana University, United States, Kyle Cattani, Associate Professor, Indiana University, United States, Alex Mills, Assistant Professor, Indiana University, United States</td>
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<td>073-1350</td>
<td>Design and Implementation of Patient-Centric Standardized Discharge on Care Delivery Performance: A Quasi-Experimental Investigation</td>
<td>Gopesh Anand, Associate Professor, University of Illinois Urbana-Champaign, United States, Aravind Chandrasekaran, Associate Professor, Ohio State University, United States</td>
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<td>073-1428</td>
<td>Could the Cheapest be the Best? Optimal Resource Allocations For Personalized Medicine</td>
<td>Kellas Cameron, Student, Boston University, United States, Nitin Joglekar, Associate Professor, Boston University, United States</td>
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<td>073-1278</td>
<td>CherryPicking Kidneys and Patients: Incentives in Transplant Centers</td>
<td>Mazhar Arikan, Assistant Professor, University of Kansas, United States, Baris Ata, Professor, University of Chicago, United States</td>
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**Friday, 04:30 PM - 06:00 PM**

**Session: Improving Quality along the Continuum of Care**

**Chair(s):** Claire Senot
Friday, 04:30 PM - 06:00 PM

The CMS’ Condition of Participation requirements evaluate transplant centers based on one-year patient and organ survival rates post transplantation. Using actual transplant data, we empirically analyze some potential unintended consequences of these regulations such that more risk averse centers choose healthier patients and higher quality organs to transplant.

073-1740 Competitive Equilibria in Two-Sided Matching Markets with General Utility Functions
Saeed Alaie, Research Scientist, Google Research, United States
Kamal Jain, Scientist, Faia, United States
Azarakhsh Malekian, Assistant Professor, University of Toronto, United States

We present an exact characterization of competitive equilibria with non-quasilinear utility functions. Our characterization is recursively defined based on the competitive equilibria of certain strict subsets of that market—obtained by removing exactly one agent. This characterization captures the effect of competition when agents are added or removed from the market.

073-0804 Offer Batching for Organ Placement
Tinglong Dai, Assistant Professor, Johns Hopkins University, United States
Sommer Gentry, Professor, United States Naval Academy, United States
David Axelrod, Professor, Dartmouth College, United States
Sridhar Tayur, Professor, Carnegie Mellon University, United States
Dorry Segev, Professor, John Hopkins University, United States

In this study, we consider an OPO’s problem of determining the optimal batch size of simultaneous offers made to transplantation centers. We model the strategic interaction among transplant centers both within and across batches, generating structural properties and computational insights.

Dorothy Segev, Associate Professor, University of California, Los Angeles

We illustrate the probabilistic approach to determining the optimal batch size of simultaneous offers made to transplantation centers. We model the strategic interaction among transplant centers both within and across batches, generating structural properties and computational insights.

073-1643 A Centralized Allocation Mechanism for Public Housing
Yichuan Ding, Assistant Professor, University of British Columbia, Canada
Mahesh Nagarajan, Associate Professor, University of British Columbia, Canada

We look into the typical scenario where agents wait in queue to apply to certain housing communities. The agents can be existing tenants or newcomers, and they are allowed to apply to multiple houses. The questions we are interested in: i) revenue maximization ii) minimize the backlogs of the queue.

073-1956 Analyzing Health and Cost Impacts for Pediatric Asthma
Pinar Keskinocak, Professor, Georgia Institute of Technology, United States
Paul Griffin, Professor, Georgia Institute of Technology, United States
Julie Swann, Professor, Georgia Institute of Technology, United States
Melike Yildirim, Student, Georgia Institute of Technology, United States

Pediatric asthma is one of the 6 priority conditions identified by the CDC for targeted policy interventions. We analyze claims data for children on Medicaid to determine which interventions are most appropriate for children with different characteristics with the goal of reducing emergency room visits and hospitalizations.

073-1388 Assessing the Effectiveness of Information Transfer in Anesthesia Provider-provider Handoffs During Operative Procedures
Leily Farrokhvar, Assistant Professor, West Virginia University, United States

Intraoperative handoff, the process of patient care exchange between anesthesia providers during a surgical procedure, involves the transmission of medical data and can be a significant source of medical error. In this study, we seek to improve patient safety and outcomes by investigating the quality and precision of intraoperative handoffs.

073-0129 Ambidextrous Sustainability: The Role of Supply Chain Strategic Capabilities
Mehmet Yalcin, Student, University of Rhode Island, United States
Dara Schniederjans, Assistant Professor, University of Rhode Island, United States
This paper investigates how organizations can balance the priorities of environmental, social and economic sustainability. Case study results from firms with a differing sustainability focus, provide a sense of the differing pressures and moderating variables which play a role in achieving an “equal footing posture” in sustainability.

**073-1447** Supply Chain Ambidexterity (SCX): A New Model  
Mehmet Yalcin, Student, University of Rhode Island, United States  
Douglas Hales, Professor, University of Rhode Island, United States

This study examines the relevance of supply chain ambidexterity (SCX) though the lens of Ambidexterity Theory (AT). This provides the conceptual basis to examine how two existing concepts of supply chain integration (SCI) and supply chain agility (SCA), that have been applied in industry, together may lead to SCX.

**073-1459** Measuring and Managing Supply Chain Ambidexterity (SCX)  
Mehmet Yalcin, Student, University of Rhode Island, United States  
Douglas Hales, Professor, University of Rhode Island, United States

Fit between the supply chain ambidexterity (SCX) research model developed by Yalcin&Hales(2016) and primary survey data is tested via structural equation modeling methodology. Theoretical and managerial implications are provided in light of the results. Limitations and future research directions are discussed in conjunction with the proposed SCX management framework.

**073-1630** An Empirical Investigation of Supply Chain Relationship Configuration in Emerging Markets  
Ling Li, Professor, Old Dominion University, United States  
Honggeng Zhou, Professor, Zhejiang University, China  
Li Ding, Student, Polytechnic Univ, Hong Kong

This study tests a theoretical topology of supply chain relationship configuration using empirical data from emerging markets. Furthermore, the study has identified the differences of organisational learning patterns associated with different supply chain relationship configurations in the emerging economy. Explorative and exploitative learning could result in potential evolutionary paradigm shift.

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<th>Track: Supply Chain Management</th>
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| **122** Friday, 04:30 PM - 06:00 PM, Evergreen I  
**Session:** Digitization in the Supply Chain  
**Chair(s):** ZENON MICHAELIDES |

**073-0743** Managing Risk and Security in Digital Supply Chains  
Hamid Noori, Professor, Lazaridis School of Business & Economics, Canada

Security and risk in digital supply chains are posing great operational and managerial challenges to many companies. In this presentation, we will discuss some of our findings to-date and will present a conceptual framework for potential research opportunities in this area.

**073-1214** Digital transaction and its impact on Retail Supply Chain performance  
Prakash Awasthy, Research Associate, DI Lab, IIIMB, India  
Krishna Sundar Diatta, Professor, IIIMB, India  
Shashank Garg, Principle Architect, DI Lab, IIIMB, India

This empirical research work studies retail supply chains and use of an experimental retail application model that facilitates micro-payments for retail transactions. The impact of digital transactions at the bottom of the pyramid on supply chain efficiencies, on working capital requirements and linkages with the supplier networks are studied.

**073-1543** Smart Products and Focal Firms: Investigating Challenges of Value Creation Architectures in Smart Manufacturing  
Sabine Baumann, Professor, Jad University, Germany  
Oliver Eulenstein, Professor, Iowa State University, United States  
Kevin Scheibe, Associate Professor, Iowa State University, United States  
Christoph Wunck, Professor, Jade University, Germany

Assigning smart products with decision-making capabilities means that no focal firm manages and controls the value creation architecture, but the smart product selects participants while the processes must be integrated through (almost) real-time synchronization. We investigate the developments and the ensuing challenges for value creation architectures in smart manufacturing.

**073-1881** Big Data Driven Demand Networks  
Zenon Michaelides, Lecturer, 1979, United Kingdom  
Naly Rakoto, Associate Professor, Ecole Des Mines De Nantes, France  
Roula Michaelides, Senior Lecturer, University of Liverpool, United Kingdom

Today’s supply chains are being transformed into ‘demand networks’. Operations management plays an increasingly important role in supporting and sustaining such demand networks, helping companies to seamlessly integrate services, whilst leveraging the latest offerings in information technology, thus creating ‘big data-driven demand networks’ as a new paradigm in OM.

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| **123** Friday, 04:30 PM - 06:00 PM, Grand A  
**Session:** Sourcing Issues in Supply Chain  
**Chair(s):** Burcu Keskin |

**073-0690** Optimal Sourcing Decisions and Information Sharing under Multi-Tier Disruption Risk in a Supply Chain  
JoHo Yoon, Assistant Professor, Kansas State University, United States  
Sri Talluri, , Michigan State University, United States  
Claudia Rosales, Assistant Professor, Michigan State University, United States

This paper considers a manufacturer’s sourcing decision in a three-tier supply chain under upstream disruption risks. We study different information sharing mechanisms under which the manufacturer can obtain ST information, and how this information impacts not only manufacturer’s but also FT’s decisions and potential profits.
Friday, 04:30 PM - 06:00 PM

073-1551 Flexible Supply Chain Network Design through Capacity Planning
Nima Salehi Sadghiani, Student, University of Michigan - Ann Arbor, United States
Mark Daskin, Professor, University of Michigan - Ann Arbor, United States

Traditional Supply Chain Network Design Problems assume uncertain parameters can take values independently. However, this assumption is not accurate when a correlation among the parameters exists. In this research, we propose a distributionally robust framework to hedge against the worst-case correlation among the parameters for global sourcing decisions under uncertainty.

073-0459 Optimal Sourcing from Ambiguously Correlated Suppliers
Ming Zhao, Assistant Professor, Bauer College of Business, United States
Nickolas Freeman, Assistant Professor, University of Houston, United States

We study for the optimal sourcing strategy for a firm where suppliers face correlated disruptions that are difficult to estimate. We develop a distributionally robust model for a single group of correlated suppliers and a more general model where suppliers are grouped based on common sources of vulnerability.

073-1989 A Proactive Multi Objective Model to Manage Supply Chain Risk
Zohreh Khajasteh Ghamari, Student, Sophia University, Japan
Takashi Irohara, Professor, Sophia University, Japan

The purpose of this study is to discuss a proactive model to manage the supply chain risk and compare the results with an existing approach. Objective of this model is the optimal selection of material providers based on cost and reliability considering risk and uncertainty of suppliers.

073-1285 The Optimal Use of In-House Production as a Mitigation Strategy for Supply and Demand Uncertainty
Nickolas Freeman, Assistant Professor, University of Houston, United States
Burcu Keskin, Associate Professor, University of Alabama Tuscaloosa, United States
Sharif Melouk, Associate Professor, University of Alabama Tuscaloosa, United States
John Mittenthal, Associate Professor, University of Alabama Tuscaloosa, United States

We study the optimal use of in-house production and multi-sourcing for a firm subject to supply and demand uncertainty. Production activities for finished products and components share a single, limited production resource. We discuss the optimal sourcing strategy under various conditions and provide related managerial insights.

073-0517 Optimal Timing of Inventory Decisions Under Price Uncertainty
Vishal Gaur, Professor, Cornell University, United States
Nikolay Osadchyi, Assistant Professor, Emory University, United States
Sridhar Seshadri, Professor, Indian School of Business, India
Marti Subrahmanyan, Professor, New York University, United States

We study the problem of optimal inventory order timing when the selling price and demand are random and their forecasts improve with time. We derive the structure of the ordering policy and study the value of order timing flexibility.

073-0521 Score Auction Bidding Under Quality Uncertainty: Effort, Risk And Agency Considerations
Bernardo Quiroga, Assistant Professor, Clemson University, United States
Daniel Niembowicz, Student, Clemson University, United States

In a price-and-quality score procurement auction setting, we model the effect of quality uncertainty on bidding behavior under the presence of moral hazard, using a sealed-bid-first-score mechanism. In our scenario, bidders submit prices and target quality levels, and are subject to a failure-to-deliver penalty from deviations below said target.

073-0686 Importing and the Impact on Firm Operational Performance
Nitish Jain, Assistant Professor, London Business School, United Kingdom
William Schmidt, Assistant Professor, Cornell University, United States

Using a carefully constructed data set of company import activity, we show that importing from emerging markets decreases short-term operational performance and has no effect in the long term. This suggests that firms import for reasons other than cost reduction or are unable to achieve their cost reduction objectives.

073-0707 Ration Gaming and the Bullwhip Effect
Robert Bray, Associate Professor, Northwestern University, United States
Yuliang Yao, Associate Professor, Lehigh University, United States

We test whether ration gaming drives the bullwhip effect. We use a sample of data describing 73 Chinese supermarkets and their common upstream distribution center. We develop a structural econometric model of the supply chain.

073-1105 Pricing and Product Technology Choice with Reuse of Components
Jagan Jacob, Student, University of Rochester, United States
Harry Groenewelt, Associate Professor, University of Rochester, United States

We consider product technology and pricing decisions for next-generation of a product with potential reuse of components from used, previous generation products. Both monopoly and competitive scenarios are considered, and consumer upgrade and switching behaviour depend on prices and technology decisions made by the firm(s).
073-1021  Product Versioning and the Impact of Post-Sale Updates  
Michael Pangburn, Associate Professor, University of Oregon, United States  
Shubin Xu, Assistant Professor, Northeastern Illinois Univ, United States  
We consider a firm selling successive versions based on an evolving technology, and study the interrelated launch timing and pricing decisions as well as the impact of offering post-sale updates. We initially assume a homogeneous market but subsequently address heterogeneous consumers, employing a bounding strategy to derive near-optimal results.

073-0004  Optimal Pricing Strategy Under a Trade-In Program in the Presence of Strategic Consumer  
Jingchen Liu, Student, Peking University, China  
Lihua Chen, Professor, Guanghua School of Management, China  
Xin Zhai, Associate Professor, Peking University, China  
To encourage consumers’ repeated purchasing, many firms employ trade-in program. A firm can choose from dynamic pricing and preannounced pricing strategy to mitigate the strategic postponing behavior. We study the impact of the trade-in program and strategic consumer behavior on the firm’s optimal pricing strategy through a two-period game model.

073-0003  On the Interaction Between Product Rollover Strategy and Pricing Scheme  
Jingchen Liu, Student, Peking University, China  
Lihua Chen, Professor, Guanghua School of Management, China  
Xin Zhai, Associate Professor, Peking University, China  
When launching new products, firms use either single or dual rollover strategy. To increase profit, firms use either price skimming or penetration pricing scheme. We propose a two-period model incorporating market heterogeneity and consumers’ forward-looking behavior to study the interaction between rollover strategy and trade-in program under given pricing scheme.

073-2031  Establishing Trust and Trustworthiness in Global Supply Chains  
Ozalp Ozer, Professor, University of Texas Dallas, United States  
In this presentation, we will discuss the behavioral motives of trust and trustworthiness and how they arise to support business cooperation. We identify four building blocks of trust and trustworthiness: personal values and norms, market environment, business infrastructure, and business process design.

073-0072  Socially Responsible Value Chain Configurations  
Sudheer Gupta, Professor, Beedie School of Business, Canada  
How can value chains be configured to serve the needs of resource-constrained segments of society, especially in developing economies? We summarize lessons learned from a multi-year study of over 120 organizations across the world. We present a framework to better understand how organizations can combine social impact and financial returns.

073-0070  Cost Structures in Global Supply Chains and How to Fix Them  
Peter Letmathe, Professor, RWTH Aachen University, Germany  
Labor costs in the food and textile industries are unfavorably burdened with indirect costs, customs, taxes and profit margins. Final customers and other stakeholder groups perceive these allocation mechanisms as socially problematic. We analyze potential solutions with regard to the supply chain structure and cost allocation in developing countries.

073-0047  The Effects of Supply Chain Integration: The Impacts of Two Competing National Culture Frameworks  
Torsten Doering, Assistant Professor, University of Buffalo, United States  
Nallan Suresh, Professor, SUNY at Buffalo, United States  
Jurriaan de Jong, Assistant Professor, SUNY at Buffalo, United States  
Motivated by a benchmark study from a sample of companies who operate global supply chains, in this paper, we propose a comprehensive model framework for the global sourcing location decision process.
073-1525 Cancelability in Trade Credit Insurance
S. Alex Yang, Assistant Professor, London Business School, United Kingdom
Christopher Chen, Student, London Business School, United Kingdom
Nitin Bakshi, Associate Professor, University of Utah, United States
We study the interaction between a supplier and a trade credit insurer. We show that the unique contract forms in trade credit insurance is due to the insurer’s active risk monitoring role. Both cancelable and non-cancelable contracts can be optimal under this role.

073-0024 How can Inventory Management Strategies be Used to Reduce Food Waste?
Alexandra Heeney, Student, Stanford University, United States
Warren Hausman, Professor, Stanford University, United States
Erica Plambeck, Professor, Stanford University, United States
Worldwide, 30-40% of food is wasted, and in North America, most of this occurs at the retail and consumer level. We explore how improving ordering and disposal policies can reduce food waste and how to design environmental policies that incentivize food waste reduction in the supply chain.

073-1287 Replenishment Policies That Anticipate Consumer Shopping Patterns to Minimise In-Store Food Waste
Emel Aktaş, Senior Lecturer, Cranfield University, United Kingdom
Akunna Oledinma, Lecturer, Cranfield University, United Kingdom
Zeynep Topaloglu, Assistant Professor, Georgetown University, Qatar
Zahir Irani, Professor, Brunel University, United Kingdom
Amir Sharif, Professor, Brunel University, United Kingdom
Consumers are strategic in their grocery shopping, looking for the freshest items when it comes to fruits and vegetables. We study replenishment policies that anticipate consumers’ shopping patterns to minimise in-store food waste due to expiration while considering out-of-stock situations. Our empirically-informed experiments suggest retailers to monitor item-level expiry dates.

073-0945 Shipment Policies in Two-Tier Supply Chains for Perishable Products
Arzum Akkas, Professor, Boston University, United States
Dorothee Honhon, Associate Professor, University of Texas Dallas, United States
In this research, we investigate optimum shipment policies for a manufacturer that compensates the retailer for the return of expired items. We evaluate different scenarios with regards to the shelf rotation methods practiced on the store shelf as well as the information provided by the retailer.

073-0572 Agent-based Simulation of Inter-Organizational Communication Media Options in Centralized Disaster Response Coordination
Susan Heath, Assistant Professor, Naval Postgraduate School, United States
Deborah Gibbons, Associate Professor, Naval Postgraduate School, United States
Large-scale disaster response operations necessitate effective inter-organizational coordination, often leveraging various communication media. We investigated communication media options via interviews, observations of a large-scale FEMA exercise, and a related agent-based simulation model that tested effects of varying access to WebEOC, email, phones, and face-to-face media. Results inform guidelines for practice.

073-1452 Agent-Based Modeling of Internal Information Management Support for Humanitarian Organizations
Lauren Bateman, Student, George Washington University, United States
Erica Gralla, Assistant Professor, George Washington University, United States
This paper uses agent-based modeling to explore what features of an internal information management team affects the speed of task accomplishment of a humanitarian organization’s deployed team. It also asks under what circumstances an IM team is most effective, or not at all, in assisting implementing teams.

073-1652 Explaining the Interactions and Adaptation of Humanitarian Organizations in Relief Operations
Sebastian Villa, Assistant Professor, Universidad de los Andes, Colombia
Luisa Fernanda Diaz-Echavarria, Professor, Instituto Tecnológico Metropolitano, Colombia
Gloria Urrea, Student, University of Lugano, Switzerland
This research explains the interactions and adaptation of humanitarian organizations in relief operations.
When a disaster occurs, humanitarian organizations interact with multiple agents while they adapt based on the environment and population needs. We develop an Agent-Based Model to understand the emergence of collaborative and coordinated behavior in relief operations. We analyze the effect of partnerships, own vs. general interest, and information sharing.

**Friday, 04:30 PM - 06:00 PM**

**Track: Humanitarian Operations and Crisis Management**

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<th>Session</th>
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<tr>
<td>073-1400</td>
<td>An Integrated Facility Location And Network Restoration Model Under Repair Time Uncertainty</td>
<td>Ece Sanci, Student, University of Michigan - Ann Arbor, United States&lt;br&gt;Mark Daskin, Professor, University of Michigan - Ann Arbor, United States</td>
</tr>
<tr>
<td>073-1457</td>
<td>Optimal Planting Schedule Under Weather Uncertainty</td>
<td>Jayashankar Swaminathan, Professor, University of North Carolina, United States&lt;br&gt;Ying Zhang, Student, University of North Carolina Chapel Hill, United States</td>
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<tr>
<td>073-0141</td>
<td>Supply Chain Performance Management Practices in Humanitarian Organizations</td>
<td>Hella Abidi, Student, Vrije Universiteit Amsterdam, Netherlands</td>
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**Session: Environmental Strategies**

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<tr>
<td>073-0035</td>
<td>Operational Response to Climate Change: Do Profitable Carbon Abatement Opportunities Decrease Over Time?</td>
<td>Christian Blanco, Student, University of California Los Angeles, United States&lt;br&gt;Felipe Caro, Associate Professor, University of California Los Angeles, United States&lt;br&gt;Charles Corbett, Professor, University of California Los Angeles, United States</td>
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<tr>
<td>073-0122</td>
<td>Product Geographical Distribution Under Recall Risk</td>
<td>Long He, Assistant Professor, National University of Singapore, Singapore&lt;br&gt;Ying Rong, Associate Professor, Shanghai Jiao Tong University, China&lt;br&gt;Max Shen, Professor, University of California Berkeley, United States</td>
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**Track: Environmental Operations Management**

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<td>073-1039</td>
<td>Closing A Supplier's Energy Efficiency Gap: The Role Of Assessment Assistance And Procurement Commitment</td>
<td>Jason Quang Nguyen, Student, University of Minnesota, United States&lt;br&gt;Karen Donohue, Associate Professor, University of Minnesota, United States&lt;br&gt;Mili Mehrotra, Assistant Professor, University of Minnesota, United States</td>
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<tr>
<td>073-0159</td>
<td>Explaining Heterogeneity in Environmental Practice Adoption: A Multi-Level Approach</td>
<td>Rick Hardcopf, Student, University of Minnesota, United States&lt;br&gt;Rachna Shah, Associate Professor, University of Minnesota, United States&lt;br&gt;Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States</td>
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**Session: Environmental Management Practices**

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<th>Session</th>
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<tr>
<td>073-0811</td>
<td>The Relationship of Environmental Management Capability and Financial Performance: Evidence from China, USA and Vietnam</td>
<td>Hung Nguyen, Lecturer, Rmit University, Vietnam&lt;br&gt;Norma Harrison, Professor, Macquarie University, Australia</td>
</tr>
</tbody>
</table>
Evidence from the manufacturers proved that firms located in emerging economies placed the strongest effort in, and gained the most from, implementing environmental management capability, relative to other economies. The study provides implications to managers stressing the need to adapt to different economic conditions and to deploy resources effectively.

- **073-0269** Measuring the Performance of Corporate Biodiversity Management Using Fuzzy Logic
  - Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
  - Juan Camilo Serpa, Assistant Professor, Mcgill University, Canada
  - Vicente Faccenda, Assistant Professor, Baruch College, United States
  - Pierre Fannes, Professor, Université Paris Ouest Nanterre La Défense, France
  - Nicolas Mainetti, Professor, Université d’Auvergne, France

  Five key performance indicators and twenty sub-indicators in the measurement model have been confirmed by specialists including academic experts and practitioners. The empirical results indicate that companies perform better on indicators Biodiversity Business Assessment and Biodiversity Stewardship Practices than on Biodiversity Conservation Commitment, Biodiversity Management Policy and Biodiversity Performance Reporting.

- **073-0420** Too Long or Very Quick: Chinese Automotive Parts Manufacturers' Perspective on Sustainability Benefits Realization
  - Lin Wu, Lecturer, The Sino-British College, USST, China
  - Nachiappan Subramanian, Reader, University of Sussex, United Kingdom
  - Muhammad Abdulrahman, Associate Professor, University of Nottingham Ningbo China, China
  - Chang Liu, Associate Professor, Nottingham University, China
  - Kul Pawar, Professor, University of Nottingham, United Kingdom

  Time dimension in the concept of sustainability has been largely overlooked in empirical studies. We develop and empirically validate a two-dimensional sustainability framework that incorporates both short- and long-term sustainability practices. Evidence based on 284 responses reveals that lean and green practices have positive effects on both short- and long-term.

- **073-0534** Green Sourcing-The Role of Premium Sharing and Consulting Services
  - Xi Chen, Assistant Professor, University of Michigan Dearborn, United States
  - Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore
  - Saif Benjaafar, Professor, University of Minnesota, United States

  Certified sustainable products often times enjoy a significant green premium in the retail market. In this paper, we study a retailer's use of premium sharing and consulting service offers to incentivize suppliers to exert greening efforts which improves the chances of receiving certification, and in turn captures the green premium.

- **073-1352** The Impact of Product Design on CLSC Coordination: Input Material Reduction Incentives vs. Enhanced Recycling
  - Tolga Aydinliyim, Assistant Professor, Baruch College, United States
  - Eren Cil, Assistant Professor, University of Oregon, United States
  - Nagesh Murthy, Associate Professor, University of Oregon, United States

  We consider a setting wherein a buyer procures standard-sized forgings from a supplier, and performs machining, which yields final components and significant scrap. Adopting a principal-agent framework, we investigate coordination implications while accounting for potential information asymmetry issues, and find that improved recycling may or may not mitigate decentralization cost.

- **073-1347** Extended Warranties and Secondary Market Strategies
  - Wayne Fu, Student, Georgia Institute of Technology, United States
  - Atalay Atasu, Associate Professor, Georgia Institute of Technology, United States
  - Necatı Tereyagülü, Assistant Professor, Georgia Institute of Technology, United States

  We examine the impact of product warranty extensions in a durable good market. Considering that the product fails at a certain rate, we show that the producer’s warranty extension choice is surprisingly non-monotonic in the failure rate and that the producer’s secondary market interference through buyback programs has significant implications.

- **073-1156** Fast And Furious? The Impact Of Delivery Lead Times in Online Buyer Behaviour
  - Eduard Calvo, Associate Professor, IE E S E, Spain
  - Victor Martinez-de-Albeniz, Professor, IE E S E, Spain
  - Alex Thiele, Student, IE E S E, Spain

  Many e-commerce firms reduce delivery lead-times to make online buyers ”happier” and, hopefully, more likely to buy more. We leverage user and click-level massive data from an online retailer to validate this hypothesis. For this, we study the effect of delivery lead-times in traffic, conversion rates, and purchasing probabilities.

- **073-1731** Supply Chain Partner Environmental Health and Firm Performance
  - Marcus Bellamy, Assistant Professor, Boston University, United States

  We empirically examine the relationship between the environmental initiatives and outcomes of a firm’s supply chain partners and firm performance. We draw from environmental, financial, and supply chain data to identify key mechanisms related to the environmental health of a firm’s supply chain that influence its economic performance.

- **073-0174** Oversight and Efficiency in Public Projects: A Regression Discontinuity Design
  - Juan Camilo Serpa, Assistant Professor, Mcgill University, Canada
  - Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
**Friday, 04:30 PM - 06:00 PM**

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<tr>
<th>Session: Influencing Behavior in Operations</th>
<th>Track: Behavior in Operations Management</th>
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<td>Chair(s): John Aloysius</td>
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<td>073-1664 Profit-Sharing or Target-with-Bonus? A Behavioral Investigation</td>
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<td>Kay yut Chen, Professor, University of Texas Arlington, United States</td>
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<td>Shan Li, Assistant Professor, Baruch College, United States</td>
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<td>Ying Rong, Associate Professor, Shanghai Jiao Tong University, China</td>
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<td>We theoretically and behaviorally studied profit-sharing and target-with-bonus employee compensation plans in an operational setting. We compared the performances of each compensation plan, identified behavioral causes and suggested mix plan as a remedy that beats both plans.</td>
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<td>073-1144 Heterogeneity of Reference Points in the Competitive Newsvendor Problem</td>
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<tr>
<td>Sam Kirshner, Lecturer, University of New South Wales, Australia</td>
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<tr>
<td>Anton Ovchinnikov, Associate Professor, Queens University, Canada</td>
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<td>This paper incorporates the recently-proposed optimism-based reference point formulation into a competitive newsvendor model. The analysis shows that the heterogeneity of newsvendors' reference points can explain several regularities observed in recent experimental studies of newsvendor competition.</td>
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<td>073-1726 Managing False Failure Returns With Coordination</td>
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<td>Brent Moritz, Assistant Professor, Penn State University University Park, United States</td>
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<td>Yue Cheng, Student, Penn State University University Park, United States</td>
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<td>V.D.R. Guide, Professor, Penn State University University Park, United States</td>
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<td>Non-defective (false failure) items returned by consumers are costly for manufacturers, yet minimizing them requires retailer effort. Coordinating contracts within a channel is difficult due to behavioral factors. We extend the model, demonstrate several behavioral biases, and offer suggestions to reduce returns, resulting in improved channel profits and sustainability.</td>
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<td>073-1737 Pilot Motivation for Fuel Savings</td>
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<td>Kenneth Schultz, Professor, Air Force Institute of Technology, United States</td>
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<td>Safety and mission accomplishment will always be the top priorities for pilots. We motivate this fuel savings through goals without organizational rewards or punishments. Using survey and flight data from USAF transport pilots we measure how goals can create intrinsic (autonomous) motivation.</td>
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**Empirical Research in Operations Management**

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<td>Chair(s): Yannis Stamatiopoulos</td>
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<tr>
<td>073-0028 Maximizing Profitability in Online Retail Through a Free Shipping Threshold Policy</td>
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<tr>
<td>Gerard Cachon, Professor, University of Pennsylvania, United States</td>
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<tr>
<td>Santiago Gallino, Assistant Professor, Dartmouth College, United States</td>
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<td>Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States</td>
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<td>We develop models of customer response to the presence of a free shipping threshold using data from a large online retailer. The model is used to demonstrate the outer size of free shipping threshold on profit. We also offer recommendation on when a free shipping threshold is effective for retailers.</td>
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<td>073-0202 Optimizing SKU Selection for Promotional Display Space at Grocery Retailers</td>
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<td>Olga Pak, Student, University of South Carolina, United States</td>
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<td>Mark Ferguson, Professor, University of South Carolina, United States</td>
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<td>Olga Perdikaki, Assistant Professor, University of South Carolina, United States</td>
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<td>Su-Ming Wu, Functional Architect, Oracle, United States</td>
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<td>Promotional displays are a powerful tool to boost consumer engagement. We propose a multi-step methodology to identify a profit-maximizing selection of products for promotional display using grocery store sales transaction data. Our methodology results in a 5% to 23% improvement in profit when compared to an industry benchmark.</td>
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<td>073-0917 Estimating Substitution and Basket Effects in Retail Stores</td>
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<tr>
<td>Vidya Mani, Assistant Professor, Penn State University University Park, United States</td>
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<td>Doug Thomas, Professor, Penn State University University Park, United States</td>
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<td>Saurabh Bansal, Assistant Professor, Penn State University University Park, United States</td>
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<td>We develop a model to estimate both substitution and basket effects. Using data from an office supplies retailer, we show how these estimates can be used to make assortment decisions. Counterfactual experiments show that incorporating basket effects can significantly improve sales at the these retail stores.</td>
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<td>073-1351 How Local Economic Factors Affect the Liquidation Value of Retail Inventory</td>
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<td>Nathan Craig, Assistant Professor, Ohio State University, United States</td>
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<td>Ananth Raman, Professor, Harvard University, United States</td>
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<td>The liquidation value of retail inventory affects the decisions of managers and investors. We analyze outcomes of inventory liquidations via proprietary data on 2,000 liquidations involving 31 retailers and $4B of inventory. Using detailed economic data at the zip code level, we identify local factors that significantly impact inventory liquidation.</td>
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</table>
### Managing The Dynamics Of Delegated Search

**Authors:**
- Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States
- Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States

We study the dynamics of delegated search and identify conditions under which the client should use a committed or open-ended search structures.

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<tbody>
<tr>
<td><strong>073-0896</strong> Privacy Preservation Techniques for Shared Distributed Transactional Databases</td>
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</tbody>
</table>
| Abhijeet Ghoshal, Assistant Professor, University of Louisville, United States  
Syam Menon, Associate Professor, University of Texas Dallas, United States  
Sumit Sarkar, Professor, University of Texas Dallas, United States |  |

We present Integer Programming based approaches to maximize the accuracy of shared Point-of-Sales databases while hiding sensitive information at global and local levels. We show the effectiveness of the approaches on several databases, and also demonstrate that the sanitized database can be used for recommendations as effectively as unsanitized database.

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<th>Session: Managing Innovation and Product Development</th>
<th>Track: Product Innovation and Technology Management</th>
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<td><strong>073-0238</strong> A Behavioral Study on Abandonment Decisions in Multi-Stage Projects</td>
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</table>
| Xiaoyang Long, Student, Hong Kong University of Science & Tech, Hong Kong  
Javad Nasiry, Assistant Professor, Hong Kong University of Science & Tech, Hong Kong  
Yaozhong Wu, Associate Professor, National University of Singapore, Singapore |  |

We study abandonment decisions in a multi-stage project setting. Our experiments show that project managers tend to delay abandonment decisions and their decisions are highly path dependent. We develop a model that incorporates behavioral factors to explain our observations.

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<td><strong>073-0280</strong> Lone Inventor vs. Team of Inventors: What’s Best?</td>
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</table>
| Tian Chan, Assistant Professor, Emory University, United States  
Jurgen Mihm, Associate Professor, INSEAD, France  
Manuel Sosa, Associate Professor, INSEAD, Singapore |  |

Using patents, we compare the effects of working alone (vs. teams) on the probability of creating breakthrough inventions. Working alone lowers performance, consistent with literature. But we also find that this performance disadvantage disappears for design. We find empirical support that the difference is due to the integrality of design.

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<tr>
<td><strong>073-007</strong> Concepts and Foundations of Information Security Based on ISO/IEC NBR 27000</td>
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</table>
| Marcelo Fernandes, Professor, Universidade Nove de Julho, Brazil  
Oduvaldo Vendrametto, Professor, Universidade Paulista - Unip, Brazil  
Marcelo Okano, Professor, CEEEPS, Brazil  
Juliano Schimiguel, Professor, Universidade Cruzeiro do Sul, Brazil  
Wellington Dias, Professor, Universidade Nove de Julho, Brazil |  |

The focus of this paper is to present a brief and objective way some concepts related to information security. In this context will be discussed the theme of ISO/IEC NBR 27000 family, which consists in explanation and definitions of terms linked to information security.

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<td><strong>073-009</strong> ISO /IEC 38500 IT Governance</td>
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</table>
| Marcelo Fernandes, Professor, Universidade Nove de Julho, Brazil  
Oduvaldo Vendrametto, Professor, Universidade Paulista - Unip, Brazil  
Marcelo Okano, Professor, CEEEPS, Brazil  
Juliano Schimiguel, Professor, Universidade Cruzeiro do Sul, Brazil  
Osmildo Santos, Professor, Universidade Potiguar, Brazil |  |

The present article presents the definition of ISO/IEC 38500, which applies to governance TI, which will be shown the contents of the standard and its objectives. The work motivation came by the need to understand how the standard 38500 and how it helps organizations achieve higher performance on the market.

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<tr>
<td><strong>073-0673</strong> Necessity Is the Mother of Invention (For Some People)</td>
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</table>
| Sanjiv Erat, Associate Professor, University of California San Diego, United States  
Giorgi Jvarsheishvili, Student, ??????, Germany |  |

We offer evidence that the effect of constraints is more subtle than what the epigram would suggest - low expertise people are hurt by constraints by preventing idea buildup, whereas high expertise people are helped by constraints as it quickly moves them away from low to high quality ideas.

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<tr>
<td><strong>073-0653</strong> Managing The Dynamics Of Delegated Search</td>
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</table>
| Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States  
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States |  |

Firms often delegate search for solutions to challenges such as product design, advertisement creation, executive search, etc. We study the dynamics of delegated search and identify conditions under which the client should use a committed or open-ended search structures.
Friday, 04:30 PM - 06:00 PM

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Session: Online Information Sharing, Security and Portfolio Management Analytics
Chair(s): Terence Saldanha

073-1414 Conceptual Framework for Analyzing Security Issues in Analytics and Big Data in Cloud
Arti Mann, Assistant Professor, University of Houston Clear Lake, United States
Priyanka Shah, Student, University of Houston Clear Lake, United States

Business Intelligence (BI) in cloud, is an evolving trend in cloud computing. BI in cloud provides scale and scope economies but security and related issues hinder the implementation of this model. We identify security issues in implementation of BI in Cloud and propose a conceptual model to address these issues.

073-1519 Affective News Dimensions and Online Sharing: Evidence From Mashable
Abdullah Alnuaim, Student, University of Colorado Denver, United States
Jiban Khuntia, Assistant Professor, University of Colorado Denver, United States
Dobin Yim, Assistant Professor, Fordham University, United States

News popularity in social networks determines media production success. We explore how affective dimensions, such as polarity, subjectivity and visual appeal, influence sharing of 40,000 news articles. Image intensity complements text and title subjectivity, Image appeal complements title subjectivity, but has a substitution effect on text subjectivity. Implications are discussed.

073-1212 Competition Networks, Information Management Capability (IMC) and Firm Resources
Mariana Giovanna Andrade Rojas, Assistant Professor, Nanyang Technological University, Singapore
Abhishek Kathuria, Assistant Professor, The University of Hong Kong, Hong Kong
Ali Farhoomand, Professor, The University of Hong Kong, Hong Kong

In this study, we investigate how IT-enabled IMC complements firm resources in the attainment of a brokerage position in competition networks. We analyze the effects of this complementarity on firms’ information flows and competition. We test our hypothesis in an 8-year longitudinal competition network that extends across 11 different industries.

073-1764 Portfolio Management for Private Equity Firms through IT Orientation and Portfolio Embeddness
Bidut Hazarika, Assistant Professor, Western Michigan University, United States
Abhishek Kathuria, Assistant Professor, The University of Hong Kong, Hong Kong
Jiban Khuntia, Assistant Professor, University of Colorado Denver, United States
Terence Saldanha, Assistant Professor, Washington State University Pullman, United States
Mariana Giovanna Andrade Rojas, Assistant Professor, Nanyang Technological University, Singapore

Private equity firms face the challenge of positioning their portfolio firms on the road to success. We posit that portfolio-embeddedness and IT-orientation (based on the recommendation of the PE firms) would influence portfolio firm performance. We focus on three dimensions: customer, efficiency, and supplier IT orientations.

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Session: Project Scheduling, School Timetabling, and Manpower Planning
Chair(s): Norbert Trautmann

073-0031 Course Scheduling Optimization at NYIT School of Management
Shaya Sheikh, Assistant Professor, New York Institute of Technology, United States

We present a stochastic course scheduling model that addresses NYIT’s priorities such as minimizing course conflicts, constraining use of adjunct faculty, constraining number of course preparations and number of days each faculty teaches. The optimal solution suggests the optimal mix of courses with minimum coverage of 97%.

073-0816 B-School Examination Timetabling under Heterogeneous Elective Selections
Godwin T, Associate Professor, IIM Tiruchirappalli, India

B-schools allow each student to independently select required number of electives from a larger pool, resulting in heterogeneous elective selection combinations across students and making it challenging to arrive at a quality examination timetable. A mathematical program in conjunction with a surrogacy approach is proposed to obtain quality examination timetable.

073-1296 An RCPSP-Based Heuristic for the Short-Term Planning of Assessment Centers
Norbert Trautmann, Professor, University of Bern, Switzerland
Adrian Zimmermann, Student, University of Bern, Switzerland

During an assessment center, assessors evaluate how individual candidates for a job position execute a prescribed set of tasks. We present an RCPSP-based heuristic for assigning start times and assessors to the execution of these tasks such that the assessment-center duration is minimized and some complex organizational constraints are fulfilled.

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Session: Revenue management with customer choice behavior
Chair(s): Selvaprabu Nadarajah

073-0239 Joint Pricing and Inventory Management With Strategic Customers
Yiwei Chen, Assistant Professor, Singapore University of Technology and Design, Singapore
Cong Shi, Assistant Professor, University of Michigan, United States

We consider a joint pricing and inventory problem. Customers are forward-looking, who strategize their times of purchases. Customer unsatisfied demand is backlogged. We show that a cyclic policy is optimal. In equilibrium, every strategic customer behaves myopically. The seller's optimal profit equals her optimal profit in a myopic customer setting.
073-0684  Dynamic Inventory Control With Stockout Substitution And Demand Learning  
Boxiao Chen, Assistant Professor, University of Illinois Chicago, United States  
Xiuli Chao, Professor, University of Michigan Ann Arbor, United States  
Stock-out substitution is the phenomenon that if the primary choice of a customer is out of stock, besides leaving the market immediately, the customer may also substitute for other products. In this paper, we study a data-driven inventory management problem and infer the customer substitution behavior from historical sales data.

073-0178  Product-Line Pricing Under Discrete Mixed Multinomial Logit Demand  
Hongmin Li, Associate Professor, Arizona State University Tempe, United States  
Scott Webster, Professor, Arizona State University Tempe, United States  
Nicholas Mason, Engineer, Intel Corporation, United States  
Karl Kempf, Fellow, Intel Corporation, United States  
We study a product-line price optimization problem with demand given by a discrete mixed multinomial logit (MMNL) model, which models a market with multiple customer segments. We apply the model to microprocessors and show that the optimal prices exploit segment differences through redistribution of sales and profit among customers.

073-0865  New Bounds for Assortment Optimization Under The Nested Logit Model  
Huseyin Topaloglu, Associate Professor, Cornell University, United States  
Sumit Kunnumkal, Assistant Professor, Queens University, Canada  
We consider the assortment optimization problem under the nested logit choice model. We establish new bounds on the performance of revenue ordered assortments.

073-0416  Flexible Market Response Model with Price-Dependent Heteroscedasticity  
Sirog Luo, Associate Professor, Shanghai Univ. of Finance and Economics, China  
Suresh Sethi, Professor, University of Texas Dallas, United States  
Haipeng Shen, Professor, The University of Hong Kong, United States  
Jun Zhang, Professor, Fudan University, China  
This paper proposes a flexible market response model in which the distribution of log-demand belongs to a location-scale family and the location and scale functions are price dependent. The nonlinear and irregular shapes of the price-demand relationship are modeled by using regression splines. We analyze the unimodality of newsvenor-pricing model.

073-0744  Outsourcing with Learning-by-Doing  
Min Wang, Assistant Professor, Drexel University, United States  
Wenjing Shen, Associate Professor, Drexel University, United States  
We consider two OEMs outsourcing to a single powerful CM, and all parties may learn from production to reduce future cost. We show that even if the two OEMs do not compete with each other, the presence of another OEM can have a significant impact on the outsourcing strategy.

073-1053  Dynamic Coordination in a Supply Chain with Production Capacity Uncertainty  
Qi Feng, Professor, Purdue University, United States  
Zhongjie Ma, Student, Purdue University, United States  
George Shanthikumar, Professor, Purdue University, United States  
We study the effect of upstream supply uncertainty on the inventory decisions in a two-stage supply chain from both centralized and decentralized perspectives. We show that the centralized problem is concave via transformation. Furthermore, we discuss the mechanism to coordinate the dynamic decisions under limited information visibility.

073-0766  Product-Return-Based Price Discrimination and Return Policies  
Lan Wang, Assistant Professor, California State University East Bay, United States  
Hong Guo, Associate Professor, University of Notre Dame, United States  
Xuying Zhao, Associate Professor, University of Notre Dame, United States  
Guangzhi Shang, Assistant Professor, Florida State University, United States  
This paper demonstrates that consumers' product return behavior can serve as a basis for price discrimination. We analyze this new form of price discrimination. We also explore interactions between product-return-based price discrimination and return policies. Our results show that product-return-based price discrimination is an effective mechanism to improve firms' profits.

073-0949  A Study on a Joint Distribution Model of Vegetable Corner Stores  
yan zhao, Professor, Capital University of Economics and Business, China  
guqian peng, Assistant Professor, Capital University of Economics and Business, China  
This paper presents a mathematical model of the joint distribution. 5 distribution centers and 126 vegetable corner stores in Beijing are surveyed. The optimal scheme is obtained by genetic algorithm with MATLAB. We also compares the processes, costs and social benefits before and after the adoption of the optimal scheme.

073-1262  Food Labeling and Product Quality  
Jill Maher, Professor, Robert Morris University, United States
Friday, 04:30 PM - 06:00 PM

073-0192  Queue now or Queue Later: An Empirical Study of Callers’ Redial Behaviors
Brett Hathaway, Student, University of North Carolina Chapel Hill, United States
Seyed Emadi, Assistant Professor, University of North Carolina Chapel Hill, United States
Vinayak Deshpande, Professor, University of North Carolina Chapel Hill, United States

We perform an empirical study of callers' redial behaviors using data from a commercial banking call center. We show that callers' abandonment and redial decisions depend on their past interactions with the call center. We formulate and estimate the parameters of a structural model of callers' abandonment and redial decisions.

073-0853  Pooling Queues with Discretionary Service Capacity
Mor Armony, Associate Professor, New York University, United States
Guillaume Roels, Associate Professor, University of California Los Angeles, United States
Hummy Song, Assistant Professor, The Wharton School, United States

Contrary to traditional queuing theory, recent case studies indicate that pooling queues may not necessarily result in less expected work in process. We develop a game-theoretic model that proposes that this may arise when servers have some discretion over their choice of service capacity and are work averse.

073-0223  Learning From Inventory Availability Information: Field Evidence From Amazon
Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
Dennis Zhang, Student, Northwestern University, United States
Achal Bassamboo, Associate Professor, Northwestern University Kellogg School o, United States

Based on a unique setting from Amazon lightning deals, which displays the percentage of inventory consumed, we explore whether and how consumers learn from inventory availability information. We address this issue by running a randomized field experiment on Amazon. In addition, we run a panel data analysis.

073-0768  Understanding Customer-Induced Negative Externalities in Congested Self-Service Environments
Hyon Seok Lee, Student, University of North Carolina Chapel Hill, United States
Saravanan Kesavan, Associate Professor, University of North Carolina Chapel Hill, United States
Vinayak Deshpande, Professor, University of North Carolina Chapel Hill, United States

We identify a new phenomenon called thwarting behavior, defined as systematic change in customers' behavior when they experience congestion that imposes negative externalities on other customers, that occurs in self-service environments of retail stores. With this, we examine the impact of congestion in fitting rooms on store performance.

073-0799  Task-Specific Team Familiarity and Team Performance
Murat Uнал, Student, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States
Necati Tereyagoglu, Assistant Professor, Georgia Institute of Technology, United States

Using an extensive dataset on work history of contributors to creative projects in an industry, we study the relationship between the project performance and the team members' past interactions. We find that the effect of prior relationships on project performance can differ based on the nature of the task.

073-1802  Welfare Implications of Congestion Pricing: Evidence from SFpark
Pnina Feldman, Assistant Professor, University of California Berkeley, United States
Friday, 04:30 PM - 06:00 PM

Chair(s): Fernanda Bravo

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Friday, 04:30 PM - 06:00 PM, Larch

Session: Healthcare operations

Track: Manufacturing Operations

073-0540 Integrated Scheduling of Anesthesiologist and Operating Rooms to Surgeries

Sandeep Rath, Assistant Professor, University of North Carolina Chapel Hill, United States
Kumar Rajaram, Professor, University of California Los Angeles, United States

We consider the problem of scheduling anesthesiologists and operating rooms to surgeries. We model this problem as a large scale stochastic dynamic program with integer variables. We solve this problem using robust optimization and implement the solution at the UCLA Medical Center, leading to significant daily cost reduction.

073-0621 Delayed Arrivals in Emergency Care

Fredrik Eng-Larsson, Assistant Professor, Stockholm Business School, Sweden
Olov Isaksson, Assistant Professor, Stockholm Business School, Sweden

Patient arrivals to the ED are typically very volatile, making it difficult to match capacity with demand. Using structural estimation techniques we investigate how patient preferences influence the choice of when to visit the ED. We show how insights about these preference parameters can be used to improve system performance.

073-0668 Real-Time Assignment of Inpatients to Care Teams and Beds

Aleida Braaksm, Student, Massachusetts Institute of Technology, United States
Elizabeth Ugargph, Student, Massachusetts Institute of Technology, United States
Rhodes Berube, Administrative Director for Clinical Operations, Massachusetts General Hospital, United States
Ana Cecilia Zenteno Langle, Operations Research Manager, Massachusetts General Hospital, United States
Retsef Levi, Professor, Massachusetts Institute of Technology, United States

Alongside a major redesign in the Department of Medicine at Massachusetts General Hospital, we provide decision support for patient flow optimization. We develop algorithms for real-time assignment of patients to care teams and beds, aiming at shortening patient wait times, and decreasing Emergency Department load.

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Friday, 04:30 PM - 06:00 PM, Madrona

Session: Pricing and Operational Decisions

Track: Economic Models in Operations Management

073-0042 Dynamic Speeds of Partial Adjustment of Actual Toward Desired CEO Compensation

Winston Lin, Professor, SUNY At Buffalo, United States
Chia-Ching Chou, Student, SUNY At Buffalo, United States

Using a panel dataset, we propose to apply the partial adjustment (PA) valuation approach (Lin and Kao, 2014) in which the speed of partial adjustment is dynamic and variable to empirically investigating the speed of partial adjustment of actual (observed) CEO compensations towards desired (maximum) CEO compensations.

073-0479 Pricing and Location Competition in the Unbalanced Linear City

Shuxiao Sun, Student, Peking University, China
Xiaona Zheng, Associate Professor, Peking University, China

This paper investigates firms’ location-price competition along the Hotelling linear city when consumers are distributed asymmetrically. We also examine the case when firms’ location choice region is arbitrarily constrained along the infinite line. We find that the maximum and minimum differentiation principle may arise under different conditions.

073-0512 Routines Synapses Mechanisms: The Interplay Between Dynamic And Operational Capabilities

Carlos Usirono, Student, Fundacao Getulio Vargas, Brazil
Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil

This study examines the integration between dynamic and operational capabilities and the implications it has in operations management. Corporate, capability, and routine levels are discussed considering possible inhibitors and enablers of the integration process. It closes with a theoretical model that can be applied by managers to optimize their operations.

073-1338 Dependence Among Brazilian Real Estate Assets, Overall Market and Country Risk: A Copula Approach

Anderson Amorin, Student, URI/ UFRGS, Brazil
Andreas Weise, Professor, Federal University of Santa Maria, Brazil
Francisco Kliemann Neto, Professor, Federal University of Rio Grande do Sul, Brazil
Joana De Souza, Professor, Federal University of Rio Grande do Sul, Brazil
Ricardo Correa, Student, Federal University of Rio Grande do Sul, Brazil

We perform an investigation about dependence among Brazilian real estate assets, overall market, and country risk to observe if political instability influences dependence trough assets. To accomplish this we identify the best pair copula for each combination. We found that the stronger dependence is between Ibovespa and country risk.

073-1471 An Analysis of Menus of Multi-Part Tariffs

Ryan Choi, Assistant Professor, Eastern Michigan University, United States
Taewan Kim, Assistant Professor, Lehigh University, United States
We study which characteristics of three-part tariffs (3PTs) generate greater profit than two-part tariffs and examine the optimal values of 3PTs. Under an assumption of consumer heterogeneity and a full extraction of low type segment’s surplus, the seller can extract more of high type surpluses.

152 Friday, 04:30 PM - 06:00 PM, Bellevue Place Boardroom
Session: Topics in Inventory Management Track: Inventory Management
Chair(s): Ali Fattahi

073-0992 Inventory Management in the Presence of Product Substitution: An Experimental Study
Dina Ribbink, Assistant Professor, University of Western Ontario, Canada
Heidi Celebi, Student, Georgia Southern University, United States

In this study, we compare inventory management decisions in the presence of attribute versus stock-out based product substitution. In addition, we discuss different degrees of customer willingness to substitute. Based on our findings, we derive managerial implications for inventory stocking guidelines.

073-1533 Is the Upper-Semi Variance Better Than the Variance for Setting Safety Stocks?
John Saldanha, Assistant Professor, West Virginia University, United States
Darryl Ahner, Associate Professor, Air Force Institute of Technology, United States
Peter Swan, Associate Professor, Penn State Harrisburg, United States

We investigate the efficacy of using the upper semi-variance (USV) instead of the variance for setting safety stocks when assuming a normally distributed lead time demand (LTD). The USV is easily calculated, and is an unbiased and efficient estimator that better accounts for the right skew of the LTD distribution.

073-0375 Comparison of Risk Neutral and Heuristic Policies in the Risk Averse Newsvendor Problem
Hossein Najmi, Student, University of North Texas, United States
Heng Xie, Student, University of North Texas, United States
Shailesh Kulkarni, Professor, University of North Texas, United States

We compare newsvendor order levels based upon a simple heuristic rule (the ignorant newsvendor) versus a risk-neutral newsvendor fractile when the actual propensity of the decision-maker is risk-averse. We find that the risk-neutral order quantity may actually be worse than the heuristic order quantity in such situations.

073-1803 Peak Load Energy Management by Direct Load Control Contracts
Ali Fattahi, Student, University of California Los Angeles, United States
Sriram Dasu, Associate Professor, University of Southern California, United States
Reza Ahmadi, Professor, University of California Los Angeles, United States

Energy firms use direct load control contracts to curtail electricity consumption during peak load periods. The question is: when and which groups of customers should reduce their energy consumption, and for how long? We develop a near-optimum heuristic procedure and show that the asymptotic relative error is zero.
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<td>073-1409 Provider Selection Framework for Bundled Payments in Healthcare</td>
<td>Seokjuan Youn, Student; Anupam Agrawal, Associate Professor; Subodha Kumar, Professor; Chelliah Sriskandarajah, Professor</td>
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<td>073-1409 Provider Selection Framework for Bundled Payments in Healthcare</td>
<td>Chair(s): Mehmet Ayvaci, Turgay Ayer</td>
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<td>073-1562 Incentive Programs for Reducing Readmissions When Patient Care Is Co-Produced</td>
<td>Dimitrios Andritsos, Assistant Professor; Christopher Tang, Professor</td>
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<td>073-1511 Alternative Payment Models, Incentives For Adoption and Value of Health-Information Exchanges (HIEs)</td>
<td>Mehmet Ayvaci, Assistant Professor; Huseyin Cavusoglu, Associate Professor; Yeongin Kim, Student; Srinivasan Raghunathan, Professor</td>
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<td>073-1393 The Role Of Physician Alignment and Organizational Structures in Bundled Payments</td>
<td>Jan Vlachy, Student; Turgay Ayer, Assistant Professor; Mehmet Ayvaci, Assistant Professor; Srinivasan Raghunathan, Professor</td>
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<td>073-1393 The Role Of Physician Alignment and Organizational Structures in Bundled Payments</td>
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<td>073-0623 Managing the Perceived Quality of Outpatient Medical Services</td>
<td>S Srivatsa Srinivas, Student; Rahul Marathe, Associate Professor</td>
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<td>073-0623 Managing the Perceived Quality of Outpatient Medical Services</td>
<td>Chair(s): Aber Elsaleiby</td>
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<td>073-0185 The Role of External Incentives in Improving Hospital Quality Performance</td>
<td>Xiaowen Huang, Associate Professor; John Ni, Assistant Professor</td>
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<td>073-0185 The Role of External Incentives in Improving Hospital Quality Performance</td>
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<td>073-1160 The Mediating Effects of Physician-patient Relationship, Perceived Efficacy and Behavior Intention on the Donabedian Model</td>
<td>Dong-Shang Chang, Professor; Will-Lie Chen, Associate Professor; Rouwen Wang, Student; Chung-Cheng Chen, Student</td>
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<td>073-1160 The Mediating Effects of Physician-patient Relationship, Perceived Efficacy and Behavior Intention on the Donabedian Model</td>
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<td>073-1670 Patient Centered Care and Outcome Quality: A Longitudinal Analysis of U.S. Acute Care Hospitals</td>
<td>Aber Elsaleiby, Assistant Professor, UIUC, United States</td>
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<td></td>
<td>073-1670 Patient Centered Care and Outcome Quality: A Longitudinal Analysis of U.S. Acute Care Hospitals</td>
<td>Chair(s): Aber Elsaleiby</td>
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We investigate the role of patient centeredness in impacting hospitals’ outcome quality. Analyzing longitudinal data from more than 4000 U.S. acute care hospitals across several major-medical conditions treated by these hospitals, we report on several intriguing findings. The paper discusses several managerial and policy implications.

**073-0559**  
**Dynamic Recommendation at Checkout Under Inventory Constraint**  
Xī Chén, Assistant Professor, New York University, United States  
Will Ma, Student, Massachusetts Institute of Technology, United States  
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States  
Linwei Xin, Assistant Professor, University of Illinois Urbana-Champaign, United States  

Motivated by a new deployment at Walmart's online grocery, we study an inventory-constrained assortment planning problem where customers arrive with an item of initial interest, and the retailer can offer add-ons. We develop a robust online algorithm using the novel notion of an inventory protection level in expectation.

**073-0909**  
**The Impact of Sequential Product Exchange on Assortment Planning, Pricing and Return Fees**  
Laura Wagner, Student, I E S E, Spain  
Victor Martínez-de-Albéniz, Associate Professor, I E S E, Spain  

Lenient return policies enable consumers to return and/or exchange products they are unsatisfied with, which both increases sales figures and adds to retailer costs. We incorporate consumers’ sequential return behaviour into consumer choice models and study its impact on a retailer’s optimal assortment, pricing and return fee decisions.

**073-1361**  
**The Role of Stars and Musicals on Broadway**  
Kyle Maclean, Lecturer, University of Western Ontario, Canada  
Srinivas Krishnamoorthy, Assistant Professor, Tulane University, United States  

Using the technique of quantile regression, we test the role of Stars and Musicals on Broadway. We find that Stars and Musicals improve expected revenues but have do not guarantee a blockbuster. No one knows how the audience will react to a particular show.

**073-0021**  
**Coordinating Supply and Demand on an On-Demand Service Platform: Price, Wage, and Payout Ratio**  
Jiaru Bai, Student, University of California Irvine, United States  
Rick So, Professor, University of California Irvine, United States  
Christopher Tang, Professor, ucla, United States  
Xiqun Chen, Professor, Zhejiang University, China  
Hai Wang, Assistant Professor, Singapore Management University, Singapore  

We study an on-demand service platform uses earnings-sensitive independent providers with heterogeneous reservation price (for work participation) to serve its wait-time and price sensitive customers with heterogeneous valuation of the service. The platform needs to select the optimal price, wage and payout ratio to maximize its own profit.

**073-2081**  
**Real-time Optimization of Personalized Assortments**  
Negin Golrezaei, Student, University of Southern California, United States  
Hamid Nazerzadeh, Assistant Professor, University of Southern California, United States  
Paat Rusmevichientong, Associate Professor, University of Southern California, United States  

Motivated by the availability of real-time data on customer characteristics, we consider the problem of personalizing the assortment of products to customers. We propose a family of index-based policies that effectively coordinate the real-time assortment decisions with the inventory constraints. We prove that our policies achieve an optimal competitive ratio.

**073-0136**  
**The ZocDoc Effect: How Does Online Information Impact Appointment Availability in Out-Patient Care?**  
Yuqian Xu, Student, New York University, United States  
Mor Armony, Associate Professor, New York University, United States  

In this paper, we propose a queuing model to study the impact of online channels. We analyze the impact of in-clinic service time and the number of offered appointments on patients' queue joining decision and doctor's service decision. We characterize the equilibrium strategies in our settings.

**073-0274**  
**Multimodularity in the Stochastic Appointment Scheduling Problem With Discrete Arrival Epochs**
We address the problem of designing appointment scheduling strategies that account for patients’ no-show behavior, non-punctuality, emergency walk-ins and random service times. We maintain the discrete nature of the appointment scheduling problem by considering arrival epochs with discrete supports. We demonstrate that the optimal scheduling strategy minimizes a multimodal function.

To alleviate Emergency Department congestion, hospitals may overflow the boarding patients to non-primary inpatient wards when they wait too long. We develop approximate dynamic programming to aid the overflow decision making. We discuss the choice of basis functions from an auxiliary single-pool system and a fluid control problem.

Despite the prevalence and significance of walk-ins in healthcare, we know little about how to plan and manage the daily operations of a healthcare facility that accepts both scheduled and walk-in patients. We present a data-driven optimization model to determine the optimal appointment template in the presence of potential walk-ins.

Adopting a transaction cost economics perspective, this empirical study identifies a set of economic antecedents that influence the choice of exit strategies for firms operating in the UK. The results of this research have important implications for decision makers planning for the forthcoming exit of Britain from the European Union (BREXIT).

YouTubers play a significant role in promoting videogames and nurturing a community of players, which is a resource the videogame developers can actively engage with. This research applies social network theory to examine the novel practice of videogame developers that embed players and YouTubers into their supply chains.

We hypothesize that a firm’s ability to integrate will moderate the relationship that operational complexity has on financial performance. Further, we explicate the differences between structural and infrastructural complexity. Using archival data, we find support for our hypotheses and advance theory on managing the differing dimensions of operational complexity.

During the execution of a public project (e.g., the construction of a hospital), should regulators continually scrutinize the contractor’s operations? Or is this behavior obstructive? In this paper we explore the causal impact of government oversight on a project’s delay time and cost overrun.

Contracting in Medical Equipment Maintenance Services: An Empirical Investigation
Tian Chan, Assistant Professor, Emory University, United States
Francis De Vericourt, Professor, ESMT, Germany
Omar Besbes, Assistant Professor, Columbia University, United States
073-1348 Modular Component Designs: The Perils of Component Sharing
Nitish Jain, Assistant Professor, London Business School, United Kingdom
Kamalini Ramdas, Professor, London Business School, United Kingdom
Jonathan Williams, Assistant Professor, University of Georgia, United States
Jacob Malone, Lead Strategist, ??????, United States

Modular component designs are often advocated for the associated cost and pooling advantage. The one-component-to-multiple-products design approach, however, may compromise the quality. Using publicly available data, in automotive industry, on the recalls and extent of component-sharing, we empirically examine this conjectured negative impact of modular component designs approach.

073-1625 Surfacing the Submerged State: Operational Transparency Increases Trust in and Engagement with Government
Ryan Buell, Professor, Harvard University, United States
Ethan Porter, Student, University of Chicago, United States
Michael Norton, Professor, Harvard University, United States

As Americans' trust in government nears historic lows, frustration with government performance approaches record highs. We propose that Americans' views of government can be reshaped by increasing government's operational transparency - the extent to which citizens can see the often-hidden work that government performs.

073-0304 Evaluating Firm Resilience to Supply Chain Disruptions
Milad Baghersad, Student, Virginia Polytechnic Institute And State University, United States
Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States

This research draws from the system resilience literature to propose four different measures for quantifying the resilience of firms against supply chain disruptions. We deploy these four resilience metrics to evaluate and compare resilience performance of around 200 disrupted firms during 2005 to 2013.

073-0936 Effectiveness of Resilience Capabilities in Mitigating Disruptions: Does Supply Chain Complexity Help?
Paolo Trucco, Professor, Politecnico Di Milano, Italy
Seyoum Esthetu Birkie, Assistant Professor, Politecnico Di Milano, Italy
Pablo Fernandez Campos, Student, Politecnico Di Milano, Italy

This study aims to investigate the influence of supply chain (SC) complexity on the effectiveness of resilience capabilities in mitigating supply chain disruptions. SC complexity is found to have significantly positive relation with performance improvement after disruption along with resilience capability; it also positively moderates the resilience-performance link.

073-1743 The Role of Structural Embeddedness in Responding to Supply Chain Disruptions
Byung-Gak Son, Senior Lecturer, Cass Business School, United Kingdom
Canan Kocabasoglu Hillmer, Senior Lecturer, Cass Business School, United Kingdom

The focus in SCRM literature has been more on relational rather than structural embeddedness. We aim to understand the role of structural embeddedness - by mapping out the actual supply chain structure-in responding to disruption and the organizational factors that enable better use of the network structure.

073-0401 Managerial Quality Decisions Pre and Post Product Launch
Kyle Goldschmidt, Assistant Professor, University of St. Thomas, United States
Sameer Kumar, Professor, University of St. Thomas, United States
Janine Sanders, Assistant Professor, University of St. Thomas, United States
Sheneeta White, Associate Professor, University of St. Thomas, United States

When launching a new product, important decisions are made that impact product quality. However, typically, customer feedback pre product launch is limited and companies only find out about potential quality issues post product launch. We investigate managerial decisions regarding quality investments both pre and post product launch.

073-0862 Firm Learning from Failures and Recalls of Products in Supply Chains
Gopesh Anand, Associate Professor, University of Illinois Urbana-Champaign, United States
Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States

In this paper we investigate how and when firms learn from failures of products. In this empirical study we argue that firms involved in knowledge creation learn from failures of products faster than firms engaged only in usage of knowledge. We identify several firm level moderators of learning.
### Saturday, 08:00 AM - 09:30 AM

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<td>073-0085</td>
<td>Managing Quality Risk and Determining Sourcing Strategy: Differential Effects of Appraisal, Quality Management, and Auditing</td>
<td>Panels, Tutorials, Meetings</td>
<td>Elena Katok</td>
<td>Using survey methods and secondary data we empirically examine the role of appraisal activities, quality management systems, and auditing or certification in managing supplier quality risk. We then evaluate factors which influence a buying firm to maintain or change sourcing strategy in the event of a supplier quality failure.</td>
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<td>073-0948</td>
<td>Behavioral Operations Management: Perspectives and Trends</td>
<td>Socially Responsible Operations</td>
<td>Elena Katok</td>
<td>I will provide an overview of recent research in Behavioral Operations Management, including best practices, topics, and promising new directions.</td>
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<td>073-1434</td>
<td>Do Mandatory Overtime Laws Improve Quality? Staffing Decisions and Operational Flexibility of Nursing Homes</td>
<td>Socially Responsible Operations</td>
<td>Vincent Slaugh</td>
<td>During the 2000s, over a dozen U.S. states passed laws that prohibit healthcare employers from mandating overtime for nurses. Using a nationwide panel data set from 2004 to 2012, we find that these mandatory overtime laws reduced the service quality of nursing homes.</td>
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<td>073-1472</td>
<td>Optimizing CMS’s Nursing Home Rating System: Inspection and Audit</td>
<td>Panels, Tutorials, Meetings</td>
<td>Niam Yaraghi, Ram Gopal</td>
<td>CMS's nursing home rating system combines inspection and self-reported measures to generate ratings, which may lead to bias. In this research, we formulate the problem by using a graph-based method to examine the optimal inspection procedure for CMS, and conduct an audit simulation to summarize insights on parameter settings.</td>
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<td>073-1482</td>
<td>Operations Management and Older Life: Conceptual and Practical Challenges on the Care-Where Landscape</td>
<td>Socially Responsible Operations</td>
<td>Matthew Walsman</td>
<td>We examine themes of caring for an aging population through the lens of service operations management. Specifically, we develop a framework for care of the aging along the dimensions of care and location. We then use this ‘care-where’ framework as a way of identifying practical solutions, opportunities and challenges.</td>
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<tr>
<td>073-1265</td>
<td>Nurse Aide Staffing Policies for Long-Term Care</td>
<td>Panels, Tutorials, Meetings</td>
<td>Vincent Slaugh</td>
<td>We study the design of nurse aide staffing policies in nursing homes for their effect on both nurse aides and residents. We provide analytical results for the use of on-call pools and insights from collaborations with nursing homes.</td>
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<tr>
<td>073-0214</td>
<td>Managing Inventory of Perishable Products at Multiple Locations</td>
<td>Retail Operations Management</td>
<td>Xiajun Pan</td>
<td>We consider a retailer selling multiple perishable products with random demands over a single season. This project may be applied to warehouse management in e-commerce.</td>
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<tr>
<td>073-1473</td>
<td>Learning with Parsimonious Ranking Based Model</td>
<td>Panels, Tutorials, Meetings</td>
<td>Fang Liu, Canan Ulu</td>
<td>The number of preference lists in ranking-based model grows exponentially with the number of products. To mitigate the computational burden for retailers dynamically learning about customer preferences for assortment planning, we propose and examine the value of a learning model in which retailers learns only the first few customer choices.</td>
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<tr>
<td>073-0885</td>
<td>Add-on Pricing Under Uncertainty</td>
<td>Panels, Tutorials, Meetings</td>
<td>Quan Zheng, Xiajun Pan</td>
<td>The presentations for add-on pricing under uncertainty provide a framework for understanding how to price add-ons in uncertain environments. These include analytical models, empirical studies, and case studies.</td>
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</table>
Add-on products can be sold individually or through the bundle with the base product. Consumers are uncertain about their value on the add-on when purchasing the base product. We first characterize the optimal selling strategies under various scenarios for a monopoly seller, and then consider duopoly competition with symmetric firms.

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**Session: Inventory Management in Retailing**

**Chair(s):** Fredrik Eng-Larsson

**Track: Retail Operations Management**

**073-1182** Estimating Demand for Substitutable Products When Inventory Records Are Unreliable

Daniel Steeneck, Assistant Professor, Air Force Institute of Technology, United States
Fredrik Eng-Larsson, Assistant Professor, Stockholm Business School, Sweden
Francisco Jauffred, Lecturer, Massachusetts Institute of Technology, United States

We present a procedure for estimating demand for substitutable products when the inventory record is unreliable and only validated infrequently and irregularly. The procedure uses a structural model of demand and inventory progression, which is estimated using a modified version of the EM-algorithm.

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**073-0180** An Optimization Model to Solve the Packaging Problem Along Supply Chains of Emerging Markets

Christopher Mejia Argueta, Assistant Professor, Eindhoven University of Technology, Netherlands
Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

We develop a mixed integer linear programming to minimize total logistics costs of the packaging configuration. This configuration comprises package size, tiered design and unpacking locations to serve various channels in megacities of emerging markets. We verify our proposal using data from a CPG firm and derive managerial insights.

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**073-1725** The Impact of Demand Uncertainty on Performance in Scan-Based Trading Contracts

Min Choi, Assistant Professor, California State University Fullerton, United States
Elliott Rabinovich, Professor, Arizona State University Tempe, United States

In grocery retailing, SBT contracts are gradually replacing VMI contracts. While retailers might want to adopt SBT to defer inventory ownership until point-of-sale, incentives to suppliers are unclear. Using a set of stylized models and numerical experiments, we find conditions under which SBT contracts could be mutually beneficial.

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**073-0828** Optimizing the Flow Policy in a Two-Echelon Distribution System

Pedro Amorim, Professor, Universidade do Porto/Faculdade de Engenharia, Portugal
Horácio Neri, Consultant, LTPlabs, Portugal
Paulo Sousa, Consultant, LTPlabs, Portugal
Bernardo Almada-Lobo, Associate Professor, Universidade do Porto/Faculdade de Engenharia, Portugal

Retail stores are often replenished either from a distribution center or directly from the vendor using a flow-through policy. Working with a major Portuguese retailer, we have developed a cost model that balances supply chain costs in order to find the best flow policy.

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**Session: The Role of Big Data and Predictive Analytics on Disaster Relief Operations**

**Chair(s):** Samuel Fosso Wamba

**Track: Humanitarian Operations and Crisis Management**

**073-1425** The Role of Big Data and Predictive Analytics on Disaster Relief Operations

Samuel Fosso Wamba, Professor, Toulouse Business School, France

The purpose of the paper is to investigate the role of Big Data and Predictive Analytics (BDPA) on disaster relief operations. The theoretical model is firmly grounded in contingent resource based view. We tested our hypotheses using data gathered using structured questionnaire.

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**073-1476** Supply Chain Management in Limited Data Environments: Application to Community Health Workers

Kezban Yagci Sokat, Student, Northwestern University, United States
Karen Sniwolitz, Professor, Northwestern University, United States

Limited historical data and limited on hand inventory bring up additional difficulty to supply chain management. In collaboration with Last Mile Health, we develop an inventory optimization model for different levels of the supply chain where we link health outcomes to inventory optimization under limited.

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**073-1952** The Role of Big Data & Predictive Analytics (BDPA) on Agility of Disaster Relief Operations

Zongwei Luo, Associate Professor, Southern University of Science and Tech, China
Rameshwar Dubey, Associate Professor, Symbiosis International University, India

We argue big data and predictive analytics (BDPA) as a capability using resource based view (RBV) which can help to enhance agility in disaster relief operations (DRO). We grounded our framework in RBV and tested our research hypotheses using data collected from senior managers engaged in DROs.

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**Session: Sustenance and Supply Chain Design**

**Chair(s):** Nico Vandaele

**Track: Humanitarian Operations and Crisis Management**

**073-0619** School Feeding Supply Chain Optimization in Bhutan: A Scenario Analysis

Maximilian Burkhardt, Student, WHU - Otto Beisheim School of Management, Germany
Stefan Spinler, Professor, WHU - Otto Beisheim School of Management, Germany
Luk Van Wassenhove, Professor, INSEAD, France

We model Bhutan’s school feeding supply chain for non-perishables and optimize it along cost and service level. For the optimization, we develop feasible scenarios varying from small operational changes to larger changes of the network setup. Based on our results we derive design criteria for other school feeding supply chains.
073-0873  Econometric Estimation of the Anticipation Effects of Water Deprivation in Post-Disaster Environments
Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States
Jianhua Yang, Professor, University of Science & Technology Beijing, China
This research is an exploratory analysis of the anticipation effects of the potential water deprivation immediately after a disaster strikes. Survey data of disaster affected population is analyzed in a Contingent Valuation experimental design to quantitatively estimate anxiety and deprivation effects to measure human suffering in humanitarian logistics modeling.

073-0939  Supply Chain Design to Improve Access-to-Medicines
rico vandaele, Professor, KU Leuven, Belgium
stef lemmens, Student, K.U.Leuven, Belgium
Mauro Bernuzzi, Professor, KU Leuven, Belgium
Sherif Hassane, Manager academic projects, GSK, Belgium
Supply chains supportive of Access-To-Medicines, like vaccine supply chains, impose considerable challenges on the design process. A broader stakeholder based framework brings a balanced set of Key Performance Indicators against which design options and scenarios are evaluated. From a shortlist of championing scenarios, the final scenario will be chosen.

073-0406  A Multi-Echelon Logistics and Disposal Optimization Model for Municipal Solid Waste Management in Beijing
Annabelle Schreiber, Student, University of Science & Technology Beijing, China
Yingying Shao, Student, University of Science and Technology of China, China
Municipal solid waste management system was analyzed from waste collection to different waste disposal plants in Beijing. A cost optimization of the system is calculated by defining a linear programming model. And the most adequate solution is proposed after analysis of multiple scenarios to collect and process waste.

073-0908  Waste Emissions Reduction Allocation for Regional Industrial Sectors in China Based on DEA Method
Yingying Shao, Student, University of Science and Technology of China, China
The industry activities produce massive pollution emissions, which are the source of environmental issues. To control and reduce the energy consumption and waste emissions, we propose a novel DEA model to allocate the reduction targets for each region in the context of considering the interests of overall and individuals.

073-1855  How Market Competition and Regulation Strictness Impact Carmakers' Misconduct Behavior?
Kejia Hu, Student, Northwestern University Kellogg School of Management, United States
Sunil Chopra, Professor, Northwestern University Kellogg School of Management, United States
In this research, we use our theoretical and empirical analysis (using data from 13-year records of car-by-car on-road emission on European roads) to show that carmakers' tendency to commit misconduct increases as competition becomes more intense and standards become stricter.

073-0254  Government Interventions in Promoting Sustainable Practices in Agriculture
Duygu Akkaya, Student, Stanford University, United States
Hau Lee, Professor, Stanford University, United States
Government support is often used to incentivize producers to convert to sustainable practices due to numerous environmental and health concerns. We investigate the effectiveness of tax, subsidy, and hybrid policies in terms of their impact on sustainable practice adoption, producers' profits, consumer welfare, and return on government spending.

073-0657  Contract Design Under Asymmetric Information in Contract Farming
Awi Federgruen, Professor, Columbia University, United States
Upmanu Lall, Professor, Columbia University, United States
A. Serdar Simsek, Assistant Professor, University of Texas Dallas, United States
In contract farming, a manufacturer selects the set of farmers that minimizes her expected procurement and distribution costs before the growing season. We analyze the contract design problem in this setting under asymmetric information. We applied our model to a company contracting with thousands of farmers in India.

073-0112  Theory of Planned Behaviour & Food Waste: Consumer Perspective in Qatar
Akunna Oledinma, Lecturer, Cranfield University, United Kingdom
Emel Aktas, Senior Lecturer, Cranfield University, United Kingdom
Zeynep Topaloglu, Assistant Professor, Georgetown University, Qatar
Amir Sharif, Professor, Brunel University, United Kingdom
In this study, we aim to provide a novel conceptual model to understand the effect of planned behavior on food waste: consumer perspective in Qatar. We applied the model to a company contracting with thousands of farmers in India.
Food waste contravenes sustainable behaviour: one third of global food is wasted. Studies have predominantly being from engineering or technological perspective. We conducted an exploratory research to understand why consumers waste food. Policies and actions on food waste are more effective if they target motivation for food waste.
Chair(s): Andrew Wu, Assistant Professor, University of Michigan, United States

Dimitry Slavin, Student, University of Michigan, United States

Text-Based Positioning of Firms Along the Supply Chain

Andrew Wu, Assistant Professor, University of Michigan, United States

Dimitry Slavin, Student, University of Michigan, United States

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Dimitry Slavin, Student, University of Michigan, United States

Text-Based Positioning of Firms Along the Supply Chain
073-0773  Deploying Sensors and High Performance Position Systems in Precision Agriculture
Haibo Wang, Associate Professor, ???, United States
Bahram Alidaee, Professor, University of Mississippi, United States
This paper considers the problem of employing sensors and high performance position systems as the infrastructure of precision agriculture. We propose a capacitated facility location model to address the communication issues in agricultural operations and develop a fast heuristic to solve this computational challenging problem.

073-0645  Lean Production Concept in Brazilian Agribusiness Sector
Wagner Delmo Croce, Student, Centro Paula Souza, Brazil
Claudio Dona, Student, Centro Paula Souza, Brazil
Clayton Mangini, Student, Centro Paula Souza, Brazil
Julio Cruz, Student, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
This paper aims to present a literature review on the Lean Production system and its applications with the agribusiness sector in Brazilian companies. The results showed that the techniques and tools used more focused on processes and manufacturing flow control categories than on the human factor and metrics.

073-1314  A Greedy Heuristic for Artisan Ice Cream Production Scheduling
Tom Rihm, Student, University of Bern, Switzerland
We consider a specific lot-sizing and scheduling problem that arises in a local artisan ice cream manufacturing company. The planning problem consists in minimizing the setup costs while meeting the given demand for each flavor. We propose an efficient greedy heuristic that provides near-optimal solutions for real-life instances.

073-1926  Shark Tank Fails to Include POM in Evaluating the Acceptability of an Agricultural Investment
Martin Starr, Emeritus Professor, Rollins College, United States
Sushil Gupta, Professor, Florida International University, United States
Sharks emphasize marketing/finance in their decisions, often overlooking production and operations management considerations. In a presentation for using "sweet" instead of "grain" corn to make corn chips, the sharks did not invest because they failed to ask what could be done to reduce the higher cost of sweet corn.

073-1353  Signaling Product Quality Through A Trial Period
Shouqiang Wang, Assistant Professor, Naveen Jindal School of Management, United States
Gulru Ozkan-Seely, Assistant Professor, University of Washington Bothell, United States
We evaluate a firm's pricing and timing strategies when launching via a trial period a product with privately observable quality. The trial period allows consumers to learn about quality ("learning effect"), while increasing heterogeneity of consumers' willingness-to-pay ("dispersion effect"). We show that price and trial length work as dual signals.

073-1393  Pivot Sequencing and Survival Rates in Business Startups
Berke Guzelsoy, Student, Boston University, United States
Nitin Joglekar, Associate Professor, Boston University, United States
Moren Levesque, Professor, York University, Canada
Pivoting to achieve growth is common in startups. We characterize relationships between pivot sequencing and firm survival, and use hazard rate models to test these relationships on roughly 5,000 startups.

073-1540  The Impact of Resources on Achieving Product Launch Milestones in Startups
Jennifer Bailey, Assistant Professor, Babson College, United States
We examine the critical resources and capabilities which can impact the successful achievement of new venture milestones such as the time to prototype development and the time to product launch.

073-2016  R&D Spending: Dynamic or Persistent?
Christophe Pennetier, Student, INSEAD, Singapore
Jurgen Mihm, Associate Professor, INSEAD, France
Karan Girotra, Professor, INSEAD, France
We study how a given amount of R&D spending is best allocated over time to optimize R&D performance. Using a sample of US public companies, we estimate the interaction between R&D investment and types of innovation strategy.

073-1003  Manipulation for Competition: Pricing Models in the Presence of Promotional Reviews
Tingting Nian, Assistant Professor, University of California, Irvine, United States
Liangfei Qiu, Assistant Professor, University of Florida, United States
Jingchuan Pu, Student, University of Florida, United States
In the present study, we develop an analytical model to analyze the effect of promotional reviews under two commonly used pricing regimes: wholesale pricing and agency pricing. Our results should be of interest to practitioners as they highlight the interaction between promotional reviews and different pricing regimes.
In mobile advertising, selling an impression to one advertiser leads to allocative inefficiency. We explore the economic value of the setting where an impression is partitioned into time slots and sold to multiple advertisers. We obtain an optimal mechanism and identify real-world situations where both buyers and sellers gain handsomely.

In this study, we propose an econometric model to examine the drivers of social media engagement. Set in the context of national elections, we assemble a novel data set to examine the impacts of tweeting behavior of human brands on the social media engagement with audience.

We study the effect of consumer reviews on the dominant online retailer that launches its own product and the supplier that sells the product through the retailer, when the online retailer acts as a supplier selling its own product while it acts as a platform provider or as a reseller.

This paper analyzes the demand uncertainty at the capacitated vehicle routing problem. Authors used the principle of extension of Zadeh and a fuzzy clustering technique to solve different scenarios. Considering a subjective knowledge from the employees, authors discuss the impact of uncertain demand onto the amount of vehicles.

We focus on the problem of scheduling a set of resources that perform service operations on a set of geographically distributed customers and subject to several operational constraints over a planning horizon. We present the application in maintenance services setting with an integrated stochastic and combinatorial optimization models approach.

We develop an inventory-based scheduling and routing methodology for multiple delivery trucks. The scheduling of deliveries depends on anticipated stockouts, and near-by deliveries to other customers in a milk run. We test on actual company data, discussing real-world challenges to implementation.

This paper addresses the multi-periods vehicle routing problem. We develop an easy-to-implement heuristic in order to gain an effective and effective solution quickly. At last, we apply the model and algorithm to the real multi-periods problem in logistic company.

We examine the value of Bayesian demand learning in the context of a dynamic pricing problem with inventory scarcity. An interesting and counter-intuitive numerical result is discovered where a no-learning system may outperform the corresponding learning system. We perform analytical analysis to shed light on this observation.

We consider a dynamic two-way incentives referral program, where the referring customer receives a reward and the referred friends receives a discount. We derive the optimal combination of reward and discount over each period and we investigate how to optimally attract new customers using the referral program.
We explore, when pursuing high margins from organic products, how retailers adjust the pricing strategy of conventional product. We find that the increasing unit sale of organic products lowers the average price of conventional products and intensifies the competition within conventional products.
Saturday, 08:00 AM - 09:30 AM

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**Track: Service Operations**

**Session:** Topics in Higher Education

Chair(s): Mirjeta Beqiri

**073-0363** Impact of Depth and Breadth of Student Involvement on Academic Achievement

Albena Ivanova, Associate Professor, 1979, United States

This study investigates the direct and interaction effects of breadth and depth of student involvement in campus activities on academic achievement, measured by the student grade point average (GPA).

**073-0102** The Application of a Variant Approach to 'Lean' Implementation Within a UK Business School

Harry Barton, Professor, Nottingham Business School, United Kingdom

This paper provides a new perspective on operational improvement within Higher Education and draws on contemporary views of 'lean' as a knowledge creation process. The overall lean operating system covers: structure, management and leadership, processes, tools and technologies, and seeks to engage staff through a process of continuous improvement.

**073-1398** An Empirical Study of Service Quality Factors Impacting Student Satisfaction in Higher Education

Mirjeta Beqiri, Associate Professor, Gonzaga University, United States

Gena Hoxha, Lecturer, Gonzaga University, United States

Ines Troshani, Student, Gonzaga University, United States

This study aims to enrich the existing literature in regard to service quality and student satisfaction as well as the extent of their relationship. Moreover, it provides various higher institution stakeholders with an informed path to amelioration of student services and illuminates areas where improvement efforts should be concentrated.

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**Track: General/Emerging Topics in Operations Management**

**Session:** Supply Chain Management - General Topics

Chair(s): Zhengping Wu

**073-0464** Market Characteristics and Vertical Strategic Interaction: Implications for Distribution Channels

Shahryar Gheibi, Assistant Professor, Siena College, United States

Eunkyu Lee, Professor, Syracuse University, United States

We study the relationship between market characteristics and the type of vertical strategic interactions within a decentralized distribution channel. Our analysis indicates that a single aggregate-level market characteristic holds the key to the full characterization of the linkage.

**073-0561** Product Innovation and Consumers' Self-Selection Behavior

Charles Wang, Associate Professor, Suny At Buffalo, United States

Imsu Park, Researcher, Suny At Buffalo, United States

In this study we examine a manufacturing firm’s optimal innovation and pricing strategy in consideration of consumers’ choices between a high-quality product and a low-quality product available in the market. We identify the optimal pricing and quality decisions for the firm.

**073-1481** Supplier Selection Under Commodity Price Risk

Karca Aral, Assistant Professor, Syracuse University, United States

We consider a procurement auction setting where the suppliers are subject to commodity price uncertainty. In such settings, buyers typically use price adjustment clauses based on producer price indices. We identify the effect of price adjustment clauses on endogenous entry and characterize the optimal price adjustment structure.

**073-1832** Procurement Mechanism with Capacity Auditing

Wanshan Zhu, Associate Professor, Tsinghua University, China

Zhengping Wu, Associate Professor, Syracuse University, United States

A auto manufacturer purchases a main component from its supplier while facing uncertain supplier production capacity information. The manufacturer has a capacity management team to audit its supplier's capacity. We study the manufacturer's optimal procurement quantity and auditing decisions.

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**Track: Manufacturing Operations**

**Session:** Innovation Driven Manufacturing Strategies

Chair(s): Lingxiu Dong Duo Shi

**073-0636** The Optimal Pricing Strategy for Two-sided Platform Delivery in the Sharing Economy

Ling-Chieh Kung, Assistant Professor, National Taiwan University, Taiwan, Republic of China

Guan-Yu Zhong, Student, National Taiwan University, Taiwan, Republic of China

We consider a platform matching shoppers and consumers of grocery delivery service with cross-side network externality. The platform decides the consumers' membership and transaction fees and shoppers' per-delivery subsidy. Through a game-theoretic analysis, the optimal strategy is shown to be membership-based pricing.

**073-1357** A Theoretical Analysis of the Lean Start-up's Agile Product Development Process

Onesun Yoo, Assistant Professor, University College London, United Kingdom

Tingliang Huang, Assistant Professor, Boston College, United States

Kenan Arfinoglu, Assistant Professor, University College London, United Kingdom

We provide a theoretical foundation for the lean start-up's agile product development process. It helps us better understand why lean start-up works, and also predict when it does not work. We discuss the implications of our results to research and practice.

**073-1674** Dynamic Inventory and Price Control in the Face of Unknown Demand
We study adaptive policies that combat unknown demand in a dynamic inventory and price control setting. Inventory control is achieved by targeting newsvendor ordering quantities for empirical demand distributions learned over time. On top of that, demand-affecting prices are selected in a fashion that balances between exploration and exploitation.

073-0013 3D Printing vs. Traditional Flexible Technology: Implications for Manufacturing Strategy

Lingxiu Dong, Professor, Washington University St Louis, United States
Duo Shi, Student, Washington University St Louis, United States
Fuqiang Zhang, Professor, Washington University St Louis, United States

We analytically compare a firm's manufacturing strategies under two types of flexible technologies: the traditional one and 3D printing. We find that different flexible technologies lead to distinct structures of the firm's assortment and technology assignment decisions. They also have different implications for the firm's product variety choice.

073-1504 Meaningful Learning to Increase Learning in Logistic

Celis Langhi, Professor, CEETEPS, Brazil
Caio Stettiner, Professor, CEETEPS, Brazil
Celso Jacobvicius, Professor, CEETEPS, Brazil
Daniel Santos, Professor, CEETEPS, Brazil
Paulo ramirez, Professor, IFSP - Instituto Federal de São Paulo, Brazil

The theory of meaningful learning, when applied in face-to-face classes of Logistics courses, can provide better learning outcomes. It is proposed a study on the organization of the contents of Logistics classes through previous organizers of memory and problem solving.

073-1495 Agile Methodologies to Increase Learning in Logistic

Celis Langhi, Professor, CEETEPS, Brazil
Alexandre Formigoni, Professor, CEETEPS, Brazil
Helena Peterossi, Professor, CEETEPS, Brazil
Mariluce Martino, Professor, CEETEPS, Brazil
Sergio Menino, Professor, CEETEPS, Brazil

The teaching of Logistics can have better results using the principles of agile methodologies. In an experiment carried out in a Technology course in São Paulo, the quantitative increase of learning was observed with the application of experiential techniques, after explaining the theoretical content.

073-1839 The Teaching of Entrepreneurship in Brazil Partnership of University with Incubators

Evelin Croce, Professor, Centro Paula Souza, Brazil
Roberto Kanaane, Professor, CEETEPS, Brazil

The study aimed to identify the importance of the partnership of a public university with a business incubator for the development of entrepreneurship. The method used was a field research, with case study, in an incubator of companies, demonstrating the viability of the initiative as an incentive to entrepreneurship.

073-1226 Designing Practical Projects to Connect Engineering Courses to Production Plant

Patricia Cardoso, Professor, Federal University of Espirito Santo, Brazil
Gisele Chaves, Professor, Federal University of Espirito Santo, Brazil

Coordinated by a professor, students work in collaborative groups to identify how theories can be applied in order to solve an industrial problem. The evidences suggest that in-plant projects are instructional approaches that offer the potential to help students develop flexible understanding and lifelong learning skills.

073-0241 Optimal Size of a Combined Heat and Power Generator for an Industrial Firm

Gilvan Souza, Professor, Indiana University Bloomington, United States
Wenbin Wang, Associate Professor, Shanghai Univ. of Finance and Economics, China
Owen Wu, Associate Professor, Indiana University, United States

We consider a manufacturer who uses both steam and electricity in its primary production process makes investment on a Combined Heat and Power (CHP) system. We provide a decision model and find the optimal capacity and operating policy for a CHP system that reduce the total investment and energy costs.

073-0796 Optimal Gas Storage Valuation and Futures Trading in Incomplete Markets

Nils Loehndorf, Assistant Professor, Vienna Univ of Econ & Business Admin, Austria
David Wozabal, Assistant Professor, Technische Universität Munchen, Germany

We present a new approach for gas storage valuation that directly solves the underlying high-dimensional dynamic program by discretizing the price process to a scenario lattice and approximating the value function via cutting planes. We show that the resulting policy outperforms the rolling intrinsic solution on simulated and real data.

073-0857 Is Time-of-Use Electricity Pricing Effective?

Reid Miller, Student, University of Waterloo, Canada
Lukasz Golab, Associate Professor, University of Waterloo, Canada
Catherine Rosenberg, Professor, University of Waterloo, Canada
Pricing schemes intended to reduce peak electricity consumption such as time-of-use (TOU) are becoming tractable as advanced metering proliferates. In this talk, we evaluate the impact and discuss the implications of mandatory TOU pricing in southwestern Ontario, Canada.

Managing Shutdown Risk in Commodity and Energy Production

Alessio Trivella, Student, Technical University of Denmark, Denmark
Stein-Erik Fleten, Professor, Norwegian University of Science And Technology, Norway
Denis Mazieres, Student, Birkbeck University of London, United Kingdom
Selvaprabu Nadarajah, Assistant Professor, University of Illinois at Chicago, United States
David Pisinger, Professor, Technical University of Denmark, Denmark

Commodity/energy production assets face shutdown risk due to uncertain input/output prices and exchange rates. We formulate a new shutdown risk-averse model and extend an approximate dynamic programming method to compute risk-averse operating policies. We compare our policies with CVaR-based policies and financial contracting on a real Aluminum application.
073-0704 Innovative Use of Operational Tools for Improving Compassionate Dialysis Process
Farnaz Nourbakhsh, Student, Southern Methodist University, United States
Olga Bountali, Student, Southern Methodist University, United States
Silvia Celinka, Professor, Southern Methodist University, United States
Vishal Ahuja, Assistant Professor, Cox School of Business, United States

Compassionate Dialysis refers to the practice whereby indigent patients suffering from End-stage renal disease receive dialysis under "emergency" conditions, resulting in severe congestion and treatment delays. We use process flow maps to identify process inefficiencies and simulation modeling to estimate various congestion metrics as a function of stochastic arrival/service rates.

073-0930 An Empirical Analysis on Stroke Care Process
Brandon Lee, Student, Clemson University, United States
Lawrence Fredendall, Professor, Clemson University, United States
Bernardo Quiroga, Assistant Professor, Clemson University, United States

This study examines how key variables associated with the stroke patient-care system (e.g., pre-notification to hospital, telemedicine, transport route, etc.) affect the clinical outcomes of the stroke patients after going through the care processes. The study also examines what factors influence the efficiency of the care process, e.g., LOS.

073-1404 Impact of Hospital Characteristics on Patient Choice Behavior
Deepa Wani, Assistant Professor, University of Texas San Antonio, United States
Manoj Malhotra, Professor, University of South Carolina, United States

In this study, we look various hospital level factors that influence patient choice of hospital for surgeries.

191 Does the Office of Patient Experience Matter in Improving Delivery of Care?
Luv Sharma, Assistant Professor, Univ of South Carolina, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States
Elliot Bendoly, Professor, Ohio State University, United States

This study investigates the effectiveness of an office of patient experience (OPX) in improving patient experience using 2006-2014 dataset compiled from seven different sources. Results indicate that an OPX is effective for hospitals with higher operational complexity but the benefits of an OPX come at increased cost of operations.

073-0874 Competing With Responsive Follower: Imitator And Strategic Consumers
Mike Wei, Assistant Professor, University of Buffalo, United States

In this work, we study the production and pricing decisions of a market leader facing an imitator under strategic consumer behavior with positive network externalities.

073-0704 Innovative Use of Operational Tools for Improving Compassionate Dialysis Process
Farnaz Nourbakhsh, Student, Southern Methodist University, United States
Olga Bountali, Student, Southern Methodist University, United States
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Compassionate Dialysis refers to the practice whereby indigent patients suffering from End-stage renal disease receive dialysis under "emergency" conditions, resulting in severe congestion and treatment delays. We use process flow maps to identify process inefficiencies and simulation modeling to estimate various congestion metrics as a function of stochastic arrival/service rates.

193 Dynamic Optimization of Mobile Push Advertising Campaigns
Xinshang Wang, Student, Columbia University, United States
Van-Anh Truong, Assistant Professor, Columbia University, United States
Shenghuo Zhu, Principle Engineer, Alibaba Group, United States
Qiong Zhang, Principle Engineer, Alibaba Group, United States

We study a novel resource-allocation problem faced by Alibaba Group. In this problem, mobile "push messages" must be sent to hundreds of millions of users over a day. Given users' diverse preferences, the problem aims to maximize the total benefit earned from the click-throughs on the messages.

191 Does the Office of Patient Experience Matter in Improving Delivery of Care?
Luv Sharma, Assistant Professor, Univ of South Carolina, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States
Elliot Bendoly, Professor, Ohio State University, United States

This study investigates the effectiveness of an office of patient experience (OPX) in improving patient experience using 2006-2014 dataset compiled from seven different sources. Results indicate that an OPX is effective for hospitals with higher operational complexity but the benefits of an OPX come at increased cost of operations.
We incorporate market expansion into consumer choice models and investigate the revenue management problems. We characterize the structure of the optimal policies for the problems under the consumer choice models with various market expansion effects, and develop efficient algorithms.

**073-2082 Dynamic Type Matching**  
Yun Zhou, Student, University of Toronto, Canada  
Ming Hu, Associate Professor, University of Toronto, Canada

We consider an intermediary's problem of dynamically matching demand and supply of heterogeneous types. In each period, demand and supply of various types arrive in random quantities. The platform maximizes the total discounted matching reward minus waiting/holding cost. We characterize the optimal matching policy under sufficient and robustly necessary.

**073-2083 Designing Response Supply Chain Against Bioattacks**  
Peter Yun Zhang, Student, Massachusetts Institute of Technology, United States  
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States  
Nikolaos Trichakis, Assistant Professor, Massachusetts Institute of Technology, United States

We study the problem of prepositioning medical countermeasure inventory against bioattacks. Modeling it as a two-stage robust optimization problem, we solve large instances via so-called affine policies, prove its optimality under mild assumptions, and perform a thorough case study on prepositioning inventory in the US to guard against anthrax attacks.

**073-2084 Business Models in Sharing Economy: Manufacturing Durable Goods in the Presence of Peer-To-Peer Rental Markets**  
Zhe Zhang, Student, Carnegie Mellon University, United States  
Jose Guajardo, Assistant Professor, University of California Berkeley, United States  
Vibhanshu Abhishek, Assistant Professor, Carnegie Mellon University, United States

Analyzing the interaction of a peer-to-peer (P2P) rental market and a manufacturer, we highlight consumer usage heterogeneity as an important driver of market outcomes. Different consumer usage results in different optimal strategies for the firm, and the manufacturer has incentive to facilitate P2P in many cases.

**073-0169 Scheduling Patients Across Diagnostic Units Using Self-Organizing Map**  
R.K. Jha, Student, Indian Institute of Management Raipur, India  
Bidya Sahay, Professor, Indian Institute of Management Raipur, India  
Manojit Chattopadhyay, Assistant Professor, Indian Institute of Management Raipur, India  
Y. Gaipal, Assistant Professor, Asper School of Business, Canada

The objective of this work is to provide a unique visual approach for scheduling patients across diagnostic units (DU). Motivated by literature on supply chain scheduling we use self-organizing map (SOM) based algorithm to schedule patients across DUs. Numerical experiments show SOM to be effective in scheduling patients across DUs.

**073-0131 Developing Outpatient Systems for Multi-Stage Clinics**  
Ken Klassen, Professor, Brock University, Canada  
Reena Yoogalingam, Associate Professor, Brock University, Canada

The addition of mid-level service providers (MLSPs) such as physician assistants or nurse practitioners that carry out portions of the patient care provides a viable alternative for augmenting physician capacity. Appointment scheduling rules are developed for a multi-stage service system using a simulation optimization approach.

**073-0889 Appointment Scheduling with Customer Impatience**  
Minshan Song, Student, Southeast University, China  
Yulin Zhang, Professor, Southeast University, China

We study an appointment scheduling problem with impatient customers. The result shows that the optimal arrival time intervals become longer as impatient rate reduces. In addition, impatient behavior can be costly if neglected.

**197 073-0903 Modeling of Dual-Cycle Problem for Quay Crane and Yard Truck Scheduling with Mixed Storage Strategy**  
Yu Shucheng, Student, Shanghai university, China

This paper uses the dual-cycle strategy considering the quay crane and yard truck scheduling problem and cooperates with a mixed storage strategy to improve the efficiency of quay crane operations and horizontal transportation. The dispatching rules for yard trucks and storage locations for inbound containers are considered.

**073-1181 Soft System Based Framework for Sustainable Freight Transportation**  
Vijaya Tukaram Fulzele, Student, Indian institute of Technology Delhi iIT, India  
Ravi Shankar, Professor, Indian institute of Technology Delhi iIT, India  
Rachita Gupta, Student, Indian institute of Technology Delhi iIT, India
The major challenge for any freight transporter is to effectively develop proper fit between organisation goals and sustainability initiatives. Soft System Methodology has been adopted to design this framework. This fundamental and comprehensive framework helps in better adoption of sustainability in freightage operations.

073-1544  Freight Modal Shift from Road to Waterway: What Matters to Industrial Shippers?
Janaina (Jane) Siegler, Assistant Professor, Northern Kentucky University, United States
Ricardo Martins, Professor, Federal University of Minas Gerais, Brazil

Greater Cincinnati and Northern Kentucky area ranks in the US Top-10 markets for Fortune-500 headquarters per million residents, higher than NY, Boston, Chicago, or LA. Considering a situation of over-utilized highways, with railroads and waterways with idle capacity, which supply-chains could potentially use the Ohio River-waterway transportation in the region?

198 Saturday, 09:45 AM - 11:15 AM, Evergreen I
Track: Global Supply Chain Management
Session: Global Supply Chain Structures and Management Practices
Chair(s): Raphael Oger

073-1782  Shortening the Length of Supply Chain to Achieve Cost Saving and Higher Security
Istvan Gal, Supply Chain, Toyota Motor Corporation, Hungary

Scientific theory proves the shorter supply chain will run in higher security/ reliability . Also lower costs even if the geographical connection is over continents. Difficulties, transp. and customs issues, L/T shortening, cost saving plans. manufacturers in automotive industry have to give discount from their sales.

073-0502  A Supply Chain Value Driver Decomposition Model for Investigating the Effects of Global Sourcing
Andreas Pumpe, Lecturer, Muenster University of Applied Sciences, Germany
Franz Vallée, Professor, Muenster University of Applied Sciences, Germany

This research presents an application of the Axiomatic Design approach for investigating the effects of global sourcing on supply chains. In this way, the value drivers are operationalized and cause-effect relationships between drivers and outcomes are defined. This model explains how global sourcing can be directed towards value generation.

073-1148  Supply Chain Management: A Comparative Study Between Japan and Vietnam
Anh Phan, Lecturer, VNU - University of Economics and Business, Vietnam
Minh Nguyen, Student, Yokohama National University, Vietnam
Odkhishig Ganbold, Lecturer, National University of Singapore, Singapore
Yoshiki Matsui, Professor, Yokohama National University, Japan

This study aims to investigate the different impact of supply chain management practices on manufacturing capabilities in Japan (a developed country) and Vietnam (a developing country). Empirical analysis results indicated significant different influence of both upstream and downstream supply chain management on quality, cost, on-time delivery, delivery speed and flexibility.

073-1904  S&OP Strengthening by Enabling Logistics Networks Agility and Resilience Improvement
Raphael Oger, Student, Toulouse University, Mines Albi, France
Benoit MONTREUIL, Professor, Georgia Institute of Technology, United States
Matthieu LAURAS, Associate Professor, Toulouse University, Mines Albi, Industrial Engineering Center, France
Frederick BENABEN, Professor, Toulouse University, Mines Albi, Industrial Engineering Center, France

This paper presents a methodology and platform able to guide businesses towards the strengthening of their S&OP through the improvement of their logistics network agility and resilience. Our methodology enables the automation of strengthening actions recommendations, through logistics network modeling, available supply chains processes deduction and simulation, and performance analysis.

199 Saturday, 09:45 AM - 11:15 AM, Grand A
Track: Supply Chain Risk Management
Session: Remanufacturing and Supplier Development
Chair(s): KUNPENG LI

073-0478  Divisional Conflict and Distribution Channel Choice in Remanufacturing Operation
Tianqin Shi, Assistant Professor, San Jose State University, United States
Dilip Chhajed, Professor, University of Illinois Urbana-Champaign, United States
Yunchuan Liu, Associate Professor, University of Illinois Urbana-Champaign, United States
Zhiyi Lan, Associate Professor, University of Oregon, United States

In this paper, we consider a firm that organizes manufacturing and remanufacturing operations in separate divisions. The firm may sell to the consumers both new and remanufactured products directly or through an independent retailer. We examine how the firm’s internal structure affects the distribution channel choice, and vice versa.

073-1011  Game of Investment in a Common Supplier
Youngsoo Kim, Student, University of Illinois Urbana-Champaign, United States
Dharma Kwon, Assistant Professor, University of Illinois Urbana-Champaign, United States
George Georgiadis, Assistant Professor, Northwestern University Kellogg School o, United States

Motivated by manufacturers’ supplier development, we study the two-player waiting game of investment in common supplier who is the channel of investment spillover. Contrary to the past literature, we find inefficient waiting is unlikely to happen in equilibrium. However, we also discuss an extension that can result in inefficient waiting.

073-0456  Optimal Warranty Strategies for Remanufactured Products
Kunpeng Li, Assistant Professor, Utah State Univ, United States
Qianrong Gu, Assistant Professor, Ball State University, United States
Ziping Wang, Assistant Professor, Morgan State University, United States
### 200 Saturday, 09:45 AM - 11:15 AM, Grand B
**Session:** Advances in Management of Sourcing  
**Track:** Purchasing and Supply Management  
**Chair(s):** Anupam Agrawal

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<th>Session</th>
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| 073-0039 | Does Supply Management Capability Vary by Strategic Orientation? | Scott Lichtenstein, Associate Professor, Birmingham City University, United Kingdom  
Marc Day, Professor, Henley Management College, United Kingdom  
Phillip Samouel, Professor, Kingston University, United Kingdom |

We report findings of a study investigating the extent to which routines comprising supply management capability differ by strategic orientation. A number of significant differences in the intensity of procurement routine performance by strategic type are present, along with a confounding effect of strategically unstable (reactor) firms.

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<th>Session</th>
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<tr>
<td>073-0050</td>
<td>Learning and Depreciation of Learning in Supply Chains</td>
<td>Anupam Agrawal, Associate Professor, Texas A&amp;M University College Station, United States</td>
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</table>

We review recent advances in the arena of learning and forgetting in a supply chain. We focus on how buyers and suppliers can create value by focusing on learning, what are the barriers, and how they can deal with spillover of learning.

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<th>Session</th>
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<tr>
<td>073-2033</td>
<td>Tutorial on Asymptotic Analysis of Large-Scale Systems via Graphical Models</td>
<td>Mohsen Bayati, Associate Professor, Stanford University, United States</td>
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</table>

We introduce probabilistic graphical models and message-passing algorithms. Next, we present their applications in statistical learning. These methods have recently been successful in understanding distribution of non-linear estimators in high-dimensional statistics and in community detection. Analysis of these methods has to a new framework for studying discrete stochastic dynamical systems.

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| 073-2067 | Using Automatic Acoustical Analysis to Reduce Costs of Machine Operation by up to 30% | Christian Sebastien, CEO, OtoSense, United States  
Jags Kandasamy, VP Products, OtoSense, United States |

We demonstrate how sounds can be used as a leading indicator in helping monitor operational machinery in real-time, diagnose issues and help enable predictive maintenance to reduce down-time and increase productivity.

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<th>Session</th>
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| 073-0012 | Who Compensates the Sales Agent? | Panos Kouvelis, Professor, Washington University, United States  
Duo Shi, Student, Washington University St Louis, United States |

We analytically study a value chain consisting of three segments: a manufacturer, a retailer, and a sales agent. The performance of five distinct value chain structures are compared. We find that partial value chain integration may be worse than complete value chain decentralization.
Saturday, 09:45 AM - 11:15 AM

**073-0305** Multi-Period Salesforce Compensation: Disaggregate Versus Aggregate Incentive Contracts

Kinshuk Jerath, Associate Professor, Columbia University, United States
Fei Long, Student, Columbia University, United States
Fangruo Chen, Professor, Columbia University, United States

Given that salespeople can dynamically adjust their efforts, we study with what periodicity firms should compensate salespeople. In our model, a risk-neutral principal employs a risk-neutral agent with limited liability for two periods. We find that, aggregate contracts weakly dominate disaggregate contracts for the principal, and early effort is induced.

**073-0965** Design of Sales Force Compensation Schemes to Reduce Product Waste

Arzum Akkas, Professor, Boston University, United States
Nachiketa Sahoo, Assistant Professor, Boston University, United States

We examine sales-force compensation schemes that impact expiration of consumer-packaged-goods (CPG) at retailers to identify incentive-aligning schemes. Using sales commission data from a CPG manufacturer, we investigate the impact of counterfactual schemes based on our model of sales-force selling behavior.

**073-0001** Salesforce Incentives for Managing Product Returns

Rashmi Sharma, Student, Penn State University University Park, United States
Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States

We study a setting where product sales and returns are effort-dependent and the selling activity is conducted by a salesforce. We investigate the effect of salesforce behavior on net sales and compare different incentive schemes to identify optimal incentive strategies.

**073-0209** Analyzing Supply Management Policies for Multiple Relief Items in Emergency Relief Operations

Mahyar Eftekhar, Assistant Professor, Arizona State University Tempe, United States
Jeanette Song, Professor, Duke University Durham, United States
Scott Webster, Professor, Arizona State University Tempe, United States

To fulfill beneficiaries' demands after a sudden-onset disaster, humanitarian organizations should design a cost-efficient and time-effective procurement policy. Analyzing different procurement alternatives, we suggest policies to preposition an optimal level of critical items. Our model takes demand, supply and budget characteristics into account.

**073-0835** Insights and Tools for Implementing Operational Standards in Decentralized Humanitarian Organizations

Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
Erica Gralla, Assistant Professor, George Washington University, United States
Ira Haavisto, Lecturer, Hanken School of Economics, Finland

Contingency theory suggests that organizations operating in an uncertain context should exhibit low centralization and low standardization. Humanitarian operations are indeed decentralized but require standards to provide accountability and drive efficiency. Detailed case studies of standardization initiatives within two large humanitarian organizations offer insights and tools for successful implementation.

**073-0860** A Dynamic Model for Policy Evaluation in Humanitarian Fleet Management

Li Gu, Student, University of Maryland, United States
Ilya Ryzhov, Assistant Professor, University of Maryland, United States
Mahyar Eftekhar, Assistant Professor, Arizona State University Tempe, United States

We develop a stochastic, dynamic multi-attribute resource allocation model for fleet management in humanitarian development programs, which encompasses purchase, sale and vehicle assignment decisions. We empirically estimate demand (mission distances) and vehicle operational costs, and build a simulator to compare different policies. Preliminary results are discussed.

**073-0452** Material Convergence in Humanitarian Operations: Modeling and Simulating Processes Through a Case Study in Brazil

Leonardo Varella, Student, Federal University of Santa Catarina, Brazil
Mirian Goncalves, Assistant Professor, Federal University of Santa Catarina, Brazil

The phenomenon of material convergence in the humanitarian logistics affects negatively the performance of its supply chains. This presentation will show the modeling of logistic processes and discussing its impacts, bottlenecks and possible alternatives simulating scenarios and modifications within the processes.

**073-1711** Disaster Response of Brazilian Navy - A Process Approach

Raphael Lopes, Student, PUC Rio, Brazil
Tharcisio Fontainha, Student, Pontificia Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil
Adriana Leiras, Assistant Professor, Pontificia Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

From a process perspective, this paper presents a study of the Brazilian Navy operations in disaster response. The current legislation, the operations during landslides in Rio de Janeiro in 2011, and the process described in academic literature are compared, revealing the correspondence, gaps, and opportunities of improvement for Brazilian Navy.

**073-1574** Evaluating escape routes in a slum in Brazil using social sciences and engineering concepts

Ireneu Brito Jr, Professor, Universidade De Sao Paulo, Brazil
Michael Silva, Student, Fatec Sao Jose dos Campos, Brazil
Debora Olivato, Lecturer, Cemaden, Brazil

From a process perspective, this paper presents a study of the Brazilian Navy operations in disaster response. The current legislation, the operations during landslides in Rio de Janeiro in 2011, and the process described in academic literature are compared, revealing the correspondence, gaps, and opportunities of improvement for Brazilian Navy.
Due to a history of landslides and fatalities in a slum located in Campos do Jordao (Brazil), it was necessary to create routes so that dwellers could evacuate in an emergency. This work uses concepts of engineering, social cartography and simulation for defining and designing routes in a participatory manner.

073-0056  Competition in Carbon-Offset Markets

Gokce Esenduran, Assistant Professor, Ohio State University, United States

In the globally traded carbon market consumers can purchase voluntary carbon offsets. Offset providers in this market choose the delivery terms as forward-crediting of ex-ante offsets or prompt delivery of existing offsets. We analyze the competition between offset providers and identify their equilibrium choice of delivery terms.

073-0299  Cover-up of Safety Hazards: Delays in Voluntary Product Recalls

Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States
Victor DeMiguel, Professor, London Business School, United Kingdom
Woonam Hwang, Assistant Professor, Hec Paris, France

Product safety regulators often have to rely on manufacturers’ voluntary disclosure of information when investigating product defects. However, manufacturers may not always truthfully report all safety hazard information. In this paper, we investigate how regulators can induce manufacturers to truthfully report any safety issues in a timely manner.

073-0777  Designing Sustainable Products under Co-Production Technology

Yen-Ting Lin, Assistant Professor, University of San Diego, United States
Haoying Sun, Assistant Professor, Texas A&M University College Station, United States
Shouqiang Wang, Assistant Professor, Naveen Jindal School of Management, United States

We study a monopolist firm’s product line decision in the presence of co-production technology and green consumers who value resource conservation. We show the conditions under which the firm should offer green products. In addition, we examine the resource conservation implications of the firm’s decision.

073-0756  Ensuring Corporate Social And Environmental Responsibility Through Vertical Integration And Horizontal Sourcing

Adem Orsdemir, Assistant Professor, University of California Riverside, United States
Bin Hu, Assistant Professor, Kenan-Flagler Business School, United States
Vinayak Deshpande, Professor, University of North Carolina Chapel Hill, United States

We investigate vertical integration as an alternative strategy for ensuring corporate social and environmental responsibility (CSER) in a competitive setting. We find that demand externalities due to violation exposures and the possibility of supplying a competitor may fundamentally change firms’ behaviors and CSER outcome.

073-0877  Distressed Selling by Farmers: Model, Analysis, and Use in Policy-Making

Shivam Gupta, Assistant Professor, Texas State University, United States
Milind Dawande, Professor, UT Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States
Ashutosh Sarkar, Associate Professor, Indian Institute of Management Kozhikode, India

In many developing countries, farmers sell a significant portion of their produce at prices much lower than the guaranteed support price offered by the government. We build a dynamic programming model to analyze and illustrate how it can serve as a useful decision making tool for policy-recommendations.

073-0594  Shaping the Values of a Milk Cooperative: Theoretical and Practical Considerations

Liyi Duan, Assistant Professor, University of Delaware, United States
Milind Dawande, Assistant Professor, UT Dallas, United States
Vijay Mookerjee, Professor, University of Texas Dallas, United States

We study dairy cooperatives from the perspective of a planner who wishes to achieve the simultaneous goals of quantity efficiency (grand coalition is formed), quality efficiency (high quality of milk is supplied by each farmer), and minimal testing. A novel allocation rule is proposed that achieves the above goals.

073-0714  Supply Chain Visibility and Trust in Social Responsibility Communication

Tim Kraft, Assistant Professor, University of Virginia, United States
Leon Valdes, Student, Massachusetts Institute of Technology, United States
Yanchong Zheng, Assistant Professor, Massachusetts Institute of Technology, United States

We conduct an incentivized lab experiment to investigate the role of trust in consumers’ willingness-to-pay for social responsibility. Specifically, we analyze how trust and trustworthiness are affected by the level of visibility that a company has about social responsibility practices in its upstream supply chain.

073-1334  Business Models for Off-Grid Energy Access at the Bottom of the Pyramid

Bhavani Shanker Uppari, Student, INSEAD, Singapore
Ioana Popescu, Associate Professor, INSEAD, Singapore
Serget Netessine, Professor, INSEAD, Singapore
One-fifth of the humankind living without electricity mainly relies on costly kerosene for lighting. Although cheaper rechargeable technologies are available, their adoption is low and some consumers continue to use kerosene. We propose a model which explains this preference for kerosene and explore business models that could alter this preference.

Companies selling through their online channels increasingly offer the option to consumers to customize their products. However, the returns policies for customized products may be very different, spanning from zero to partial to full refund. In this article, we study the determinants of returns policies for customized products.

The path to commercialization for small firms requires accessing outside resources through external R&D initiatives, heightening the risk of intellectual property (IP) leaks as they share proprietary knowledge. We showed how this decision were made at project level investigating 933 firms and 1374 R&D projects.

By enlarging total consumer base, organic products have a spillover effect on their conventional competitors. Therefore, instead of substituting conventional varieties with organic ones, retailers actually increase their conventional assortments during the organic trend. However, the simultaneous increase in variety is constrained by shelf space and store brands.

Notwithstanding the observation that offshoring decisions have proven to be quite vexing in practice, there is a paucity of empirical research on factors influencing the offshoring decision. This study addresses this void by examining theoretically-grounded task and management team characteristics that influence the offshoring decision and corresponding performance.

Kayvan Lavassani, Assistant Professor, North Carolina Central University, United States

073-0155 Drivers and Benefits of Online Retail Return Policies
Guangzhi Shang, Assistant Professor, Florida State University, United States
Pelin Pekgur, Assistant Professor, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States
Michael Galbreth, Professor, University of South Carolina, United States

Consumers returns management draws a lot of academic interests lately. The common analytical result for optimal return policy is a partial refund, which is in sharp contrast with the common retail practice of full refund. We provide empirical evidence to show the two potential explanations for this difference.

We consider a monopolist selling base and/or green product versions to consumers whose differential (dis)utility vary by consumer type, and is a function of the firm's quality decision (the amount of recycled content in the green version.) We discuss how the optimal quality and pricing decisions drive demand and profit

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Kayvan Lavassani, Assistant Professor, North Carolina Central University, United States
The design and management of business processes affects different aspects of organizational performance. Based on an empirical investigation conducted in China, the U.S. and Canada this study identifies the mechanism in which organizations can achieve certain financial, operational and customer satisfaction benefits.

### Session: Time to Reflect - Review and Meta-Studies in BOM

**Chair(s):** Enno Siemsen

#### Session: Review and Meta-Studies in BOM

**212 Saturday, 09:45 AM - 11:15 AM, Regency F**  
Track: Behavior in Operations Management

**073-0133** A Meta-Analysis of Newsvendor Experiments: Revisiting the Pull-to-Center Asymmetry  
Yinghao Zhang, Assistant Professor, University of Cincinnati, United States  
Enno Siemsen, Professor, University of Wisconsin Madison, United States

This study provides a meta-analysis of newsvendor experiments in 22 papers. We show that the asymmetry in the pull-to-center effect between high-margin and low-margin conditions varies significantly among studies. Factors that allow predicting the extent and direction of the asymmetry include loss aversion and feedback provided to subjects.

**073-0933** Cocitation Analysis of Behavioral Operations Management Field  
Jure Erjavec, Assistant Professor, University of Ljubljana, Slovenia  
Peter Trkman, Associate Professor, University of Ljubljana, Slovenia

This paper contributes to an ongoing debate about the current state of behavioral operations management. It uses the Lakatosian view as a ground for its cocitation analysis which identifies the clusters which can be interpreted as either hard core or protective belt of research in this field.

**073-0584** Newsvendor Model and Choice Under Uncertainty: Reflecting on the Past and Looking to the Future  
Blair Flicker, Student, University of Texas Dallas, United States  
Elena Katok, Professor, University of Texas Dallas, United States

After twenty years of sustained behavioral newsvendor research, one of the few universal findings is that human decision-makers place suboptimal orders thereby eroding firm profits. I propose a novel approach to endow subjects with a signal of upcoming demand and explore ways to use this superior information to enhance profitability.

**073-0924** Running Behavioral Operations Experiments using Amazon’s Mechanical Turk Workers  
Yun Shin Lee, Assistant Professor, K A I S T, Korea, Republic of (South Korea)  
Yong Won Seo, Associate Professor, Chung-Ang University, Korea, Republic of (South Korea)  
Enno Siemsen, Professor, University of Wisconsin Madison, United States

Online labor markets such as Amazon Mechanical Turk (MTurk) provide an ideal platform for conducting behavioral experiments because it can produce experimental results more quickly, cheaply, and easily. We review recent research about MTurk and replicate the seminal behavioral operations experiments (inventory planning, procurement auction, contracting) using MTurk.

### Session: Empirical Service Operations and Business Model Innovation

**Chair(s):** Dennis Zhang

#### Session: Empirical Service Operations and Business Model Innovation

**213 Saturday, 09:45 AM - 11:15 AM, Regency G**  
Track: Empirical Research in Operations Management

**073-0134** Examining Service Performance in High-Anxiety Settings  
Michelle Shell, Student, Harvard University, United States  
Ryan Buell, Professor, Harvard University, United States

Many service settings are rife with anxiety, yet the impact of anxiety on service relationships is not well understood. Through a series of experiments, we find that providing self-service customers with access to human contact in high-anxiety settings can improve choice satisfaction, and in turn their trust in the company.

**073-1213** Surviving the Odds - Shocks, Operational Disruption, and Resilience of Micro-enterprises in Emerging Markets  
Amrita Kundu, Student, London Business School, United Kingdom  
Kamalini Ramdas, Professor, London Business School, United Kingdom  
Stephen Anderson-MacDonald, Assistant Professor, Stanford Graduate School of Business, United States

We identify different types of shocks that affect micro-enterprises operating in emerging markets and assess their impact on the businesses. We then examine how specific operational strategies can improve micro-entrepreneurs' resilience to shocks. Our empirical study is based on five detailed surveys of 800 randomly selected micro-enterprises in urban Kampala.

**073-1849** Business Model Innovation Feature Extraction and Application to the Lean Startup Framework  
Christophe Pennetier, Student, INSEAD, Singapore  
Serguei Netessine, Professor, INSEAD, Singapore  
Karan Girotra, Professor, INSEAD, France

Using a new curated dataset with more than half a million startups, we use state-of-the-art text mining and machine learning techniques to identify business model innovations and study their effects on startups’ success.

**073-0018** Information Asymmetry and Discrimination in the Sharing Platform: Field Evidence From Airbnb  
Dennis Zhang, Assistant Professor, Washington University St Louis, United States  
Ruoeng Cui, Assistant Professor, Indiana University Bloomington, United States  
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

We run several field experiments to investigate the role of information in mitigating racial discrimination on sharing economy marketplaces. We find that racial discrimination exists in sharing economy platforms and the dominant mechanism is statistical discrimination. Based on our empirical results, we then provide recommendations on fighting discriminations.
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<th>Session</th>
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<td><strong>073-1149</strong> An Optimization Model for Coordinated Operations of Cold Chain Logistics&lt;br&gt;Gang Du, Professor, Tianjin University, China&lt;br&gt;Shanshan Meng, Student, Tianjin University, China&lt;br&gt;Yixuan Xiong, Student, Tianjin University, China</td>
<td>A 0-1 mathematical programming model is set up in this paper for coordinating operations in cold chain logistics enterprises. The optimization objective is to minimize total cost. The decision variables are optimal decisions for inventory, process and distribution plan. A illustrative example based on a Chinese enterprise is given.</td>
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<tr>
<td><strong>073-0296</strong> How Do Food Supply Chains Become More Sustainable? A Dynamic Capabilities and Ambidexterity Approach&lt;br&gt;Anna Land, Assistant Professor, University of Wisconsin-Whitewater, United States&lt;br&gt;Madeleine Pullman, Professor, Portland State University, United States</td>
<td>This study explores how firms modify their resources when changes related to sustainability occur within the supply chain. Using data from a potato supply chain where the manufacturer is pushed by retailers to implement various sustainability standards, the research identifies particular dynamic capabilities adopted to confront the changing business environment.</td>
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<td><strong>073-1841</strong> Design of DSS for Forecasting Demand for Food at a Religious Organization&lt;br&gt;Venkataramanaiah Saddikuti, Associate Professor, Indian Institute of Management Lucknow, India&lt;br&gt;Debabrata Das, Professor, Indus Business Academy, India</td>
<td>An application of ARIMA model for demand forecast of food at a religious organization has been presented. A decision support system model has been proposed for planning and procurement of various agro-commodities. Key managerial insights have also been highlighted.</td>
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<td><strong>073-1430</strong> How Does Social Orientation Influence Firm Innovation?&lt;br&gt;Xiaojin Liu, Student, University of Virginia, United States&lt;br&gt;Raul Chao, Associate Professor, University of Virginia, United States</td>
<td>This research addresses the questions of whether and how firm social orientation relates to firm innovation and, in so doing, identifying the specific mechanisms pertaining to the proactive and reactive social orientations. Integrating large scale archival datasets on social performance rating and firm innovation, we empirically investigate the research questions.</td>
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<td><strong>073-0463</strong> Incentives for Recycling Infrastructure Development Under Extended Producer Responsibility&lt;br&gt;Luyi Gui, Assistant Professor, University of California Irvine, United States</td>
<td>Producers' investment and effort in building recycling infrastructure can be observed in practice especially in developing countries where such infrastructure is missing. Motivated by these examples, this paper studies the cost efficiency and environmental impact such as producers' eco-design incentives when infrastructure investment decisions are endogenized.</td>
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<td><strong>073-1418</strong> Uncertain Market Value for Green Products: Designing for the Environment&lt;br&gt;Jeremy Kovach, Assistant Professor, Texas Christian University, United States</td>
<td>We examine the impact on a firm's green product development initiatives given a market's uncertain willingness to pay for environmentally conscious products. We examine these effects under a duopoly setting to understand how competition and uncertainty influence product design.</td>
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<td><strong>073-0199</strong> Identity of the Worker for Sustainability in Ridesharing Business Models&lt;br&gt;Sinan Erzurumlu, Associate Professor, Babson College, United States</td>
<td>In this research we explore the interactions between the workers and firm in on-demand economy. We analyze survey data to understand the relationship-specific norms and expectations between the worker and the firm in on-demand economy through the lens of psychological contracting and social identity theories.</td>
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<td><strong>073-1173</strong> Performance Contagion in Technology Outsourcing Communities&lt;br&gt;Aditya Karanam, Student, The University of Texas at Austin, United States&lt;br&gt;Rajib Saha, Assistant Professor, Indian School of Business, India</td>
<td>We hypothesize that the implementation of a strategic technology outsourcing contract situates the focal client and the vendor in a larger community of firms with interdependent risks and payoffs causing performance within communities to co-move. Our results support the networked nature of value chains and their quantitative relevance to firm performance.</td>
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<td><strong>073-1903</strong> Improving the Repair and Maintenance Work Order Process at a VA Hospital&lt;br&gt;M Montazer, Professor, University of New Haven, United States&lt;br&gt;Scott Weber, Student, University of New Haven, United States&lt;br&gt;Kimberly Severino, Quality Improvement Specialist, VA Hospital, United States</td>
<td>The current method of tracking repair work order is through a computer program that requires input from personnel to keep track of the work order status. This creates long delays in the process and adds to the frustration of the users. This paper introduces a workflow approach to repair work orders that provides a user-friendly, easy access to the process. This approach is expected to improve the process and make it more efficient.</td>
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The maintenance work ordering process at a VA-Hospital was studied. The process was benchmarked with a comparable improved process at a sister hospital. Upon data collection which included surveys and interviews, a lean process was designed and implemented, which is enthusiastically accepted by personnel with significantly improved performance metrics.

073-0608 Reciprocity Styles and Student Participation on MOOCs
Aravinda Garimella, Student, University of Washington, United States
Ming Fan, Professor, University of Washington, United States

MOOCs are platforms of collaborative learning that heavily rely on student interaction. We study the effect of students' reciprocal types on the nature of their interaction with peers. Our analysis is conducted on a rich data set of student conversations over a period of over three years on Khan Academy.

073-1770 Does Technology Substitute for Nurses? Staffing Decisions in Nursing Homes
Feng (Susan) Lu, Assistant Professor, Purdue University, United States
Huaxia Rui, Assistant Professor, University of Rochester, United States
Abraham Seidmann, Professor, University of Rochester, United States

In this paper, we study the effect of IT-enabled automation on staffing decisions in healthcare facilities. Using unique nursing home IT data from 2006 to 2012, we find that the licensed nurse staffing level decreases by 5.8% in high-end nursing homes but increases by 7.6% in low-end homes.

217 Saturday, 09:45 AM - 11:15 AM, Birch
Session: Emergency and Relief Operations
Track: General/Emerging Topics in Operations Management
Chair(s): Jyotirmoy Dalal

073-2057 Information Sharing in Omnichannel Retailing
Jianghua Wu, Professor, Renmin University of China, China
Yuan Xue, Student, Renmin University of China, China

We study the information sharing regarding uncertain demand between direct channel and indirect channel in omnichannel retailing. We show that both channel substitutability and demand variance can affect incentives to share information.

073-2058 Information Sharing Strategy Among Competing Manufacturers With Capacity Constraints
Jianghua Wu, Professor, Renmin University of China, China
Fan Jiang, Student, Renmin University of China, China

We study competing manufacturers' horizontal information sharing strategy under capacity constraints in a two-echelon supply chain. We show that how upstream supplier can use the price to influence downstream manufacturers' choice of information sharing in a way to maximize its own profit.

073-1394 Emerging Field of Micro-Operations - Coming Full Circle with the Confluence of Crowdsourcing and IS
Milind Padalkar, Professor, BENNETT UNIVERSITY, India
Saji Gopinath, Professor, Indian Institute of Management Kozhikode, India

Throughout its evolution, Operations Management has sought economic efficiency while delivering to specific customer needs. We review trends in information systems, manufacturing technologies, crowdsourcing and organizational networks, and argue micro-operations as the next step in the field's evolution. We present a framework to situate case examples and discuss future possibilities.

218 Saturday, 09:45 AM - 11:15 AM, Auditorium
Session: Empirical Investigations at OM-Marketing interface
Track: Marketing and Operations Management Interface
Chair(s): Zuozheng Wang

073-1363 An Empirical Analysis of Diversification in the Mobile App Market
Maria Vasi, Student, Universita Degli Studi Di Palermo, Italy
Paolo Roma, Assistant Professor, Universita Degli Studi Di Palermo, Italy

In this paper we address the study of the effects of product line diversification on firm sales performance in the mobile application market. We compare the sales performance of diversified developers with that of category-specialized developers in major app stores.

073-1728 Predicting the Customer Response Rate in Direct Marketing: An Empirical Bayes Approach
Young Chun, Professor, Louisiana State University, United States

Various estimation methods have been proposed to predict the total number of customer responses over time. We propose an Empirical Bayes method that uses the response data to estimate the parameters of a prior distribution. We show that the EB method outperforms other existing methods such as the MLE.

073-0988 Geography Still Matters: Examine the Role of Location in Online Markets for Foreign Branded Products
Xia Zhao, Associate Professor, University of North Carolina Greensboro, United States
Kexin Zhao, Associate Professor, University of North Carolina Charlotte, United States
Jing Deng, Associate Professor, University of North Carolina Greensboro, United States

This study investigates whether and how geographic location affects online sellers' pricing strategies and sales for foreign branded products using a large data set collected from a brand owner's websites and an e-commerce retail platform. The results show that origin location advantage exists and geography still matters in online platforms.

073-1702 Assessing the Consequences of Outsourcing: Structural Estimation From the U.S. Airline Industry
Zuozheng Wang, Student, University of Maryland, United States
Martin Dresner, Professor, University of Maryland, United States

Existing empirical research on the impact of outsourcing decisions is all based on reduced form models, which ignore the endogenous decision process. This study proposes a structural model that could capture a firm’s profit-maximizing behavior. Policy simulation based on empirical data provides a workable tool to predict performance of outsourcing.
073-0641 Assuming My Curly Hair: A Study on Consumption and Production of Identity
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Raniele Gomes, Student, Faculdade Santo Agostinho, Brazil
   Maria Luisa Moreira, Student, Faculdade Santo Agostinho, Brazil
This study aims to understand the meanings associated with the consumption of products/services for curly hair in the female audience. The results propose the creation of commercials and packaging that highlight the identity of these women who assume their curls.

073-1884 The Impact on the Cosmetics Industry of Male Narcissism's Spread Embodied by the Post-Industrial Society
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Ana Caroline Sousa, Student, Faculdade Santo Agostinho, Brazil
   Ricardo Sousa, Student, Faculdade Santo Agostinho, Brazil
This article aims to understand the relationship between narcissism and consumption of cosmetics by the male audience. Estimates indicate that in the future Brazilian men will be world leaders in this consumption. Industries must extend their male product portfolios, supplying the growing demand for unique products, providing a greater mix.

073-1307 Identity Change And Beauty Production: Meanings Associated With The Consumption Of Beauty Products By Transvestites
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Karina Barradas, Student, Faculdade Santo Agostinho, Brazil
The aim of this research is to understand the meanings associated with the consumption of beauty products by transvestites. The results demonstrate how the beauty industry can use the elements of identity change associated with the consumption of these products in their marketing communication.

073-0694 Strategic Inventory When a Retailer Sells Partially Substitutable Products
   Abhishek Roy, Student, McCombs School of Business, United States
   Stephen Gilbert, Professor, University of Texas Austin, United States
   Guoming Lai, University of Texas Austin, United States
Although the impacts of strategic inventory are well known, most existing research focuses on bilateral monopolies. We show that when a retailer sells partially substitutable products from different suppliers, many of the findings for strategic inventory in bilateral monopolies are altered.

073-0677 Selling to Multiple Retailers: Supplier’s Perspective on Market Structure
   Yuhong He, Assistant Professor, California State University Fullerton, United States
   Saimal Ray, Professor, McGill University, Canada
   Shuya Yin, Associate Professor, University of California Irvine, United States
This paper aims to explore supplier’s preference over its downstream retailers’ market share dominance, especially when the market share might be correlated to their bargaining powers. We address this issue and establish the supplier’s preference for a monopoly value chain as well as when there is chain-to-chain competition.

073-1450 Managing Sales of a Complex New Product Though Competing Brokers
   Vahideh Abedi, Assistant Professor, California State University Fullerton, United States
   Rahul Bhaskar, Professor, California State University Fullerton, United States
Purchase of complex new products (e.g., insurance plans) typically depends on customer word-of-mouth about the product and about the service quality of offering brokers, which leads to a free-riding effect between the brokers. We model this sales process and analyze its use for design of incentive plans for brokers.

073-0403 Exploring The Rational Behind Outlet Stores
   Jiaru Bai, Student, University of California Irvine, United States
   Haresh Gurnani, Professor, Wake Forest University, United States
   Shuya Yin, Associate Professor, University of California Irvine, United States
In this project, our goal is to understand the tradeoffs involved in offering outlet stores. In particular, we study how much differentiation should be kept between the main and outlet stores from three perspectives: price, product, and location.

073-0649 Compulsive Consumption by Women of the Emerging Middle Class: Meanings in the Purchase of Make-Up
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Maria Luisa Moreira, Student, Faculdade Santo Agostinho, Brazil
   Raniele Gomes, Student, Faculdade Santo Agostinho, Brazil
The objective was to analyze the meanings attributed to the compulsive consumption of makeup by women of the emerging middle class. This purchase may offer temporary satisfaction. It’s proposed that the industries produce samples of makeup for these consumers to experience the purchase, anticipating the feeling of security by possession.

073-0641 The Impact on the Cosmetics Industry of Male Narcissism's Spread Embodied by the Post-Industrial Society
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Ana Caroline Sousa, Student, Faculdade Santo Agostinho, Brazil
   Ricardo Sousa, Student, Faculdade Santo Agostinho, Brazil
This article aims to understand the relationship between narcissism and consumption of cosmetics by the male audience. Estimates indicate that in the future Brazilian men will be world leaders in this consumption. Industries must extend their male product portfolios, supplying the growing demand for unique products, providing a greater mix.

073-1307 Identity Change And Beauty Production: Meanings Associated With The Consumption Of Beauty Products By Transvestites
   Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
   Karina Barradas, Student, Faculdade Santo Agostinho, Brazil
The aim of this research is to understand the meanings associated with the consumption of beauty products by transvestites. The results demonstrate how the beauty industry can use the elements of identity change associated with the consumption of these products in their marketing communication.
### 073-0053 Can We Create Within-Day Work Breaks From Available Idleness?
Xu Sun, Student, Columbia University, United States
Amy Whitt, Professor, Columbia University, United States

We first show that current server-assignment rules in customer contact centers do not produce enough within-day work breaks. We then develop three dynamic priority rules and show through simulations that these new rules can create adequate within-day work breaks from available idleness for service representatives in a customer contact center.

### 073-0071 Dynamic Matching for Real-Time Ridesharing
Erhun Ozkan, Student, Marshall School of Business, United States
Amy Ward, Professor, Marshall School of Business, United States

Participants in real-time ridesharing services such as Uber, Lyft, etc. arrive stochastically over time and must be matched. We propose a linear programming based matching heuristics and prove its asymptotic optimality in ridesharing systems with high volumes of demand, under the condition that drivers are in some sense "scarce".

### 073-0172 On the Rise of the Blended Workforce: Should You Hire Employees or Independent Contractors?
Jing Dong, Assistant Professor, Northwestern University, United States
Rouba Ibrahim, Associate Professor, University College London, United Kingdom

The rise of the blended workforce in the gig economy is prompting companies to reevaluate their staffing models. We study the optimal staffing of service systems hiring a blend of independent contractors and full-time employees, and characterise the trade-offs between supply uncertainty, the quality of service, and operating costs.

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### 222 Saturday, 09:45 AM - 11:15 AM, Laurel
**Session:** Research on Professional Services
**Chair(s):** Iain Reid

### 073-1175 Barriers to Lean Implementation and Sustainability In Healthcare: An Exploration Beyond the Ostensible
Higor Leite, Student, Loughborough University, United Kingdom
Nicola Bateman, Professor, Loughborough University, United Kingdom
Zoe Radnor, Professor, University of Leicester, United Kingdom

The barriers to implement lean in healthcare have been well established from research over the last few decades. However, during an investigation within the Brazilian public healthcare, these barriers were identified as ‘ostensible’, and root causes involving elements, such as patient, healthcare system, physicians and staff members have emerged.

### 073-1080 Facilitating and Difficult Factors in the Relationship Between a Vehicle Dispatching Company and Its Customers
Mark Tunu, Student, Universidade Municipal de Sao Caetano do Sul, Brazil
Milton Farina, Professor, USCS, Brazil
Davis Alves, Professor, USCS, Brazil

This paper aims to show the interorganizational relationship between a vehicle dispatcher company and its main customers. Factors that facilitate and make difficult expose what should be improved and avoided in the provision of services.

### 073-0504 Exploring Service Modularity Through Value Optimisation: The Case of Legal Services
Iain Reid, Senior Lecturer, University of Huddersfield, United Kingdom
David Bamford, Professor, University of Huddersfield, United Kingdom
Murray Dalziel, Professor, University of Baltimore, United States

As legal firms face more financial economic challenges of increasing service variation, volume and complexity. This paper presents a theoretical framework of service similarity and reuse within a UK legal partnership. This research also debates the robustness of the UK’s legal network and draws comparisons with the US legal system.

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### 223 Saturday, 09:45 AM - 11:15 AM, Larch
**Session:** Consumer Behavior in Operations Management
**Chair(s):** Pnina Feldman

### 073-0789 Omnichannel Service Operations with Online and Offline Self-Order Technologies
Fei Gao, Student, University of Pennsylvania, United States
Xuanming Su, University of Pennsylvania, United States

Many restaurants have recently implemented self-order technologies across both online and offline channels. We study the impact of both online and offline self-order technologies on consumer demand, employment levels, and restaurant profits.

### 073-1088 An Empirical Investigation of Gift Card Promotions
Bharadwaj Kadiyala, Student, University of Texas Dallas, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States
Serdar Simsek, Assistant Professor, University of Texas Dallas, United States

Gift cards have become a popular vehicle for promotional campaigns run by many departmental, consumer electronic, and online retail stores. Using a proprietary data set from a large department store, we investigate how customers respond to these promotions as well as its effectiveness as a promotional vehicle for retailers.

### 073-1862 Resource Allocation Optimization Strategies of Product and Service Package
Liping Liu, Student, Southeast University, China
Lindu Zhao, Southeast University, China

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As manufacturing servitisation is gradually attracting considerable attention, the resource allocation strategy has become one of the most important research areas in manufacturing. This paper aims at constructing a mathematical model to analyze resource allocation optimization strategies of product and service package on the basis of consumer utility theory.

**073-0822** Omничannel Retail and Inventory Integration with Strategic Consumers

Arian Aflaki, Student, Duke University Durham, United States
Robert Swinney, Associate Professor, Duke University Durham, United States

We study the value of channel and inventory integration for a firm selling a good over two periods. Consumers are strategic in two ways: they decide whether and when to visit the firm based on their cost of visiting the firm, the price of the product, and its anticipated availability.

**073-1245** Producing Beautiful Hair: Meanings Associated with Consumption of Definitive Hair Straightening Methods by Women

Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
Cinzia Oliveira, Student, Faculdade Santo Agostinho, Brazil

This research aims to understand the meanings associated with the use of definitive hair straightening methods by women. The results demonstrate: How these women use non-legalized products with the objective of better results; And how industries can use less harmful chemicals to hair strands and health.

**073-0060** Mobile-Based Case Simulations for Learning P/OM Through Deep Immersion

Luis Lopez, Professor, INCAE, Costa Rica
Hans Gatgens, CTO, ProcessimLabs, Costa Rica
Javier Chan, COO, ProcessimLabs, Costa Rica

We describe the first mobile-based case-simulation P/OM learning environment. The case study and accompanying simulator conform a data-rich learning environment that gives students an opportunity to build skills in crafting and executing operations plans and learn P/OM concepts. Post-game survey data show high level of student involvement and improved learning.

**073-0153** Engaging Student Learning Through Gamification in an Introductory Operations and Supply Chain Management Course

Koray Ozpolat, Associate Professor, University of Rhode Island, United States
Hee Yoon Kwon, Student, University of Rhode Island, United States

We are developing a game-like introductory operations course and plan to explore the impact of gamification on learning outcomes by comparing results to a conventional operations course. Game elements that use digital media tools will enable students to collaborate and compete through a series of well-defined learning challenges.

**073-1256** The Process of Internationalization of Higher Education: Forecasting Future Trends of Virtual Environments (UNAH)

Taria Andino Ruiz, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras
Julio Zavala, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras
Cesar Ortega, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras

The adaptation of higher education to the virtual modality is an important practice for the internationalization of higher education. In Honduras it has been implemented as a practice to increase service. This study shows the efficiency and future trends of the transfer of knowledge through virtual environments at UNAH.

**073-1142** The Value of Energy Storage in Renewable Energy Integration

Shanshan GUO, Assistant Professor, Shanghai Univ. of Finance and Economics, China
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
Gilvan Souza, Professor, Indiana University Bloomington, United States

Energy storage can be used to shift electricity from the time it is generated to a later time when the electricity is needed. We study the value of using energy storage in such way to mitigate the intermittency of electricity generated by renewable resource.

**073-1505** Efficiency of Supply Function Equilibrium in Networked Markets

Yuanzhang Xiao, Student, Northwestern University, United States
Chaitanya Bandi, Assistant Professor, Northwestern University, United States
Ermin Wei, Assistant Professor, Northwestern University, United States

We study the efficiency loss of the supply function equilibrium (SFE), in markets where the demand is inelastic, the suppliers submit their supply functions, and a uniform price is set to clear the market. We study how the network topology affects the efficiency of SFE.

**073-1017** Mechanism Design for Reliability in Demand Response with Uncertainty

Yingying Li, Student, Harvard University, United States
Na Li, Assistant Professor, Harvard University, United States

We consider a two-stage demand response (DR) program with uncertain user cost functions. We design an outcome-contingent mechanism where users report their private types and an aggregator selects DR customers. The mechanism guarantees both incentive compatibility and individual rationality. In addition, it ensures high reliability of the DR.

**073-0026** An Analysis of Demand Response Programs in the Wholesale Electricity Market

Baris Ata, Professor, University of Chicago, United States
Asilgul Duran, Student, Northwestern University, United States
This project explores the impact of the participation and compensation of demand response (DR) providers in the wholesale electricity market on the generation portfolio, electricity prices and social welfare. Specifically, we model a supply function equilibrium under varying compensation rates of DR providers.
Saturday, 01:30 PM - 03:00 PM

**229**

**Saturday, 01:30 PM - 03:00 PM, Evergreen A**

**Session:** Studies in Improving Hospital Operations  
**Chair(s):** Robert Batt  
**Track:** Healthcare Operations Management

**073-1595** Optimization of Decentralized Pharmaceuticals Inventory in Hospitals Wards  
Gregory Dobson, Associate Professor, University of Rochester, United States  
Vera Tilson, Associate Professor, University of Rochester, United States  
We propose an integer programming formulation for minimizing costs of managing decentralized pharmaceuticals inventory in hospitals wards under a storage capacity constraint.

**073-1648** Design and Analysis of a Joint Pain Integrated Practice Unit Using Simulation  
Douglas Morrice, Professor, University of Texas Austin, United States  
Jonathan Bard, Professor, University of Texas Austin, United States  
Karl Koenig, Professor, The University of Texas, Austin, United States  
An important strategy for delivering high-value, patient-centered care is for providers to organize into dedicated teams around a patient's condition and provide a full cycle of care in an Integrated Practice Unit (IPU). We present results of a simulation study on the design and analysis of a joint pain IPU.

**073-1749** An Empirical Study of Adding Physician Assistants to Rapid Response Teams  
Mor Armony, Associate Professor, New York University, United States  
Carri Chan, Associate Professor, Columbia University, United States  
Yunchao Xu, Student, New York University, United States  
Staffing healthcare systems with physician assistants can sometimes be cost-effective, but their impact on critical care delivery remains unclear. We empirically measure their impact with part-time versus full-time coverage and find that adding weekday physician assistants reduces time-to-transfer. Interestingly, we do not find evidence on further benefits with additional coverage.

**073-1049** An Econometric Analysis of How Facility Layout Impacts Care Provision in the Emergency Department  
Lesley Meng, Student, The Wharton School, United States  
Robert Batt, Assistant Professor, University of Wisconsin Madison, United States  
Christian Terwiesch, Professor, The Wharton School, United States  
We study how the facility layout of ED patient rooms impacts nurse workflow decisions. Specifically, linking infrared nurse location tracking data to room occupancy patient data, we are able to investigate potential facility layout variables, such as distance from the nurses' station, that impacts the patient's ED LOS.

**230**

**Saturday, 01:30 PM - 03:00 PM, Evergreen B**

**Session:** Process improvement in healthcare  
**Chair(s):** Paul St. Jacques  
**Track:** Healthcare Operations Management

**073-0272** Process Improvement in Long Term Care  
Keith Willoughby, Associate Professor, University of Saskatchewan, Canada  
Ryan Krug, Student, University of Saskatchewan, Canada  
While long term care and process improvement have both received exposure in academic literature, there is very little material combining the subjects. We investigate the combination of these two topics within a particular Canadian health region, and uncover best practices for improvement in long term care.

**073-0851** Does Lean Work in Healthcare?: Evidence from US Hospitals  
Yong-Taek Min, Assistant Professor, Florida Gulf Coast University, United States  
Jay Kim, Associate Professor, Boston University, United States  
Joseph Restuccia, Professor, Boston University, United States  
Michael Shwartz, Professor, Boston University, United States  
We examine how effective Lean is in improving quality performance in healthcare. We analyze survey data from nationwide hospitals and multiple CMS data sets to present new insight on Lean healthcare principles and their impact on quality performance.

**073-0357** Improving Postoperative Patient Satisfaction Data Collection with an Automated Multimodal Polling System  
Paul St. Jacques, Professor, Vanderbilt University, United States  
Buffy Krauser Lupear, CRNA, Sr Quality & Patient Advisor, Medical Center, United States  
Efforts to improve perioperative quality and service recovery are dependent on collecting postoperative patient satisfaction information. We report on the implementation of a multimodal automated data collection system at an academic medical center. This system has improved the number of patients contacted and the depth of data collected.

**231**

**Saturday, 01:30 PM - 03:00 PM, Evergreen C**

**Session:** Marketing Decisions in Supply Chains  
**Chair(s):** Salma Karray  
**Track:** Supply Chain Risk Management

**073-1606** Who Should Buy Guarantees? A Study of Time Definite Guarantees When Selling to Strategic Consumers  
Juzhi Zhang, Lecturer, University of Science and Technology of China, China  
Qinglong Gou, Associate Professor, University of Science and Technology of China, China  
We build a newsvendor model where an online retailer sells products to strategic consumers via the delivery service offered by an express provider. We study two types of time-definite guarantees, i.e., consumer paying for guarantee and retailer paying for guarantee and investigate the role of them in supply chain management.

**073-0301** Cooperative Advertising for Substitutes in a Non-Cooperative Supply Chain
We explore a supply chain with a retailer of partial substitutes, supplied by two competing manufacturers, where the retailer employs cooperative advertisement and sets retail price. We explore variety of possible games under both Nash and Stackelberg equilibrium between the retailer and the two manufacturers. Insights and conclusions are presented.

Cooperative Advertising for Competing Manufacturers: The Impact of Long-Term Promotional Effects
Salma Karray, Associate Professor, University of Ontario Institute of Technology, Canada
Simon-Pierre Sigue, Professor, Athabasca University, Canada
Guimar Martin-Herran, Professor, Valladolid University, Spain

The effectiveness of cooperative advertising programs is studied in a market where two competing manufacturers deal with an exclusive retailer and two products. Two two-stage game theoretic models are developed to analyze the long-term effects of retailer's promotions, which can be positive or negative, on the effectiveness of cooperative advertising.

Baofeng Zhang, Student, University of Science and Technology of China, China
Desheng Wu, Professor, Stockholm Business School, Sweden
Pin Zhou, Student, Huazhong University of Science & Technology, China
Liang Liang, Professor, University of Science and Technology of China, China

This study examines how supply risk and capital constraint affect the operational strategies of the supply chain under buyer financing. Two cases, i.e., the supplier or the retailer decides the level of green investment are explored, respectively.

Scott DuHadway, Assistant Professor, Portland State University, United States
Steven Carnovale, Assistant Professor, Portland State University, United States
Vijay Kannan, Professor, Utah State Univ, United States

This study investigates supply chain risk management decision-making by using risk compensation theory as a lens. The study advances an experiment that tests how participants' future decision making will change under the presence of increased/decreased risk levels.

Sabine Baumann, Professor, Jade University, Germany
Oliver Eulenstein, Professor, Iowa State University, United States
Kevin Scheibe, Associate Professor, Iowa State University, United States
Christoph Wunck, Professor, Jade University, Germany

We investigate multi-tier supply networks to detect critical patterns, i.e. connections with high potential for negative effects if removed or faulty. Modified networks with fewer or no hotspots or stabilizing emergency-edges can provide more resilient networks for specific customer requests and hence help to effectively manage their inherentness.

Kefeng Xu, Associate Professor, University of Texas San Antonio, United States
Yan Dong, Associate Professor, University of South Carolina, United States
Jayanth Jayaram, Professor, University of South Carolina, United States
Sining Song, Student, Arizona State University Tempe, United States

Firms face various risks that counter the prevailing trend of pursuing "lean". We empirically examine how a firm's external risk interacts with its internal financial risk and risk buffers to impact on the firm's demand side risk. Buyer-supplier perspectives in industry sectors with different supply chains are closely investigated.

Bo Li, Assistant Professor, Ningbo Supply Chain Innovation Institute, China
Antonio Arredola-Risa, Associate Professor, Texas A&M University College Station, United States

We consider a firm that purchases from a supply source with random available capacity and aims to maximize its own firm value. We find that capacity randomness does not impact the optimal order quantity. However, we discover that capacity randomness does impact firm value, sometimes significantly, which deserves process improvement.

Mostafa Rezaei, Student, University of Alberta, Canada
Michele Samorani, Assistant Professor, Santa Clara University, United States
Armin Ingolfsson, Associate Professor, University of Alberta, Canada

We model a single server queueing system with deterministic service times that takes into account patient unpunctuality. Patients can arrive early, on-time, late, or fail to show up. We provide solutions to state probabilities and net clinic utility. Different overbooking rules are compared under the model's assumptions.

Linda LaGanga, VP of Quality & Informatics, Mental Health Partners, United States
We show how we engage clinical providers in achieving organizational productivity targets and their valued service goals. Our synthesis and explanation of scheduling choices, along with interactive consultation and analytical dashboards, boost interest and effectiveness among clinicians in adoption of rigorously researched and tested appointment scheduling techniques.

**073-1516 Sequential Overbooking Strategies in Outpatient Specialty Clinics with No-Shows and Advance Cancellations**
Shannon Harris, Assistant Professor, Ohio State University, United States
Jerold May, Professor, Joseph M. Katz Graduate School of Business, United States
Luis Vargas, Professor, Joseph M. Katz Graduate School of Business, United States

We develop strategies that state how to sequentially overbook patients in a clinic day, over a finite multi-day horizon. Our model incorporates clinic parameters, no-shows, and cancellations to inform the strategies. We find that cancellations affect overbooking rules, and should not be ignored or grouped with no-shows in overbooking analysis.

**073-0962 Appointment Scheduling With Multiple Providers And Stochastic Service Times: A Real-World Implementation**
Mohamad Soliani, Student, University of Wisconsin Madison, United States
Michele Samorani, Assistant Professor, Santa Clara University, United States
Bora Kolfal, Associate Professor, University of Alberta, Canada

We consider a multi-server appointment scheduling problem in which patients may not show up, and those who show up require stochastic service times. We develop both an exact solution method and a heuristic solution method. We implement our procedure at a legal center in Canada.

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**Are OM & SCM Converging? A Bibliometric Analysis**
David Barnes, Professor, University of Westminster, United Kingdom
Alain Pilkington, Professor, University of Westminster, United Kingdom

With globalization, the supply chain has increasingly become the nexus of operations management. The paper assesses the extent to which OM and SCM are converging into a common discipline using bibliometric analysis to compare changes in the content of the leading OM and SCM journals over the last twenty years.

**Designing Electronic Markets for Transportation Services in Korea**
Arin Park, Student, Rutgers University, United States
Yao Zhao, Professor, Rutgers University, United States

There are many trucker strikes since 2002 in Korea. The competitiveness of the trucking industry is weaker than other freight modes because of inefficient market structure. We design an electronic market mechanism for transportation services to improve market efficiency using two-sided matching model.

**“Where the Streets Have No Name”: Last Mile Practices in Brazilian Slums**
André Luis Duarte, Professor, Insper Institute for Education and Research, Brazil
Lars Sanches, Professor, Insper Institute for Education and Research, Brazil
Michele Esteves Martins, Student, Fundacao Getulio Vargas, Brazil
Cristiano Flores e Silva, Student, Insper Institute for Education and Research, Brazil
Guilherme Martins, Professor, Insper Institute for Education and Research, Brazil

Last mile delivery is a great challenge for most companies; reach 53 million customers of Bottom of Pyramid inside the Brazilian Slums (UN-Habitat, 2010) is even more challenging. Based on ten case studies, this paper examines how firms overcome logistical difficulties to distribute products in communities living in slums.

**Power Use Influence on Lower-Tier Sustainability Compliance**
Sherwat Ibrahim, Associate Professor, American University in Cairo, Egypt
Yasmine Henawy, Assistant Professor, American University in Cairo, Egypt

Critical factors have been identified in the literature affecting sustainability of lower-tier suppliers. This study explores the use of different mediating and non-negotiating power influences on the sustainability compliance of suppliers and sub-suppliers. Contextual factors related to geographical and culture distance will be investigated in a global supply chain setting.

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**How to Effectively Use Predictive Analytics in Supply Chain Environments**
Brian Galli, Professor, Long Island University, United States

Efficient flow of a company's value chain comes from Supply Chain Management (SCM), a complex, overlooked component of operations management. Predictive analytics develops improvement strategies that predict supplier performance and plan supplier involvement. It also tests change in a simulated environment. This will improve value chain operation and resource management.

**Development of the "Smart Cities Innovation Hub": A Social Value Platform to Support Local Government**
Yasmine Henawy, Assistant Professor, American University in Cairo, Egypt
Michele Esteves Martins, Student, Fundacao Getulio Vargas, Brazil
Guilherme Martins, Professor, Insper Institute for Education and Research, Brazil
Brian Bishop, CEO, DPC Limited, United Kingdom

This research reviews Smart City initiatives, to enable big data analytics functionality. The aim of the research is to enable IoT data aggregation from sensors in the energy, transport and Healthcare sectors and optimizing the associated services delivering social value in support of citizen’s needs and requirements.

**Pricing of Wine Futures and Newly Bottled Wines Under Weather Uncertainty**
Brian Bishop, CEO, DPC Limited, United Kingdom
### 237  Saturday, 01:30 PM - 03:00 PM, Grand A  
**Session:** Meet the POMS Editors  
**Chair(s):** Subodha Kumar

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<tr>
<td>073-2052 Meet the POMS Editors</td>
</tr>
<tr>
<td>Subodha Kumar, Professor, Texas A&amp;M University College Station, United States</td>
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Conference participants are invited to meet the Production and Operations Management Journal’s departmental editors and the editor-in-chief to discuss any publication issues. All are welcome.

### 238  Saturday, 01:30 PM - 03:00 PM, Grand B  
**Session:** Behavioral Supply Management  
**Chair(s):** Thomas Kull

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<tr>
<td>073-0959 The Influence of Intellectual Property Rights on Poaching in Manufacturing Outsourcing</td>
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<tr>
<td>Keith Skowronski, Assistant Professor, University of South Carolina, United States</td>
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<td>WC Benton, Professor, Ohio State University, United States</td>
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</table>

Using multi-country dyadic buyer-supplier data, we empirically examine how intellectual property rights affect supplier poaching. We find that IP rights have a direct effect on poaching and that IP rights moderate the relationships that two transaction characteristics, supplier investments in specialized assets and media rich communication, have with poaching.

### 238  Saturday, 01:30 PM - 03:00 PM, Grand B  
**Session:** Behavioral Supply Management  
**Chair(s):** Thomas Kull

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<th>Track: Purchasing and Supply Management</th>
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<tr>
<td>073-0990 Winning the Bid: Competition in NPD Contracting</td>
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<tr>
<td>Hubert Pun, Assistant Professor, University of Western Ontario, Canada</td>
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<tr>
<td>Dina Ribbink, Assistant Professor, University of Western Ontario, Canada</td>
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<tr>
<td>Tingting Yan, Associate Professor, Wayne State University, United States</td>
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</table>

We are investigating the impact of technological uncertainty and type of relationship in a buyer-supplier-supplier triad in an NPD context. To mimic competition, we developed an experiment with complete information. We find that participants discriminate with regard to the information they take into account in the contracts.

### 238  Saturday, 01:30 PM - 03:00 PM, Grand B  
**Session:** Behavioral Supply Management  
**Chair(s):** Thomas Kull

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<td>073-1420 Negotiation Outcomes - Testing the Impact of Personal Biases and Negotiation Medium</td>
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<tr>
<td>Thomas Kull, Associate Professor, Arizona State University Tempe, United States</td>
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<tr>
<td>Piyush Shah, Student, Arizona State University, United States</td>
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<tr>
<td>Feng Cheng, Student, Arizona State University, United States</td>
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</table>

We investigate the impact of personal bias that maybe culturally induced and the type of negotiation medium on the outcome of buyer supplier negotiations. We use an online simulation under the framework of theories from social psychology literature to test our concept.

### 238  Saturday, 01:30 PM - 03:00 PM, Grand B  
**Session:** Behavioral Supply Management  
**Chair(s):** Thomas Kull

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<tr>
<td>073-1559 The Shadow of the Network: Can Interactions Among Buyers Inspire Suppliers' Cooperation?</td>
</tr>
<tr>
<td>Yang Yang, Assistant Professor, University of Texas at El Paso, United States</td>
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<tr>
<td>Thomas Kull, Associate Professor, Arizona State University Tempe, United States</td>
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</table>

The “shadow of the future” refers to the effect of future interactions on cooperative behavior today. In this paper, we propose and conduct experiments to test the idea of the “shadow of the network”: the effect of actual and perceived interactions among buyers on a supplier’s cooperative behavior.

### 240  Saturday, 01:30 PM - 03:00 PM, Grand E  
**Session:** Paradigms for Parity in Advancing Women Leadership Supply Chain and Operations Management  
**Chair(s):** Aleda Roth

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<tr>
<td>073-2008 Paradigms for Parity in Advancing Women Leadership in Supply Chain and Operations Management</td>
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<tr>
<td>Aleda Roth, Professor, Clemson University, United States</td>
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</table>

Women are increasingly entering operations and supply chain management (SC/OM). Yet the pace of advancement of promising women into leadership roles is too slow. This session develops multiple paradigms describing the challenges and opportunities for the SC/OM field to bring gender equality into upper echelons by 2025.

### 241  Saturday, 01:30 PM - 03:00 PM, Grand F  
**Session:** Sourcing Contracts in Global Supply Chains  
**Chair(s):** Narendra Singh

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<th>Track: Global Supply Chain Management</th>
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<td>073-0208 Global Sourcing Through Capacity Reservation Contracts: The Impact of Exchange-Rate Uncertainty</td>
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<tr>
<td>Shahryar Gheibi, Assistant Professor, Siena College, United States</td>
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<td>Burak Kazaz, Professor, Syracuse University, United States</td>
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<td>Scott Webster, Professor, Arizona State University Tempe, United States</td>
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We study a firm’s global sourcing decisions under exchange-rate uncertainty. Our work indicates how currency fluctuations influence the firm’s capacity reservation decisions. We also explore the impact of risk aversion and financial hedging on the optimal sourcing policy.

### 073-0519 Knowledge Outsourcing for Multiple Buyers  
**Session:** Knowledge Outsourcing for Multiple Buyers  
**Chair(s):** Narendra Singh

<table>
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<tr>
<td>073-0519 Knowledge Outsourcing for Multiple Buyers</td>
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<tr>
<td>Jaeseok Lee, Student, Georgia Institute of Technology, United States</td>
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</table>
We introduce a game-theoretic model of knowledge outsourcing between a supplier and multiple buyers. We investigate how both the supplier and buyers benefit from the existence of multiple buyers. Also, we show how the heterogeneity of buyers impacts the supplier’s profit and discuss ways to improve profitability.

**073-0575 Investment Planning in Waste Management Supply Chain**

Avinash Geda, Student, University of Florida, United States
Vashkar Ghosh, Student, University of Florida, United States
Gulver Karamemis, Assistant Professor, University of Rhode Island, United States
Asoo Vakharia, Professor, University of Florida, United States

Should we undertake upstream (i.e., OEM) and/or downstream (waste management firm) investments in a supply chain to achieve better environmental outcomes? We compare the results for a centralized setting versus that of a decentralized one in terms of profitability with a view to developing a coordination mechanism.

**073-1031 Outsourcing under Competition: When to Choose a Competitor as a Supplier?**

Eda Kemahliloglu-Ziya, Assistant Professor, North Carolina State University, United States
Olga Perdikaki, Assistant Professor, University of South Carolina, United States

We study a supply chain with an OEM that could outsource either to an independent supplier or to an integrated firm that manufactures in-house and competes with the OEM. We identify how different contractual relationships between the OEM and the firm it sources from affects the OEM’s supplier choice.

**242 Saturday, 01:30 PM - 03:00 PM, Grand G**

**Session:** Doctoral Consortium 2

**Chair(s):** Eve Rosenzweig Diwas Kc

**073-2061 Doctoral Consortium 2**

Eve Rosenzweig, Associate Professor, Emory University, United States
Diwas Kc, Associate Professor, Emory University, United States

Only those doctoral students who have registered for this session are invited to attend. The purpose of the POMS Doctoral Consortium is to help doctoral students maximize their chances of having a successful academic career in our globally competitive environment.

**243 Saturday, 01:30 PM - 03:00 PM, Grand I**

**Session:** Retail Operations and Choice Modeling

**Chair(s):** Srikanth Jagabathula

**073-1354 Optimal Network Scale for On-Demand Retail Platforms**

Jiwen Ge, Student, Eindhoven University of Technology, Netherlands
Dorothey Honhon, Associate Professor, University of Texas Dallas, United States
Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands
Lei Zhao, Associate Professor, Tsinghua University, China

Nanostores are small retailers prevalent in the megacities of emerging markets. We consider an on-demand retail platform using nanostores as stocking locations. Deliveries are made either by the nanostore staff or via a crowd shipping network of freelancers. We study the optimal nanostore network scale under both order delivery approaches.

**073-0732 Assortment Optimization Under Cardinality Context-Effects in Online Retail**

Uzma Mushtaque, Student, Rensselaer Polytechnic Institute, United States
Jennifer Pazour, Assistant Professor, Rensselaer Polytechnic Institute, United States

Structure of the assortment optimization problem is analyzed when underlying consumer choice model incorporates information overload as a context-effect. Cardinality context-dependent versions of the Multinomial-Logit and Nested-Logit model are formulated. Revenue-ordered assortments are not optimal under these models. A greedy algorithm developed reduces complexity of finding a solution substantially.

**073-1572 The Limit of Rationality in Choice Modeling: Formulation, Computation, and Implications**

Srikanth Jagabathula, Assistant Professor, New York University, United States
Paat Rusmevichientong, Associate Professor, University of Southern California, United States

We quantify the limit of rationality (LoR) in choice modeling applications, where LoR is defined as the “cost” of approximating the observed choice fractions from a collection of offer sets with those from the best fitting probability distribution over rankings. We describe settings in which LoR can be computed efficiently.

**244 Saturday, 01:30 PM - 03:00 PM, Grand J**

**Session:** Practice-Based Research in Humanitarian Operations Management

**Chair(s):** Maria Besiou

**073-0337 Designing Refugee Camps for the Future - Layout And Embeddedness With Local Context**

Nezih Altay, Associate Professor, Depaul University, United States
Marianne Jahre, Professor, BI Norwegian Business School, Norway
Joakim Kembro, Assistant Professor, Lund University, Sweden

Increasing numbers of refugees and IDPs require expansions of existing and development of new camps. When designing a camp, personal integrity/safety, service functionality and the local context are some of many factors to consider. Comparing this with literature on warehouse layout principles, the paper discusses future camp design.

**073-0347 Change Management in Operations of Humanitarian Organizations**
Saturday, 01:30 PM - 03:00 PM

**073-0567** Conflicting Objectives in Humanitarian Operations: The Role of Earmarking

Maria Besiou, Professor, Kuehne Logistics University, Germany
H. Sebastian Heese, Professor, North Carolina State University, United States
Laura Turrini, Assistant Professor, European Business School, Germany

The misalignment of donors’ and humanitarian organizations (HOs’) objectives causes efficiency losses in program implementation. We analyze earmarking decisions as proxy for donor preferences in an effort to support HO decision making on funds allocation.

**073-1032** Inter-Agency Coordination Decisions and Modeling Considerations Under Commercial and Disaster Response Logistics

Miguel Jaller, Assistant Professor, University of California Davis, United States
Feizar Rueda, Assistant Professor, Universidad Nacional de Colombia, Universidad Distrital"Francisco José de Caldas", Colombia
Wilson Adarme, Professor, Universidad Nacional De Colombia, Colombia

This paper compares inter-agency coordination decisions and disaster response logistics. The comparisons are based on a literature review and bibliometric analyses. The authors discuss main approaches for quantitative logistics coordination modeling and propose a research agenda to improve the understanding of coordination under humanitarian logistics.

**073-1531** Do they keep their promises? Cross-sector trust and Commitment in humanitarian disasters

Ravi Srinivasan, Assistant Professor, Loyola University Maryland, United States
Arash Azadegan, Associate Professor, Rutgers University, United States

Collaborative efforts in humanitarian crises relies heavily on trust and belief in other organizations. Using data from response efforts to the Joplin, Missouri Tornado and Atlantic City, New Jersey Sandy Superstorm Sandy, we explore how NGOs, Government Agencies, voluntary consortia and companies view constituents from another’s sector.

**073-0582** The Implications of Eliminating Grading in Food Supply Chains

Karthik Murali, Assistant Professor, University of Alabama Tuscaloosa, United States
Isil Alev, Assistant Professor, Boston College, United States

Food grading based on aesthetics is among the biggest contributors to food waste in the U.S. Using a stylized model, we explore the social, economic, and environmental implications of eliminating grading in the agri-supply chain (retailer-farmer) by considering the introduction of differentiated produce at the retail level.

**073-0786** Coordinated Investment in Clean Energy Technologies under Critical Material R&D

Aditiya Vedantam, Assistant Professor, State University of New York at Buffalo, United States
Ananth Iyer, , Purdue University, United States

Global concerns about availability of rare earth elements used in clean energy technologies, like direct-drive wind turbines, has spurred various US DOE R&D projects. We develop a model with sequential industry capacity addition that provides an option value to these projects under progress in R&D milestones.

**073-1378** Investments In Renewable And Conventional Energy: The Role Of Operational Flexibility

Gurhan Kok, Professor, Koc University, Turkey
Kevin Shang, Associate Professor, Duke University Durham, United States
Safak Yucel, Assistant Professor, Georgetown University, United States

There is an ongoing debate among energy experts on how providing a subsidy for one energy source affects the investment in other sources. To explore this issue, we study capacity investments of a utility firm in inflexible (e.g., nuclear energy), renewable (e.g., wind), and flexible (e.g., natural gas) sources.
Increasing Retailer Preferences for New Products with Buyback Contracts

Atalay Atasu, Associate Professor, Georgia Institute of Technology, United States
Ximin (Natalie) Huang, Assistant Professor, University of Minnesota, United States

We study a global buyer's strategy of using supply chain transparency, i.e., revealing this firm's supplier list, to improve supplier compliance. We consider the interactions between a focal buyer and her suppliers under exogenous public scrutiny, and we also investigate the interactions between buyers via their common supply base.

Sustainable Education in Higher Education Institutions Brazilian Signatory of the UN Principles
Esdras Costa, Professor, Universidade de Sao Caetano do Sul - USCS, Brazil
Milton Farina, Professor, Universidade Municipal de Sao Caetano do Sul - USCS, Brazil
Raquel Pereira, Professor, Universidade Municipal de Sao Caetano do Sul - USCS, Brazil
Roberto da Silva, Professor, Universidade de Sao Caetano do Sul - USCS, Brazil
Davis Alves, Professor, Universidade de Sao Caetano do Sul - USCS, Brazil

Exploratory research was conducted in five institutions of Brazilian higher education and aimed to highlight the challenges faced in implementing the Principles for Responsible Management Education (UN) in view of the need to generate social and environmental responsibilities to future professionals about the principles "values" and "Method".

Determinants of Green Procurement Practices in Indian Firms
Manimay Ghosh, Professor, Xavier University, India

The research focuses on determining the key determinants that contribute to the adoption of green procurement practices in Indian firms. Additionally, it aims to examine the scale of adoption, and also investigate the relationship between each determinant and the adoption of green procurement practices.

Exploring the Environmental Regulations-Innovation-Performance Nexus Using MCDM View of Network DEA
Ramakrishnan Ramananthan, Professor, University of Bedfordshire, United Kingdom
Ruiqian Li, Student, Harbin University of Commerce, China

We extend the MCDM-view of DEA by borrowing from the Network-DEA literature to investigate the intermediary role played by innovation by treating it as an intermediary using MCDM-view of DEA. Results from our DEA analysis do not support the intermediary role of innovation in Chinese context.

To Recycle Or Not: An Analysis Of The Environmental And Financial Impact Of Recycling
Hailong Cui, Student, University of Southern California, United States
Greys Sosic, Associate Professor, University of Southern California, United States

We evaluate impact of recycling on GHG emissions through products' life cycle and derive conditions for reduction of long-run average emissions. We investigate underlying costs imposed on supply chain and on society to understand optimal decisions for decentralized (manufacturer, local government or independent party-driven recycling) and centralized (social planner) cases.

The Effect of Regulation on DfE Innovation
Gal Raz, Associate Professor, The University of Western Ontario, Canada
Cheryl Druhl, Associate Professor, George Mason University, United States
Vered Blass, Lecturer, Tel Aviv University, Israel

We examine the DfE innovations, use stage and refurbishing, of a firm selling new primary market products and refurbished products in a secondary market. The firm determines innovations, prices, and fraction collected. Using LCA data from cell phones, we compare EPR and Use stage regulations on profits and environmental impact.

Lemons, Trade-Ins, and Remanufacturing
Ximin (Natalie) Huang, Assistant Professor, University of Minnesota, United States
Atalay Atasu, Associate Professor, Georgia Institute of Technology, United States
Beril Toktay, Professor, Georgia Institute of Technology, United States

Trade-in programs have been shown to partially mitigate the lemons problem in secondary markets. We show when and how remanufacturing traded-in products can further improve the efficiency in secondary markets.

Increasing Retailer Preferences for New Products with Buyback Contracts
Yong-Pin Zhou, Professor, University of Washington, United States
Qinqin Zhang, Data Scientist, Microsoft Corporation, United States
Shi Chen, Assistant Professor, University of Washington, United States

We study a global buyer's strategy of using supply chain transparency, i.e., revealing this firm's supplier list, to improve supplier compliance. We consider the interactions between a focal buyer and her suppliers under exogenous public scrutiny, and we also investigate the interactions between buyers via their common supply base.
We study the ability of buyback contacts to increase retailer preferences for new products in a series of laboratory studies. New products are shrouded with demand uncertainty, decreasing the likelihood they gain market entry. Buyback contracts increase the frequency with which retailers stock new products by decreasing ambiguity aversion.

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### 073-0495 Decision Making under Service Level Contracts - An Experimental Analysis

Ulrich Thonemann, Professor, Universität zu Köln, Germany

Tobias Stangl, Student, University of Cologne, Germany

We consider service level contracts, commonly used in practice but receiving little attention in the behavioral operations literature. We provide analytical models and laboratory experiments to analyze ordering behavior under service level contracts and show that properly designed contracts can incentivize people to place close-to-optimal order quantities with low variability.

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### 073-1249 Managing Dishonest Retailers in a Supply Chain

Sundara Natarajan Panchanathan, Student, Indian Institute of Technology Madras, India

S Srivatsa Srinivas, Student, Indian Institute of Technology Madras, India

Rahul Marathe, Associate Professor, Indian Institute of Technology Madras, India

A revenue sharing contract between manufacturer and retailer is often accompanied by dishonesty from the retailer's side, revealed by common sources of information. The interaction depicting repeated retailer dishonesty and ensuing development of manufacturer's mistrust is modeled in a game-theoretic framework. Also, non-trivial contracts penalizing dishonest retailers are modeled.

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### 073-1669 Lot Sizing Decisions for Human Planners: Can We Adapt to Demand Variability?

José Antonio Larco, Assistant Professor, Universidad de Ingeniería y Tecnología, Peru

Amir Hossein Gharehgozli, Assistant Professor, Texas A&M - Galveston, United States

Jan Fransoo, Professor, Technische Universität Eindhoven, Netherlands

Grecia Delgado, Student, Universidad de Ingeniería y Tecnología, Peru

Cabrera José, Student, Universidad de Ingeniería y Tecnología, Peru

Planning decisions in a fluctuating demand environment are common in real production settings. We examine within a Master Production Schedule context which heuristics human planners may use to trade-off different costs and whether the planners are able to adapt to changing demand variability and production capacity slack.

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### 073-0583 Power and Fairness

Yan Wu, Associate Professor, University of Kansas, United States

Tony Haila Cui, Associate Professor, University of Minnesota, United States

Paola Mallucci, Assistant Professor, University of Wisconsin Madison, United States

We introduce a modified ultimatum game to study the role of bargaining power in distributive decision-making. The responder's fairness preference is elicited in response to shifts in power differentials. We find that responders in higher power conditions learn to ask for more through interactions with strategic proposers.

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### 073-1413 Negotiating Transshipments Prices for Improving Supply Chain Coordination

Sebastian Villa, Assistant Professor, Universidad de los Andes, Colombia

Elena Katok, Professor, University of Texas Dallas, United States

The exchange of product at the retailer level is called transshipment. Appropriate ordering decisions and transshipment prices improve supply chain coordination. Our experiments evaluate how subjects' decisions deviate from the theoretical channel-coordinating benchmarks. We evaluate retailers' decisions when they both negotiate transshipment prices and place orders, under different product profitability.

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### 073-1327 A Behavioral Perspective on Inventory Sharing

Enno Siemsen, Professor, University of Wisconsin Madison, United States

Hui Zhao, Associate Professor, Penn State University University Park, United States

Liang (Leon) Xu, Student, Penn State University University Park, United States

Taking advantage of aggregation effects in decentralized inventory systems requires effective transshipment of inventory. While previous research in this area has been mostly analytical in nature, we examine inventory sharing effectiveness from a behavioral perspective. We discuss four conditions that are necessary to create an effective decentralized inventory sharing system.

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### 073-0484 An Experimental Investigation Of Transshipment And Local Decision Making

Kay yu Chen, Professor, University of Texas Arlington, United States

Shan Li, Assistant Professor, Baruch College, United States

We experimentally examine how the possibility of inventory transshipment between two independent retailers affects each retailer's local decisions of inventory and study the formation of transfer prices under different price setting processes.

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### 073-1120 Corporate Social Responsibility (CSR) and Product Recalls

Sining Song, Student, Arizona State University Tempe, United States

Thomas Kull, Associate Professor, Arizona State University Tempe, United States

We study the ability of buyback contacts to increase retailer preferences for new products in a series of laboratory studies. New products are shrouded with demand uncertainty, decreasing the likelihood they gain market entry. Buyback contracts increase the frequency with which retailers stock new products by decreasing ambiguity aversion.
CSR programs may help firms prevent product recalls and increase consumer confidence and expectation of the product quality. This paper explores the complex effects of CSR programs on firm performance in product recalls. We find that CSR programs have different moderating effects on the association between CSR and product recalls.

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<td>Saurabh Ambulkar, Assistant Professor, Northeastern University, United States&lt;br&gt;Sridhar Ramaswami, Professor, Iowa State University, United States&lt;br&gt;Johnny Rungtusanatham, Professor, Ohio State University, United States&lt;br&gt;Jennifer Blackhurst, Professor, University of Iowa, United States</td>
<td>Food Life and the Supply Chain</td>
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<td>073-1717</td>
<td>Experience Breadth and Problem-Solving in Crowdsourcing Contests: An Empirical Investigation</td>
<td>Anant Mishra, Associate Professor, George Mason University, United States&lt;br&gt;Nirup Menon, Associate Professor, George Mason University, United States&lt;br&gt;Shun Ye, Assistant Professor, George Mason University, United States</td>
<td>Digital Innovation &amp; Digital Design</td>
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<td>Deepa Wani, Assistant Professor, University of Texas San Antonio, United States&lt;br&gt;Yan Dong, Associate Professor, University of South Carolina, United States&lt;br&gt;Kefeng Xu, Associate Professor, University of Texas San Antonio, United States&lt;br&gt;Manoj Malhotra, Professor, University of South Carolina, United States</td>
<td>POM in Food and Agriculture</td>
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<td>073-0350</td>
<td>Shelf Life and Service Level Agreements in Perishable-Product Supply Chains</td>
<td>Manoj Dora, Professor, Brunel University, United Kingdom&lt;br&gt;Sandra Transchel, Associate Professor, Kuehne Logistics University, Germany</td>
<td>POM in Food and Agriculture</td>
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<td>073-0350</td>
<td>Short and Long Shelf Life Food Supply Chain: Contrasting Challenges and Mitigation Strategies</td>
<td>Adarsh-Kumar Singh, Student, Nottingham University Business School China, China&lt;br&gt;Nachiappan Subramanian, Reader, University of Sussex, United Kingdom&lt;br&gt;Kul Pawar, Assistant Professor, University of Nottingham, United Kingdom</td>
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<td>073-0506</td>
<td>Role of Production Planning and Control in Reducing Food losses-a Multiple Case Analysis</td>
<td>Manoj Dora, Professor, Brunel University, United Kingdom</td>
<td>POM in Food and Agriculture</td>
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<td>073-0661</td>
<td>Technology Adoption Strategies for Digitization - Empirical Evidence from German Industrial Enterprises</td>
<td>Julian Müller, Student, University of Erlangen-Nuremberg, Germany&lt;br&gt;Kai-Ingo Voigt, Professor, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany</td>
<td>POM in Food and Agriculture</td>
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<td>073-0667</td>
<td>How Much to Open? Impacts of Openness on Software Development and Maintenance</td>
<td>Rakesh Mallippeddi, Student, Texas A&amp;M University College Station, United States&lt;br&gt;Emre Demirezen, Assistant Professor, Binghamton University, United States&lt;br&gt;Subodha Kumar, Professor, Texas A&amp;M University College Station, United States&lt;br&gt;Ram Gopal, Professor, University of Connecticut Storrs, United States</td>
<td>POM in Food and Agriculture</td>
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The Impact of Digitization of Manufacturing on the Theory of Performance Frontiers in Manufacturing Strategy

Sample 276 subjects.

tested based research e-payment are to that in inertia model late factors habits help e-payment based and Pure-play based services compare Click-and-mortar framework.

Kayvan Lavassani, Assistant Professor, North Carolina Central University, United States

Collaborative Value Creation and Sustainable Competitiveness across Business Ecosystem Platforms: A Business Process Perspective

We study an operational strategy enabled by 3D printing—Personal Fabrication (PF) strategy—in which, firm focuses on product's design and delegates its production to customer. We characterize the conditions under which, the PF strategy is beneficial to the firm, after considering various limitations of 3D printing technology and ecosystem.

073-1619

Collaborative Value Creation and Sustainable Competitiveness across Business Ecosystem Platforms: A Business Process Perspective
Kayvan Lavassani, Assistant Professor, North Carolina Central University, United States

Over the past few years, academics and practitioners have started to pay more attention to a new ecology of competition and new kinds of business models which are on the basis of business ecosystem platforms. This study investigates the changing role of management of business processes in global business ecosystems.

Vijay Mookerjee, Professor, University of Texas Dallas, United States

Leila Hosseini, Student, University of Texas Dallas, United States

A Bidding Policy for Spot Instances in Cloud Computing Market

This paper studies how the distribution contract between a firm (that provisions a core product and an add-on) and an online platform (that intermediates sales) interacts with the firm’s add-on strategy.

Chair(s): Zhe Zhang

Emerging Issues in Economics of Information Systems

Track: Information in Operations Management

073-0547

How Add-on Pricing Interacts with Distribution Contracts
Xianjun Geng, Associate Professor, University of Texas Dallas, United States
Yinliang Tan, Assistant Professor, Tulane University, United States
Lai Wei, Assistant Professor, Shanghai Jiaotong University, China

To Prepay or Default? The Impact of Local Financial Market Competition in Online Debt Crowdfunding

Mohammed Alyakoob, Student, Purdue University, United States
Mohammad Rehman, Associate Professor, Purdue University, United States
Zaiyan Wei, Assistant Professor, Purdue University, United States

We study the role of local financial market in a borrower's debt management. By combining transactions data from major crowdfunding platforms with data on local markets, we find that borrowers from more competitive markets are more likely to prepay, and less likely to default. We discuss managerial and policy implications.

073-0474

The Impact of Digitization of Manufacturing on the Theory of Performance Frontiers in Manufacturing Strategy
Zongjian Chen, Associate Professor, Huazhong University of Science & Technology, China

The rise of digitization will significantly alter innovation processes. Extreme customization of products and solutions, real-time feedback from the field, and VR/AR applications will create new roles for various stakeholders, will require new skill sets from innovators and new decisions to be executed, and rejigger sequences innovation processes.

Chair(s):
Operations & IS Perspectives

General/Emerging Topics in Operations Management

Track: Information in Operations Management

073-0547

How Add-on Pricing Interacts with Distribution Contracts
Xianjun Geng, Associate Professor, University of Texas Dallas, United States
Yinliang Tan, Assistant Professor, Tulane University, United States
Lai Wei, Assistant Professor, Shanghai Jiaotong University, China

This paper studies how the distribution contract between a firm (that provisions a core product and an add-on) and an online platform (that intermediates sales) interacts with the firm’s add-on strategy.
We introduce a contingency framework that relates digitization of manufacturing to the definitions of the performance frontier concept of a manufacturing unit, paying particular attention to the question of how to mix competitive priorities and competitive capabilities in manufacturing strategy. We discuss implications of the framework for disparate strategic tradeoffs.

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073-0104 Agricultural Supply Chains Under Government Interventions
Duygu Akkaya, Student, Stanford University, United States
Kostas Bimpikis, Assistant Professor, Stanford University, United States
Hau Lee, Professor, Stanford University, United States

Government support is often used in agriculture to ensure steady incomes for farmers and a reliable supply of agricultural commodities. We investigate the effectiveness of price support, cost support, and yield enhancement interventions along with different policy implementation methods in terms of their impact on farmers, consumers, and the government.

073-0029 Guaranteed Support Prices in Agriculture: Operational Decisions and Welfare Implications
Harish Guda, Student, University of Texas Dallas, United States
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States
Milind Dawande, Professor, UT Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States

A Guaranteed Support Price (GSP) for a crop is a guaranteed per-unit price, announced before the growing season, at which a governmental entity promises to procure the crop from farmers. We derive analytically-supported insights on the welfare implications of a GSP program and examine related questions.

073-0308 Price vs. Revenue Protection: An Analysis of Government Subsidies in the Agriculture Industry
Foad Iravani, Assistant Professor, University of Washington, United States
Saeed Alizamir, Assistant Professor, Yale University, United States
Hamed Mamani, Associate Professor, University of Washington, United States

To protect farmers’ income, the U.S. government offers the Price Loss Coverage and the Agricultural Risk Coverage subsidy programs. We develop models to analyze the effects of these programs on consumers, farmers, and the government. We provide insights about the effects of crop and market characteristics on the subsidy programs.

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073-0257 Design of Returns Policies With Risk Adjusted Profits
Haresh Gumani, Professor, Wake Forest University, United States

Quota-based and partial-refund returns policies abound between manufacturers and their resellers. We develop a game-theoretic model to explore their relative optimality. Using risk-adjusted profits, we show that manufacturer prefers the partial-refund policy whereas the reseller is better o? with the quota policy. This is consistent with anecdotal evidence.

073-1001 Try Before You Buy Pricing: Should Rental Fees Apply to Purchases?
Monire Jalili, Student, University of Oregon, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

When a product has uncertain value, a customer may rent that product before making a purchase decision. Given consumer utility uncertainty and diminishing utility, we analyze the optimal price and discounting policy when the firm can choose to apply some of the rental price paid toward conversion to purchase.

073-1639 Behavior of Long Tail Products
Samayita Guha, Student, Texas A&M University College Station, United States
Rakesh Mallipeddi, Student, Texas A&M University College Station, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States

Retailers have now started to pay attention to long tail products that individually have low demand but in aggregate can combine to create higher demand than few best-selling products. In this study, we propose an econometric model to examine the behavior of long-tail products using data from a large retailer.

073-0669 Optimal Allocation of Sales and Rental Inventory at a Retailer
Mehmet Altug, Assistant Professor, George Washington University, United States
Oben Ceryan, Assistant Professor, Drexel University, United States

We consider a retailer that needs to decide how much inventory to allocate for renting in every period while facing uncertain demand that splits between renters and buyers. We characterize the optimal policy and propose some implementable heuristics. We then extend our results to the duopoly case.

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073-0183 Optimal Procurement Auctions Under Multi-Stage Supplier Qualification
Wei Chen, Assistant Professor, University of Kansas, United States
Milind Dawande, Professor, UT Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States

We consider the problem of optimal procurement auctions under multi-stage supplier qualification. We extend our results to the duopoly case.
We consider a firm that solicits bids from a fixed-sized pool of yet-to-be-qualified suppliers for an indivisible contract. The contract must be awarded to a supplier who passes a costly multi-stage qualification process. The optimal procurement mechanisms are derived under various assumptions regarding the procurement and qualification process.

073-0759  Optimal Contract to Induce Continued Effort
Peng Sun, Professor, Duke University Durham, United States
Feng Tian, Student, University of Michigan - Ann Arbor, United States

We consider a basic model of a risk neutral principal incentivizing a risk neutral agent to exert effort in order to raise the arrival rate of a Poisson process. The effort is costly to the agent, unobservable to the principal, and affects the instantaneous arrival rate.

073-1089  Long-Term Procurement Contracts with Learning Effects
Ting Luo, Assistant Professor, California State University Fullerton, United States

We study how dynamic information asymmetry and stochastic learning shape the long-term contract design. The supplier can reduce production costs through stochastic learning, but the learning outcome is his private information. This complicates the buyer’s contracting problem substantially.

073-0825  Designing a Cost-Sharing Mechanism for Procurement Under Multi-Dimensional Private Information
Shivam Gupta, Assistant Professor, Texas State University, United States
Milind Dawande, Professor, UT Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States
Shouqiang Wang, Assistant Professor, Naveen Jindal School of Management, United States

We propose a simple cost-sharing mechanism for a principal procuring service to complete a project under information asymmetry on the agent’s cost and estimated completion time. We establish its optimality/near-optimality under several special cases, and provide valuable insights into the nature of cost-sharing for its use in practice.

259 Saturday, 01:30 PM - 03:00 PM, Juniper
Session: Best Paper Session: College of Healthcare Operations
Chair(s): Sarang Deo

073-2077  Discretionary Task Ordering: Queue Management in Radiological Services
Maria Ibanez, Student, Harvard University, United States
Jonathan Clark, .
Robert Huckman, Professor, Harvard University, United States
Bradley Staats, Associate Professor, University of North Carolina Chapel Hill, United States

A long line of research examines how best to schedule work to improve operational performance. This literature typically takes the perspective of a central planner who directs individuals to execute tasks in a prescribed order. In many settings, however, workers have discretion to deviate from the assigned order.

073-2080  Giving Away to Increase Profits? Price-Discrimination and the Effect of Free Goods
Jacob Chestnut, Student, University of Michigan Ann Arbor, United States
Ravi Anupindi, Professor, University of Michigan Ann Arbor, United States
Hyun-Soo Ahn, Professor, University of Michigan Ann Arbor, United States

Our work is motivated by a growing number of for-profit healthcare providers (Aravind Eye Hospital, LifeSpring, Narayana Hrudayalaya Heart Hospital, and others), who profitably serve the bottom of the pyramid for free. In view of this, our paper considers the pricing problem of a firm serving consumers with (private) heterogeneous...

073-2079  Data-Driven Management of Post-Transplant Medications: An APOMDP Approach
Alireza Boloori, Student, Arizona State University Tempe, United States
Soroush Saghaian, Assistant Professor, Harvard University, United States
Harini Chakkera, Professor, Mayo Clinic, United States
Curtiss Cook, Professor, Mayo Clinic, United States

Dynamic and robust decision-making for the management of multiple medications (i.e., tacrolimus and insulin as immunosuppressive and diabetes agents, respectively) among patients who undergo kidney transplantsations.

073-2078  The Effect of Online Reviews on Physician Demand: A Structural Model of Patient Choice
Yuqiu Xu, Student, New York University, United States
Mor Armony, Associate Professor, New York University, United States
Anindya Gose, Professor, New York University, United States

Social media platforms for healthcare services are changing how patients choose doctors. In this paper, we wish to derive the impact of online information on patient choice of outpatient care doctors. We are especially interested in how operational factors influence demand. To do so, we study unique data.

260 Saturday, 01:30 PM - 03:00 PM, Laurel
Session: New Models of Revenue Management
Chair(s): Metin Cakanyildirim

073-0746  Multi-Product Pricing with Stockouts and Satisfying Customers
Varun Gupta, Assistant Professor, Penn State University Erie, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States

Stockout for high inventory turnover products lead to loss of sales as customers may substitute their preferred product (stocked out) with another product (available). We study centralized pricing for a retailer and equilibrium prices for competing retailers selling to satisficing customers with stockout-based substitution under lost sales and backorders.

073-2002  A Dynamic Pricing Model With Capacity Sharing on a Network for Airline RM
We consider a Revenue Management setting for airlines where limited capacity from business compartment can be shared with economy compartment on each flight. We develop several heuristic dynamic pricing policies for this problem based on a deterministic model and network decomposition related ideas and evaluate their performance via simulation.

073-1614  Dynamic Pricing and Replenishment for Seasonal and Regular Products  
Oben Ceryan, Assistant Professor, Drexel University, United States
We study the interplay of optimal dynamic pricing and replenishment decisions for a firm offering two substitutable products that differ in how their inventories are managed, a seasonal product with a fixed initial quantity that allows dynamic price adjustments, and a regular product that can be periodically replenished.

073-0747  Optimizing Starvation to Avoid Cannibalization: Retailer's Strategies for Markets in Crisis  
Sandun Perera, Assistant Professor, University of Michigan-Flint, United States  
Syagnik Banerjee, Associate Professor, University of Michigan-Flint, United States  
Metin Cakanyildirim, Professor, University of Texas Dallas, United States
At times of crisis and disaster, donors often pay for necessary commodities distributed via local retailers. Retailers need to set prices that balance the trade-offs between vulnerable customer needs and their ability to pay. We study this pricing problem under different market conditions.

073-0535  The Benefits of Using Digital Manufacturing Tools in Small Enterprises  
Laryssa da Costa, Student, Centro Universitário FEI, Brazil  
Marcela Silva, Student, Centro Universitário FEI, Brazil  
Tarcíssio de Souza, Student, Centro Universitário FEI, Brazil  
Fábio Lima, Professor, Centro Universitário FEI, Brazil
The manufacturing systems are changing fast with the new concepts of digitalization as well as the technologies of so-called advanced manufacturing. This work presents the use of simulation as a digital tool providing a process improvement in a small enterprise through a partnership with the university.

073-1916  High Dimensional Feature Based Dynamic Pricing With Optimal Regret  
Tao Yao, Associate Professor, Penn State University University Park, United States  
xue wang, Student, Penn State University, United States  
Mike Wei, Assistant Professor, University of Buffalo, United States
We study a pricing problem where the products are described by a lot of features. We proposed a dynamic policy, called folded concave penalized maximum likelihood pricing (FCP-MLP). FCP-MLP leverages the sparsity of feature and can obtain the optimal regret $O(s(\log d + \log T))$.

073-1484  On Statistical Challenges of Online Decision-Making  
Hamsa Bastani, Student, Stanford University, United States  
Mohsen Bayati, Associate Professor, Stanford University, United States  
Khashayar Khosravi, Student, Stanford University, United States
Growing availability of data has enabled practitioners to tailor decisions at the individual-level. Recently, "contextual bandits" have been introduced as a framework to study these online decision making problems. In this talk we discuss statistical challenges that arise in such data-driven allocation of decisions.

073-0287  Application of Deep Learning for Newsvendor Problems  
Ashin Oroojlooy, Student, Lehigh University, United States  
Lawrence Snyder, Associate Professor, Lehigh University, United States  
Martin Takac, Assistant Professor, Lehigh University, United States
We study a newsvendor problem in which each demand observation has a set of features. We propose a deep learning based algorithm to optimize the order quantity. It integrates forecasting and inventory-optimization, rather than solving them separately. Numerical experiments suggest that our algorithm outperforms current approaches, especially for volatile demands.

073-0213  A Dynamic Mechanism for Achieving Sustainable Supply of High Quality Products  
Tracy Lewis, Professor, Duke University Durham, United States  
Fang Liu, Assistant Professor, Nanyang Technological University, Singapore  
Jing-Sheng Song, Professor, Duke University Durham, United States
Several leading companies have realized the importance of sustainable quality supply and have initiated programs to help their suppliers to sustain high quality production. This paper investigates what elements should be included in these guidelines to achieve the long-term sustainability goals.
Managing Supplier Social and Environmental Responsibility with Strategic Disclosure to Investors
Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States
Erica Plambeck, Professor, Stanford University, United States
Firms are beginning to measure their suppliers’ social and environmental impacts and report them to investors. Supply chain strategy and structure influence a firm’s costs and benefits from impact measurement, reduction and disclosure. We evaluate how a disclosure mandate affect impacts, firm expected profit, and its valuation by investors.

How to Get the Conflict Out of the Mineral Supply Chain
Han Zhang, Student, Indiana University Bloomington, United States
Goker Aydin, Professor, Johns Hopkins University, United States
H. Sebastian Heese, Professor, North Carolina State University, United States
A new legislation requires manufacturers to disclose their sources of “conflict minerals” - natural resources whose trade might finance conflicts. We study the effect of such interventions, using a model with mines, smelters, and manufacturers. We show that imposing penalties on manufacturers alone is not sufficient to eliminate conflict minerals.

Robust Product Line Design
Dimitris Bertsimas, Professor, Massachusetts Institute of Technology, United States
Velibor Misic, Assistant Professor, University of California Los Angeles, United States
Current approaches to product line decisions ignore uncertainty in customer choice behavior. We consider a robust optimization approach that addresses parameter and structural uncertainty in customer choice. Using a real conjoint data set, we demonstrate the fragility of traditional solutions and the value of robustness in product line decisions.

Dynamic Inventory and Pricing Management with Inventory Record Inaccuracy
Xiaoyi FENG, Student, City University of Hong Kong, China
Yangyang Xie, Student, City University of Hong Kong, China
Houmin Yan, Professor, City University of Hong Kong, China
We consider an inventory and pricing management problem with inaccurate inventory information. The discrepancy between the record and actual inventory accumulates, and they coincide when an inventory audit is performed. Under both periodic and probabilistic auditing patterns, we characterize the optimal state-dependent base-stock list-price policies and the corresponding structural properties.

Flexibility Configuration of Lead Times With Expediting Along the Order Delivery Process
Yong Zhang, Student, Xi’an Jiaotong University, China
Shenghao Zhang, Associate Professor, Xi’an Jiaotong University, China
The order delivery process usually consists of several stages with corresponding lead times. Facing surge in demand, managers often stipulate suppliers to deliver orders faster when lead time can be expedited. As full process flexibility in order expediting is expensive, this paper provides analytical results of where to locate flexible lead time.

Stability in Multi Professional and Multi Skilled Services
Hoda Bidkhori, Assistant Professor, University of Pittsburgh, United States
Reza Ahmadi, Professor, University of California Los Angeles, United States
Sriram Dasu, Associate Professor, University of Southern California, United States
Consider a system where we have different types of multi professional skilled workers. Each professional worker can be flexible to do different tasks which require different skills. Training multi skilled professional workers is costly. We first discuss the optimal flexibility and the learning in such system.
Saturday, 04:30 PM - 06:00 PM

267 073-0977  Patient Prioritization in Emergency Department Triage Systems: An Empirical Study
     Eric Park, Assistant Professor, University of Hongkong, Hong Kong
     Yichuan Ding, Assistant Professor, University of British Columbia, Canada
     Mahesh Nagarajan, Associate Professor, University of British Columbia, Canada
     Eric Grafstein, Head of Department of Emergency Medicine, Mount St. Joseph's Hospital, University of British Columbia, Canada

We analyze the ED decision makers' patient routing behavior in four EDs in metro Vancouver that use the Canadian Triage and Acuity Scale (CTAS) which has a waiting time-related target service level objective. We propose a general discrete choice framework that can analyze prioritization behaviors in multi-class queues.

073-0481  The Impact of Competitive Entry in an Organ Transplant Market
     Guihua Wang, Student, University of Michigan - Ann Arbor, United States
     Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States
     Wallace Hopp, Professor, University of Michigan Ann Arbor, United States

Using patient-level data from all transplant centers for liver transplant in US, we provide empirical evidence that new entrants affect incumbents' risk-taking behaviors. We then develop an econometric model to analyze the impact of competitive entry on patients' waiting time and survival.

073-0513  Distance, Quality, or Relationship? Interhospital Transfer of Heart Attack Patients
     Lauren Lu, Associate Professor, University of North Carolina Chapel Hill, United States
     Feng (Susan) Lu, Assistant Professor, Purdue University, United States

We empirically investigate the pattern of where heart attack patients are transferred between hospitals. Using 2011 Florida State Emergency Department and Inpatient Databases, we demonstrate the relative importance of three key factors in determining transfer destinations: distance, quality and relationship.

268 073-1602  Patient-Centered Capacity Planning for Primary Care Appointment Scheduling
     Ali Dogru, Student, University of Alabama Tuscaloosa, United States
     Sharif Melouk, Associate Professor, University of Alabama Tuscaloosa, United States

Motivated by patient-centered medical home principles, we develop a capacity planning model for appointment scheduling. Considering seasonal demand, patient preferences, no-shows, and lateness, we use stochastic optimization to determine the number of service providers and appointment slot durations to minimize waiting, idle, and overtime time. Experimentation provides managerial insights.

073-1840  Economies of Scale in Eyecare Delivery: Lessons from Selected Cases
     Venkataramanaiah Saddikuti, Associate Professor, Indian Institute of Management Lucknow, India
     Rahul Gope, Student, Indian Institute of Technology Bombay, India
     Yujata Pasricha, Student, Dr B R Ambedkar National Institute of Technology Jalandar, India

The article focuses on impact of scale of surgical units on the productivity of patient processes in order to address the growing demand-supply gap in healthcare delivery. Contributions are largely associated with unearthing and understanding how resources level and their interactions affect service centric value creation.

073-1328  Analysis of Overbooking and Pre-Charge Strategies for the Appointment System
     Guohua Wan, Professor, Shanghai Jiao Tong University, China

Customer no-shows are a long-recognized problem in the appointment system. We study two policies (refunding or not refunding the deposit), and construct models to compare the two policies. By performing numerical tests with a real data set, we show the insights, which match the theoretical models.

073-1689  Is Sooner Always Better? Capacity Management in Outpatient Care
     Mor Armony, Associate Professor, New York University, United States
     Nan Liu, Assistant Professor, Columbia University, United States
     Yunchao Xu, Student, New York University, United States

An important factor that determines whether a patient will show up or not for his scheduled appointment is how easy to reschedule if he chooses not to show up. In this talk, we discuss how an outpatient care provider should manage her practice by considering such patient strategic behavior.

269 073-0606  Optimal Ordering Policy for Dual-Sourcing Supply Chain: Channel Preference, Capital Constraint and Financing Strategy
     Nina Yan, Professor, Central University of Finance And Economics, China

We study a supplier with dual-sourcing channel, i.e., offline direct sale and online sale through e-commerce). Considering initial demand allocation, consumer’s channel preference and channel profitability, we analyzed the supplier’s optimal order quantity with ample capital. Furthermore, we discuss game equilibriums for the capital-constrained retailer and supplier with Bank Credit Financing and Ecommerce-Credit-Financing schemes.

073-0863  Impact of Tax Code on Supply Chain Firms
     Xinhua Xu, Student, Fudan University, China
     Gangshu Cai, Associate Professor, Santa Clara University, United States
This project studies the impact of a pair of different tax codes, sales tax and value-added tax, on the firms' performance in a variety of supply chain scenarios. Our analysis demonstrates that either tax code could outperform the other under conditions.

**073-0498**  
Equilibrium Decision of Credit Guarantee and Capital Constraint Supply Chain Under Different Ordering Patterns  
Jiang Lin, Associate Professor, Tianjin University, China  
Xiu Li, Associate Professor, University of North Carolina Charlotte, United States  
yang xiao, Student, Tianjin University, China

We study a retailer provide the manufacturer with the credit guarantee scheme under different order mode (MTO & MTS). The results show that the retailer will take different decision variables in MTO and MTS mode. When the manufacturer's initial capital level is less than a threshold, providing credit guarantees is a good choice for all.

**073-0716**  
Predicting Deal Closure Accurately - For Sales It Is a Matter of Survival  
Ming Si, Student, Case Western Reserve University, United States  
Amit Garg, CEO, ???, United States  
Rakesh Niraj, Professor, Case Western Reserve University, United States

Poor sales adoption of CRM systems is pervasive and significant ROI remains unrealized. Our Survival Analysis based models provide intelligence to increase CRM adoption, improve decision-making and planning at all levels of the Sales, Sales Operations, and Finance Operations within a media corporation.

**073-1233**  
Future of Drug Delivery -- Implantable Drug Delivery Device  
Mustafa Gurbuz, Associate Professor, Zaragoza Logistics Center, Spain

We discuss the impact of switching from the traditional drug delivery process (e.g., injections) to implanting microchips releasing the required dosage when necessary. We analyze the benefits (e.g., increased adherence) and risks (e.g., loss of control) for the different actors such as hospitals, chip producers, and patients.

**073-1580**  
Customized Assortment Planning  
Seyed Shahab mofidi, Student, Rensselaer Polytechnic Institute, United States  
Jennifer Pazour, Assistant Professor, Rensselaer Polytechnic Institute, United States

Typically in assortment optimization, the firm offers a collective assortment for all customers. Customized assortment for each individual can yield higher customer satisfaction. We developed a bilevel optimization that captures dependencies in customer choice behavior and the effect on the revenue improvement when multiple selections of finite inventory are made.

**073-1435**  
A Data-Driven Analysis of Equilibrium in the U.S. Airline Market  
Soheil Sibdari, Associate Professor, University of Massachusetts Dartmouth, United States

We use a data-driven approach to estimate equilibrium outcomes of the U.S. airline market in capacity levels. We compare the outcomes of those markets where an equilibrium is reached compared with other markets. We also provide reasons why equilibrium outcomes are not reached in some markets.

**073-1412**  
Analyzing Supply Chain Benefits of Point-of-Consumption Information  
Christine Herdmann, Student, Kuehne Logistics University, Germany  
Kai Hoberg, Associate Professor, Kuehne Logistics University, Germany

Smart devices and digital technologies enable streamlined ordering processes that leverage information at the point-of-consumption. We model different technology evolution stages with increasing degrees of automation and analyze their impact on the supply chain performance.

**073-0486**  
The Prognosis for Supply Chain Management in Health Care  
Carole Cagle, Assistant Professor, Mercer Univ Atlanta, United States  
Faye Sisk, Professor, Mercer Univ Atlanta, United States  
Arthur Rutledge, Professor, Mercer Univ Atlanta, United States

The nascent field of SCM in health care is gaining momentum. However, development is not without challenges. Many of the transparency, technological, and distribution issues are just beginning to be addressed. We propose a framework for assessing some of the unique challenges facing this industry and make recommendations.

**073-1888**  
Understanding Production Planning and the Gamesmanship Behavior of Producers: A Case of Korean Agriculture Industry  
Jaewoo Lee, Student, Korea University, Korea, Republic of (South Korea)  
Ho Jung Shin, Professor, Korea University, Korea, Republic of (South Korea)

Using the time series data collected from the Korean agriculture industry, we investigate autocorrelations among the price index and annual yields of produces and show that the gamesmanship behavior of Korean farmers in the supply chain may have caused severe and patterned mismatches between demand and supply.

**073-2070**  
Coordinating Supply Chains via Advance-Order Discounts, Minimum Order Quantities, and Delegations  
Prashant Chintapalli, Student, University of California Los Angeles, United States  
Stephen Disney, Professor, Cardiff University, United Kingdom  
Christopher Tang, Professor, ucla, United States

We study a retailer provide the manufacturer with the credit guarantee scheme under different order mode (MTO & MTS). The results show that the retailer will take different decision variables in MTO and MTS mode. When the manufacturer's initial capital level is less than a threshold, providing credit guarantees is a good choice for all.
We analyze the scenario in which a supplier offers a suitable discount in its wholesale price to encourage its buyer to place orders in advance. We show that advance-order discounts, when combined with (i) minimum order quantity contracts, or (ii) inventory management delegation contracts, can coordinate a supply chain.

**073-0250** The Use and Value of Social Network Information in Selective Selling  
Ruslan Momot, Student, INSEAD, France  
Elena Belavina, Assistant Professor, Booth School of Business, United States  
Karan Girotra, Professor, INSEAD, France

We study the use and value of social network information in selectively selling goods and services whose value derives from exclusive ownership among network connections. We find that information about customers' connectedness is more valuable than information about conspicuousness and that the two are substitutes.

**073-0685** Inaccurate Durations And Supply Chain Disruptions  
Mili Mehrotra, Assistant Professor, University of Minnesota, United States  
William Schmidt, Assistant Professor, Cornell University, United States

We examine the operational performance impact of inaccurate supply chain disruption duration estimates. Such inaccuracies can materially increase the cost of the disruption. This effect persists after controlling for the actual length of a disruption and can occur regardless of whether the disruption duration is initially over-estimated or under-estimated.

**073-1387** Impact of Order-Fulfillment Service Levels on Customer Value  
Nitish Jain, Assistant Professor, London Business School, United Kingdom  
Andres Musalem, Assistant Professor, Duke University Durham, United States  
Karan Girotra, Professor, INSEAD, France

Faster fulfillment of an order is one of the key service components for online retailers. Based on a detailed transactional data on fulfillment performance (actual and promised) and on subsequent purchase patterns, we impute the economic value of faster and timely fulfillment to online retailers.

**073-0175** Supply Chain Proximity and Product Quality  
Juan Camilo Serpa, Assistant Professor, MCGILL University, Canada

This paper explores the effect of supply chain proximity on product quality. To study this relationship, we merge four independent data sources from the automotive industry, collecting (i) auto component failure rates, (ii) upstream component factory locations, (iii) downstream assembly plant locations, and (iv) product-level links connecting the firms.

**073-1279** Towards Improving Factory Working Conditions in Developing Countries: An Empirical Analysis  
Xiaojin Liu, Student, University of Virginia, United States  
Anant Mishra, Associate Professor, George Mason University, United States  
Susan Goldstein, Associate Professor, University of Minnesota, United States  
Kingshuk Sinha, Professor, University of Minnesota, United States

How do factory working conditions in developing economies impact buyer sourcing strategy? We characterize supplier factory working conditions in terms of structural risk, fire risk, and electrical risk. We investigate the research question using archival data from safety inspection reports on supplier factories in Bangladesh.

**073-0554** On A Firm’s Optimal Response To Pressure For Gender Pay Equity  
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States  
David Anderson, Assistant Professor, City University of New York, United States

We present a theory of how a firm would respond to pressure for gender pay equity by strategically distributing raises and adjusting its organizational structure. Using mathematical reasoning, simulations, and data from a real employer, we demonstrate some of the unintended consequences of equal pay legislation.

**073-1950** Examining the Impact of Employees With Disabilities on Productivity  
Sriram Narayanan, Associate Professor, Michigan State University, United States  
Tharo Soun, Student, Michigan State University, United States  
James Ko, Student, Michigan State University, United States  
Kalyannoy Deb, Professor, Michigan State University, United States

In this study, we examine the role of team diversity on employee productivity using real-life time study data. In particular, we examine how diversity of different forms of disability in a garment manufacturing unit.

**073-0935** OHS Management System Maturity and Performance: The Role of Workers’ Representatives  
Paolo Trucco, Professor, Politecnico Di Milano, Italy  
Raffaella Cagliano, Professor, Politecnico Di Milano, Italy  
Rossella Onofrio, Student, Politecnico Di Milano, Italy  
Sarah Behnam, Student, Politecnico Di Milano, Italy

The role and contribution of workers’ representatives towards better OHS performance have been rarely discussed in literature, and the focus was on personal traits. The study discusses the relationship between OHS organizational maturity and the role of workers’ representatives. Results are based on a nation-wide survey carried out in Italy.
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| 073-1910 | The Management Practices by Control Systems Polarized by Legal Criteria of International Environmental Law | Washington Luiz Soares, Student, UNISANTOS UNIVERSIDADE CATÓLICA D SANTOS, Brazil  
Eliane Maria Martins, Professor, UNISANTOS, Brazil  
Getulio Akabane, Retired, CEETEPS, Brazil  
Hamilton Pozo, Retired, Centro Estadual de Educação Tecnológica Paula Souza, Brazil  
Jonathan Soares, Student, Estácio University, Brazil |

The Eco-efficiency management for sustainable transport depends on technical convergences between national and international policy choices where the common ground is the state of the art of global environmental governance. The article proposes the study of management practices by control systems polarized by legal criteria of International Environmental Law.

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| 073-1470 | Joint Location And Inventory Models for Deployments of Hybrid Electric Vehicle Charging Stations | Jie Zhang,  
Lihui Bai, Associate Professor, University of Louisville, United States  
Tongdan Jin,  |

We study a concept of hybrid electric vehicle charging station consisting of two types of services: battery swapping and level three DC fast charging. Joint queueing and optimization models are considered in determining the optimal locations with service level constraints for the charging network. Numerical results will be reported.

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<td>073-2035</td>
<td>The Art &amp; Science of Good Reviewing: A Panel Discussion</td>
<td>Carrie Queenan, Assistant Professor, University of South Carolina, United States</td>
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Despite the impact that reviews have on all of our careers, there is very little organized, field-wide discussion about expectations and best practices. In this panel, we will discuss trends the panelists see in reviews and guidelines for best practices in reviewing. Panelists: Nicole DeHoratius, Mark Ferguson, Chris Tang, and Asoo Vakharia.
### Saturday, 04:30 PM - 06:00 PM

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### 073-1769  Full Price or Full Quantity? A Behavioral Investigation of Buyback Contracts

Yinghao Zhang, Assistant Professor, University of Cincinnati, United States
Tianjun Feng, Associate Professor, Fudan University, China
Peiwen Yu, Assistant Professor, Fudan University, China
Stephanie Eckerd, Assistant Professor, University of Tennessee Knoxville, United States

We investigate two forms of buyback contracts: full quantity and full price contracts. Standard theory suggests that retailer should order the same amount of inventory under these two options. Lab experiments, however, reveal different ordering patterns. We propose a behavioral model to explain these experimental observations.

### 073-1815  The Behavioral Traps Of Making Multiple, Simultaneous, Newsvendor Decisions

Kay yut Chen, Professor, University of Texas Arlington, United States
Shan Li, Assistant Professor, Baruch College, United States

We conducted an experimental study to explore behaviors of newsvendors who make order decisions for two stores simultaneously. While the two stores are independent, we find that order decisions are impacted not only by the history from the same store, but also by the past information from the other store.

### 073-1947  Knowledge in the Disintegration and Integration of Outsourcing Manufacturing Processes in a Developing Cluster

Miguel Estrada, Professor, Ipade Business School, Mexico

This work models the transmission of knowledge under a collaboration scheme within a developing cluster, as a result of the disintegration and integration of processes to make the operation of a world-class supply chain feasible. This analysis shows the more automated robot integration or simpler human disintegration of operations dilemma.

### 073-1738  Service Systems With Unknown Quality and Customer Anecdotal Reasoning

Hang Ren, Student, University College London, United Kingdom
Tingliang Huang, Assistant Professor, Boston College, United States
Kenan Aniloglu, Assistant Professor, University College London, United Kingdom

We consider a service system where customers do not know the distribution of uncertain service quality and cannot estimate it fully rationally; instead, they form beliefs by taking sample averages of anecdotes. We characterize customers' joining behavior and the server's pricing, quality control, and quality information disclosure decisions.

### 281     Retail Operations and Channel Interactions

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### 073-0179  A Structural Estimation Model to Analyze the Evolution of Retail Channels in Emerging Markets

Christopher Mejia Arangueta, Assistant Professor, Eindhoven University of Technology, Netherlands
Jan Franse, Professor, Technische Universiteit Eindhoven, Netherlands
Nevin Mutlu, Assistant Professor, Technische Universiteit Eindhoven, Netherlands

We develop a structural estimation model to describe the retail channel choice of consumers in megacities. Channel behavior is primarily explained by income level, population density and retail footprint. Based on data from Latin America, we conclude that mom and/or pop stores retain their position as the largest retailing channel.

### 073-0914  Optimal Pricing Strategies for Dual-channel Retailers

Nevin Mutlu, Assistant Professor, Technische Universiteit Eindhoven, Netherlands

In this research, we develop an analytical model to study a dual-channel retailer's optimal pricing policy across store and online channels, considering that different channels exhibit different cost structures, and an inconsistent pricing scheme across channels may lead to consumer confusion, hence, lower sales.

### 073-0976  Comparing Supply Chain Coordinating Efficiencies of Flat-fee and Variable-fee Chargebacks

Chun-Miin (Jimmy) Chen, Assistant Professor, Bucknell University, United States

Suppliers fill retailers' orders to meet the fill-rate targets specified in the service level agreement to avoid non-compliance chargeback. We compare the efficiencies of the flat-fee and variable-fee chargebacks which coordinate the supply chains. The preliminary results show the choice of chargeback mechanism may lead to substantial expected penalty reduction.

### 073-1056  Impact of Supplier Encroachment when a Retailer Sells the Products of Competing Manufacturers

Parshuram Hotkar, Student, McCombs School of Business, United States
Stephen Gilbert, Professor, University of Texas Austin, United States

We consider a setting in which two manufacturers sell partially-substitutable products through a common retailer, and examine the impact of the development of direct-channel for one of the manufacturers. We find that the retailer's ability to purchase from another manufacturer can alter many of the exiting results on manufacturer encroachment.

### 282  Logistical and Operational Challenges in the Base-of-the-Pyramid

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### 073-0736  Conceptualizing Development Supply Chains for the Base-Of-The-Pyramid

ManMohan Sodhi, Professor, Cass Business School City University Lon, United Kingdom
James Knuckles, , ,
Supply chains for development purposes, as well as humanitarian supply chains, are distinct from commercial supply chains. However, conceptualizations of supply chains in the literature are centred on profit-maximizing entities in commercial supply chains. We attempt to conceptualise these supply chains using stakeholder resource-based view with examples from Haiti.

073-1377 Disposal Behavior at the Base of the Pyramid (BoP)
Giulia Tolotti, Manager, CMT Alromercato, Italy
Katharina Raab, Lecturer, University of Kassel, Germany
Ralf Wagner, Professor, University of Kassel, Germany

Increasing welfare of the poorest, who are seldom connected to the municipal solid waste management systems, increases waste production substantially. Grounding in a novel disclosure of determinants, habits, emotions and concerns of the impoverished disposal decisions we create a model of disposal processes and its impacts at the BoP.

073-0912 Challenges and Opportunities in Serving the Base-of-the-Pyramid
Nezih Altay, Associate Professor, Depaul University, United States
Rakib Pal, Professor, James Madison University, United States

We utilize Porter’s value chain framework to investigate the challenges and opportunities social enterprises face in base-of-pyramid supply chains. We identify value chain complexities for the social enterprise and introduce an affordability-accessibility challenge framework to illustrate these complexities in BoP supply chains.

073-0264 Private-Humanitarian Supply Chain Partnerships
Ioana Falagara Sigala, Student, Vienna Univ of Econ & Business Admin, Austria
Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria

This research develops a framework for private-humanitarian partnerships in humanitarian operations by integrating Transaction Cost and Resource-Based View theories. We follow a qualitative approach by interviewing experts both from private and humanitarian organizations to identify the current status and to determine the potential of future partnerships between those two sectors.

073-0666 Supply Chain Finance Case Study in Kenya
Tim Breitbach, Student, Center for Transportation and Logistics, United States

This research is a mixed methods case study on a renewable energy product supply chain in Kenya. Working with a social impact company, the case uses supply chain finance metrics and stakeholder interviews to measure the impact of resource allocation and financing decisions throughout the supply chain.

073-1247 Is Lower Always Better? Shedding Light on the Debate About Administrative Cost-Ratios for NPOs
Christian Burkart, Student, Vienna Univ of Econ & Business Admin, Austria
Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria
Fuminori Toyasaki, Associate Professor, York University, Canada

Assessing the performance of NPOs using administrative cost ratios can lead to undesired side effects called the ‘NPO starvation cycle’. We develop an analytical modelling framework (including organizational size and donor information) to analyze the influence of administrative costs on the decision-making behavior and utilities of NPOs and beneficiaries.

073-0840 Electronic Billing, Smart Meters, and the Salience of Energy Use
Christian Blanco, Student, University of California Los Angeles, United States
Magali Delmas, Professor, University of California Los Angeles, United States

Using over 750,000 electricity bills from over 20,000 households, we explore whether different payment methods may make electricity cost more or less salient. We also examine whether access to daily cost and consumption information provided by digital smart meters may make energy cost more or less salient.

073-1304 Self-Regulation in the Apparel Industry
André Calmon, Assistant Professor, INSEAD, France
Ewa Wankowicz, Student, Visiting Researcher at INSEAD, Italy
Luk Van Wassenhove, Professor, INSEAD, France

We present preliminary results of a survey that assesses why apparel manufacturers participate in the Sustainable Apparel Coalition (SAC), a self-regulating organization that seeks to mitigate the environmental and social impact of the fashion industry. Our goal is to identify drivers and barriers for adoption of the SAC’s standards.

073-2072 The Economics of Residential Solar PV Adoption
Ozge Islegen, Assistant Professor, Northwestern University Kellogg School of Management, United States
Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States
Given the new policies, federal and state incentives, we show how net metering rules, rate plans and options to finance solar projects affect the adoption of residential solar PV.

Organizations or government agencies typically disseminate warning messages to alert the public about potential disastrous events. In a repeated setting, they need to dynamically manage their credibility while incentivizing the public to take preventive actions. We characterize the optimal warning policy, which may turn out to be untruthful.

We investigate if precision plays a role in explaining the adoption or non-adoption of energy-efficiency practices. Our results with Field and Laboratory data show higher adoption rates for energy-efficiency recommendations with precise financial values. We contribute by providing insights on how precision can affect the uptake of operational practices.

We empirically investigate voluntary emissions reductions and the extent of efforts (i.e., the use of source reduction and end-of-pipe treatment) in relation to the relative assessed hazard levels of chemicals and examine how these relationships are moderated by operational leanness in a setting that assessed hazard levels change over time.

When managing consumer returns, retailers often adopt two active strategies, return time window adjustment and buyer assistant programs. We provide data driven guidance for retailers to allocate these return reduction efforts.

We consider a firm that can remanufacture products after the demand is realized. We analyze the effect of postponing remanufacturing operations on the pricing decisions of a firm. We show the application of our model using industry data.

We study the impact of consumer product returns and their potential refurbishing on the intertemporal product strategy of a firm facing strategic consumers. We show that returns may act as a commitment device for the firm facing a time inconsistency problem, and that firm profit could increase with return rate.

A closed-loop supply chain system is established considering the carbon-emission in life-cycle of the household appliances. Carbon-emission fluctuation in remanufacturing process is studied based on different recycling quality. Energy efficient and pricing decisions are researched between new and re-manufactured products under market demand and consumers preferences in a numerical example.

A closed-loop supply chain system is established considering the carbon-emission in life-cycle of the household appliances. Carbon-emission fluctuation in remanufacturing process is studied based on different recycling quality. Energy efficient and pricing decisions are researched between new and re-manufactured products under market demand and consumers preferences in a numerical example.
A critical dilemma facing clinicians is when and how often to screen patients who may suffer from a disease, especially those imposing a substantial cost burden. We develop predictive models to establish optimal screening conditions and validate them using data from a major hospital in the context of type-2 diabetes.

Innovation in healthcare technology has led to new healthcare delivery methods such as the addition of remote patient monitoring in the hospital intensive care unit. We utilize data on patient vitals to study the effect of remote monitoring on provider responsiveness to adverse patient health states in the ICU.

We use data from kidney transplantation to assess the relationship of number of patients treated with surgeon decision-making and patient outcomes. Preliminary results suggest that higher-volume hospitals are less likely to accept any given offer, discriminate less between donors of different health, and do so without worsening one-year patient outcomes.

Given a highly variable patient census at the service line level yet a fixed allocation of inpatient beds to service lines, a significant portion of admitted patients become "off-service" patients. We examine the tradeoffs and consequences of assigning incoming patients to an off-service bed as opposed to an on-service bed.

We study how operations managers learn from supply chain disruption in the presence of high stockout costs. In lab experiments, we find that subjects miss the opportunity to learn from near-miss events and evaluate their decisions after near-miss events as too positive, which lead to overly risky inventory decisions.

This paper studies the impact of risk perception consumer behavior on pricing strategies of the supplier and the retailer in a dyadic supply chain with emergency-dependent demand. How information sharing affects both sides' pricing strategies is also analyzed in this paper.

This paper employs multiple laboratory experiments to study the effects of quality and speed feedback on the production yields of independent data-input tasks. The results provide clarifying insights on yields, workers' experiences, stress, and behaviors given various forms of performance feedback or the lack thereof.

Through a laboratory experiment we analyze the consequences of implicit learning through tacit knowledge transfer on spillover learning when consecutive ramp-ups are performed. Our findings indicate that manufacturing firms should thoroughly manage the learning process during one production ramp-up, but should also take into account spillovers to future ramp-ups.

We develop a methodology for analyzing the relevance of the weather for retail operations planning. Using data from 673 stores with constantly changing product assortments we find a strong weather effect based on store location and sales theme. We review how this information can be used for operations planning.

Environmental Performance Drivers: Analysis of Efficient and Inefficient Manufacturing Plants in Advanced and Developing Economies

Teresa Betts, Assistant Professor, Murray State University, United States
Jan Super, Assistant Professor, Murray State University, United States
As organizations continue to expand global production, a debate continues surrounding both the extent of environmental practices used and their effectiveness. In this research, the Natural Resource Based View, the Practice Based View, and Institutional theory were utilized to develop and test a set of hypotheses surrounding these issues.

073-0920 Does Risk Management Impact Company's Inventory Turnover? Evidence from the Mining Industry
Michael Keilhacker, Student, Technische Universität München, Germany
Stefan Minner, Professor, Technische Universität München, Germany

Volatile commodity prices, demand uncertainties, tighter laws and inelastic output capacities lead to high risks for mining firms. We construct a simultaneous equations model, using public financial and nonfinancial data, to perform a longitudinal analysis to investigate how firms’ risk appetite, used risk technique, and inventory turnover is correlated.

073-1679 Impact of Operational Breaks on Productivity - Evidence From Agribusiness Setting
Pradeep Pendem, Student, Kenan Flagler Business School, United States
Paul Green, Student, Harvard University, United States
Bradley Staats, Associate Professor, University of North Carolina Chapel Hill, United States
Francesca Gino, Professor, Harvard University, United States

Using harvesting data from a U.S.-based agricultural firm, we evaluate effects of two types of breaks (expected versus unexpected), and two distinct forms of unexpected breaks, and find that unexpected breaks can, under certain conditions, yield immediate post-break performance increases. Our study has important implications on design of operational systems.

073-1727 Sustainable Competitiveness in Practices and Planning: An Overview of Brazilian Focal Companies
Danielle Pozzo, Student, Pontifical Catholic University of Rio Grande Do Sul, Brazil
Peter Hansen, Associate Professor, Pontificia Catholic University of Rio Grande Do Sul, Brazil
Davi Eskinazi, Student, Pontificial Catholic University of Rio Grande Do Sul, Brazil
Naiara Santana, Student, Pontificial Catholic University of Rio Grande Do Sul, Brazil

This study provides an overview of Brazilian focal companies regarding sustainable competitiveness. A survey was conducted with companies from different industries focusing on the adoption of sustainable practices and sustainable principles on strategic planning. Main results show that sustainable competitiveness level of adoption is affected by industry specificities and company size.

073-1853 The Effect of Additive Manufacturing on Supply Chain Sustainability
Mihalis Giannakis, Associate Professor, Audencia Business School, France

This paper studies how additive manufacturing impacts on supply chain sustainability. Through a combination of case studies and a large survey it explores the mediating and moderating effect of the level of product customization on the environmental, social, and economic dimensions of sustainable performance.

073-0240 Subsidizing Contracts for 3D Printing/Manufacturing Products
Mohammad Arbabian, Student, University of Washington, United States
Michael R. Wagner, Professor, University of Washington, United States

Recently, 3D printing has found its way into manufacturing. In this study, we focus on a subsidizing contract where a manufacturer subsidizes the retailer’s cost of a 3D printer. We derive the equilibrium of the resulting game.

073-0390 Best Practices From Lean Startup Innovation Processes to Traditional Manufacturing Industries Innovations
Jukka Hemilä, Senior Scientist, VTT Technical Research Centre of Finland, Finland

Traditionally manufacturing industries are over designing and engineering products before the commercialization. This study indicates four stages for accelerating idea to market time in manufacturing industries, by combining best practices from the lean startup methodology and software industries case study experiences.

073-2054 Entering Convergent Product Market: Cooperation Synergy and Market Expansibility
Dawoon Jung, Assistant Professor, Korea University, Korea, Republic of (South Korea)
Byung Cho Kim, Associate Professor, Korea University, Korea, Republic of (South Korea)
Bosung Kim, Assistant Professor, K A I S T, Korea, Republic of (South Korea)

Technological convergence is an attempt to integrate disparate technologies across the conventional boundaries and its outcome is convergent product which often exhibits irreplaceable synergetic advantages. This paper examines a firm’s strategic choice that confronts the technological convergence with the view of targeting the growing demand and the synergy from convergence.

073-0048 R&D Project Management in an Economic Downturn: Tools, Methods, Strategies and Outcomes
John Ettlie, Professor, Rochester Institute of Technology, United States

In a sample of 76 U.S. automotive R&D projects, after the Great Recession of 2008-10, findings demonstrate that advanced project management of these R&D investments was significantly associated with successful project outcomes, and more successful if suppliers were rated as relatively easy to coordinate but with a complex customer relationship.

073-1093 Project Management Complexity Related to the Performance of Stakeholders in IT Projects: A Case Study
Orlando Cattini Junior, Associate Professor, Fundacao Getulio Vargas, Brazil

In a case study of 76 U.S. automotive R&D projects, after the Great Recession of 2008-10, findings demonstrate that advanced project management of these R&D investments was significantly associated with successful project outcomes, and more successful if suppliers were rated as relatively easy to coordinate but with a complex customer relationship.
### 073-1898 The R&D Action Selecting Method Based on the Focus Points
Yonggang Li, Assistant Professor, Dalian University of Technology, China

We provide a new action selecting model for the R&D project which is irreversibility. In the model each action is valued by a particular state instead of the combination of all possible states. The focus point is obtained by solving a bi-objective optimization problem for the outcome and probability.

### 073-1579 Engineering System Framework for Innovation
Zoran Perunovic, Associate Professor, Technical University of Denmark, Denmark

The presentations shows conceptual development of an Engineering System framework for innovation of complex systems. Subsequently, its application is shown on examples of offshore oil and gas, maritime, and healthcare industries.

### 073-1766 Understanding the Impact of Individual’s Rating Patterns on Predictive Accuracy of Recommender Systems
Xiaoye Chen, Student, Indiana University, United States
Jingjing Zhang, Assistant Professor, Indiana University, United States
Lucy Yan, Assistant Professor, Indiana University, United States

This paper investigates how the rating patterns, i.e., rating value, rating structure and network embeddedness, of individual users and items affect the performance of recommendation algorithms. Our experiments use five real-world datasets and the experimental results show consistent and significant effects of several rating measures on recommendation accuracy.

### 073-1850 Platform and Third-Party Endorsements in Room Sharing Economy
Karen Xie, Assistant Professor, University of Denver, United States
Wei Chen, Assistant Professor, University of Arizona, United States

This paper studies how the availability of platform and third-party endorsements change participants’ behaviors on room sharing platforms. The results provide insights for sharing economy platforms to better incentivize participants as well as design endorsement mechanisms.

### 073-1834 Users’ Resilience to Kickstarter Scam
Xue Tan, Student, University of Washington, United States
Yingda Lu, Assistant Professor, Rensselaer Polytechnic Institute, United States
Yong Tan, Professor, University of Washington, United States

This paper explores how failures affect users’ backing behavior in Kickstarter. Users’ expectation of the quality of crowdfunding projects is an important determinant of their choice for backing. Users who have experienced scams or unsuccessful projects may reassess their belief in the quality of projects.

### 073-1983 Time Based NLP Model for Improving Port Logistics in a Steel Industry: A Case Study
vipulsh shardeo, Student, Indian institute of Technology Delhi IIT, India
Jitender Madaan, Assistant Professor, Indian institute of Technology Delhi IIT, India

The objective of this paper is to highlight issues faced during the loading/unloading of the materials at the port. To obtain the optimal solution of the resource allocation problem, mathematical model is proposed. The aim of this paper is to maximizing port efficiency, optimum crane allocation, minimizing throughput.

### 073-0177 On-line Scheduling of Order Picking and Delivery Problem With Multiple Zones Limited Vehicle Capacity (OPDPMC)
Jun Zhang, Student, Dalian University of Technology, China
Xuping Wang, Professor, Dalian University of Technology, China
Kai Huang, Associate Professor, ??????, Canada
Zhang Nana, Student, Dalian University of Technology, China

It’s significant to coordinate order picking and delivery decisions at all levels of B2C supply chain. On-line OPDPMC is studied to minimize the sum of makespan and delivery cost. An 4-competitive algorithm by integrating the existing methods of integrated production-delivery and batching machine problem is presented.

### 073-1899 Demand Driven MRP Buffer Sizing: an Optimisation Approach on a Case Study
Romain Miclo, Consultant / Researcher, Agilea, France
Franck Fontanilli, Associate Professor, Mines Albi, France
Matthieu Lauras, Associate Professor, Mines Albi, France
Jacques Lamothe, Professor, Mines Albi, France
Philippe Bornert, Agilea CEO, Agilea, France

The paper presents a new optimisation approach for Demand Driven MRP Buffer Sizing. It is developed as a work in progress on a case study in the production planning and control (PPC) area of an industrial company. The model is tested on a steel plant case study and shows promising results.
One critical issue in Demand Driven MRP implementation concerns strategic buffer sizing. An optimisation research work has been investigated in order to find appropriate parameters to size buffers. Firstly, a metaheuristic approach has been realised with a simulated annealing algorithm. Then a business algorithm has been defined and developed.

**073-0453** Implementing Lean Techniques Within Micro-Enterprises: A Case of Cedar Labels
Lauren Minshull, Student, University of Huddersfield, United Kingdom
Benjamin Dehe, Senior Lecturer, University of Huddersfield, United Kingdom

This research delves into the implementation of quality techniques (5S, SMED, JIT and TPM) within a micro-manufacturing in the UK. Using an action research methodology, we assessed the different techniques’ effect on variation, cycle times and waste. This study contributes directly to the lack of quality management research in micro-organizations.

**073-0092** Small Manufacturing Enterprise Using a Theory of Constraints as an Operation Strategy
Hamilton Pozo, Retired, Centro Estadual de Educação Tecnológica Paula Souza, Brazil
Belmiro João, Professor, Pontifícia Universidade Católica de São Paulo, Brazil
Takeshy Tachizawa, Associate Professor, Faccamp - Faculdade Campo Limpo Paulista, Brazil

The aim of this paper is to identify how a small enterprise use the theory of constraints as an operation strategy to increase the the performance. The method is a case study in a small manufacturing enterprise in Brazil. The results obtained shows better performance in their operation.

**073-1980** On the Financial Value of Continuous Improvement
Matthew Kaufman, Assistant Professor, Portland State University, United States
Ella Mae Matsumura, Professor, University of Wisconsin Madison, United States
Urban Wemmerlov, Professor, University of Wisconsin Madison, United States

The continuous improvement literature is sparse regarding evidence of financial value. Managers hold beliefs that CI inevitably leads to financial benefits, making pre- and post- implementations unnecessary. We discuss the literature, lack of templates for economic justifications, soft and hard capacity changes, and the role of management control systems.

**295** Saturday, 04:30 PM - 06:00 PM, Maple
*Session: OM-Marketing Interface*

Chair(s): Shu Hu

**073-1046** Leveraging Skill and Engagement to Maximize Player Retention in Online Video Games
Yan Huang, Assistant Professor, University of Michigan, United States
Stefanus Jasim, Assistant Professor, University of Michigan Ann Arbor, United States
Puneet Manchanda, Professor, University of Michigan, United States

We propose a novel two-stage data analytic modeling approach, combining statistical methodologies with optimization techniques to model customer engagement as a function of game play motivation and then maximize customer retention via matching in the large and growing video game industry.

**073-1547** Time to Product Recall Decisions: Marketing & Operational Perspectives
Chelsey Hill, Student, Drexel University, United States
Chaojiang Wu, Assistant Professor, Drexel University, United States

This paper investigates time to recall decision in the automotive industry. We conduct an empirical analysis to estimate the impact of timing on sales and repair. Then, we quantify the cost by developing a theoretical model and perform numerical analysis.

**073-1443** A Strategic Analysis of Committing Quantities in Dual-Channel Supply Chains
Zhaofang Qin, Associate Professor, 1979, United States

This paper studies the benefits of money-back guarantees (MBGs) on the seller under the presence of strategic consumers. The result explains why MBGs is ubiquitous in the retailing world. The effects of the parameters in the model on the profit benefit are shown in the numerical analysis.

**073-1805** Consumers' Purchase Behavior Under Trade-In Program with Limited Collection Period
Shu Hu, Student, Southwest Jiatong University, China
Zujun Ma, Professor, Southwest Jiatong University, China
Rick So, Professor, University of California Irvine, United States

We analyze the influence on consumers' purchase behavior under trade-in program with limited collection period. We find firm can promote trade-in through increasing collection period, products upgrade degree, subsidy for trade-in, or shortening products' life cycle. However, when consumers are strategic, firm doesn't need to improve products upgrade degree unceasingly.

**296** Saturday, 04:30 PM - 06:00 PM, Cottonwood
*Session: Sharing and On-demand Economy*

Chair(s): Upender Subramanian

**073-0228** Effects of Consumer-to-Consumer Product Sharing on Distribution Channel
Baojun Jiang, Assistant Professor, Washington University St Louis, United States
Lin Tian, Assistant Professor, Shanghai Univ. of Finance and Economics, China

This paper studies how consumer-to-consumer product sharing affects the distribution channel, where the upstream manufacturer has to build its production capacity beforehand. We show that consumer-to-consumer sharing tends to increase the retailer’s power in the channel and that it is more likely to benefit the retailer than the manufacturer.

**073-0635** Dynamic Stimulus in Crowdfunding
Longyuan Du, Student, University of Toronto, Canada
Ming Hu, Associate Professor, University of Toronto, Canada
Jiahua Wu, Assistant Professor, Imperial College London, United Kingdom
In this paper, we study the dynamic stimulus strategies in crowdfunding. We first characterize the dynamics of a project's pledging process. Then we propose three dynamic strategies, namely seeding, feature upgrade and limited time offer, and characterize the optimal policies for implementing these strategies, and quantify potential benefits.

### 073-0833 Labor Platforms for On-Demand Services
Saif Benjaafar, Professor, University of Minnesota, United States
Jianya Ding, Student, University of Minnesota, United States
Guangwen Kong, Assistant Professor, University of Minnesota, United States
Terry Taylor, Professor, University of California Berkeley, United States

We study consumer and labor welfare on-demand service platforms that rely on self-scheduled workers. The platform decides on wages and prices knowing that customers are price- and delay-sensitive and agents have reservation wage rates that depend on their availability.

### 073-0721 Strategic Surge Pricing and Communication on On-Demand Service Platforms
Harish Guda, Student, University of Texas Dallas, United States
Upender Subramanian, Associate Professor, University of Texas Dallas, United States

We examine pricing and communication strategies of on-demand service platforms, explicitly accounting for the platform’s and workers’ incentives to serve consumers in adjacent network zones. We show when, how and why surge pricing may be counter-intuitively used even in zones where supply exceeds demand to further imbalance supply and demand.

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<td><strong>Optimal Practice of Bundling in a Duopoly</strong></td>
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<td>Araz Khodabakhshian, Student, University of California Los Angeles, United States</td>
<td>Guillaume Roels, Associate Professor, University of California Los Angeles, United States</td>
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<td>Michael Norton, Associate Professor, University of California Los Angeles, United States</td>
<td>Uday Karmarkar, Professor, University of California Los Angeles, United States</td>
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<td>Eric Wodrich, Student, Ivey Business School, Canada</td>
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Bundling is a common practice in several businesses. However, there are firms that choose not to bundle or unbundle their existing bundles. We study the effect of competition on firm’s bundling strategy in a duopoly and show that in equilibrium one firm bundles and the other one does not.

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<th>Session: Advances in Network Revenue Management</th>
<th>Track: Revenue Management and Pricing</th>
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<td><strong>Chair(s):</strong> Rui Zhang</td>
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<td><strong>Saturday, 04:30 PM - 06:00 PM, Laurel</strong></td>
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<td><strong>An Approximate Dynamic Programming Approach to Dynamic Pricing for Network Revenue Management</strong></td>
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<td>Jiannan Ke, Student, Shanghai Jiao Tong University, China</td>
<td>Dan Zhang, Associate Professor, University of Colorado Boulder, United States</td>
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<tr>
<td>Huan Zheng, Associate Professor, Shanghai Jiao Tong University, China</td>
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We propose an approximate dynamic programming approach to the dynamic pricing problem for network revenue management. We show that the approximate linear program under affine approximation and linear demand can be reformulated as a compact QCQP and efficiently solved. Numerical experiments confirm that the ensuing pricing policies perform well.

| **073-0790 Dynamic Pricing for Hotel Rooms When Customers Request Multiple-Day Stays** | **073-1403 Large Scale Dynamic Network Revenue Management with Application in Pricing of Interactive Cloud Applications** |
| Selvaprabu Nadarajah, Assistant Professor, University of Illinois at Chicago, United States | Hossein Jahandideh, Student, University of California Los Angeles, United States |
| Yun Fong Lim, Associate Professor, Singapore Management University, Singapore | 

We model a hotel choosing optimal booking price for rooms (resources) on each individual day, while considering room availability throughout the multiple-day customer stays (products). Our model differs from those pricing products directly. We highlight the importance of incorporating multiple-day stays, provide pricing insights, and develop dynamic pricing policies.
We consider a cloud provider making personalized dynamic pricing decisions for hosting interactive applications. We decompose the resulting stochastic dynamic program into single-resource problems by exploiting structural properties of the optimal Lagrangian variables. We define a pricing mechanism based on the solution to the decomposed problem and demonstrate its effectiveness.

073-1423 An Origin-Destination Decomposition Method for Network Revenue Management
Rui Zhang, Assistant Professor, University of Colorado Boulder, United States
Dan Zhang, Associate Professor, University of Colorado Boulder, United States
In this paper, in contrast to resource-based decomposition method, we consider a decomposition method where the approximate linear programming of the network revenue management problem is decomposed into a collection of subproblems, each corresponding to an origin-destination pair, which we call the OD-based decomposition.

073-0312 Examining Supply Chain Inventory Volatility: Evidence From US Automobile Industry
Chung-Yean Chiang, Assistant Professor, Georgia Southern University, United States
Zhuang Qian, Student, Suny At Buffalo, United States
Chia-Hung Chuang, Assistant Professor, University of North Dakota, United States
This study aims to examine the causes of supply chain inventory volatility for a finished good product. Using secondary data and regression, we empirically test factors influential to the supply chain inventory instability at product level and internal to the production-sales association.

073-1938 A Critical Review of the Focused Factory Concept and its Application
SILVIA PONCE, Associate Professor, HEC Montreal, Canada
To focus or not to focus the factory? The Shakespearian dilemma emerging from the extant OM literature is explored by means of a systematic content analysis of Skinner’s, key authors’ contributions and four case studies. Different levels of focus could explain contradictory interpretations (e.g. focus-flexibility, focus-agility).

073-0855 Increasing Manufacturing Flexibility Through Battery Management of Automated Guided Vehicles
Qazi Kabir, Assistant Professor, State University of New York at Oneonta, United States
Yoshinori Suzuki, Professor, Iowa State University, United States
This paper investigates how the duration of battery charging for automated guided vehicles (AGVs) can be varied to enhance the flexibility of a manufacturing system. Simulation models were developed to investigate this approach. Results show that productivity of an AGV system can be increased significantly by this approach.

073-0473 Impact of Sustainability Initiatives on Short-term and Long-term Firm Performance
Zhasmina Tacheva, Student, Suny At Buffalo, United States
Charles Wang, Associate Professor, Suny At Buffalo, United States
This study examines the impact of sustainability initiatives on short-term and long-term firm performance. We also investigate how sustainability initiatives in various supply chain processes including sourcing, production, distribution, and demand management contributes to company performance.

073-0828 Complete Operations Management Course in CANVAS
Bo van der Rhee, Professor, Nyenrode University, Netherlands
Glen Schmidt, Professor, University of Utah, United States
In this workshop we share our Operations Management course in CANVAS that can be offered online, in-class, or mixed. We created the following original materials from scratch: 1) a PDF textbook, educational videos (50+), and homework & exam questions. We also fully integrate Littelfield, an online simulation, and case discussions.

073-0446 Workshop on Curriculum and Pedagogy for the OM 'Core' Course
Joel Goldhar, Professor, Illinois Institute of Technology, United States
Arthur Hill, Professor, University of Minnesota, United States
NO FIXED PROGRAM. Bring your best ideas, innovations and questions about curriculum and teaching in the required OM core course at both UG and MBA levels. Anyone may make a formal presentation of up to 2 minutes. Both new and experienced Faculty are invited to participate.

073-0569 Understanding the Operations Management Student
Stephanie Powers, Professor, Red Deer College, Canada
What teaching and learning methods most engage students? What do students feel is effective for learning? Does perception match performance? A statistical analysis of OM student surveys and correlation to their performance. Methods include reading textbooks, homework problems, lectures, popular videos, news articles, class activities, case studies, and instructional videos.

073-1896 Teaching Revenue Management
Mark Ferguson, Professor, University of South Carolina, United States
Richard Metters, Professor, Texas A&M University College Station, United States
Specific tools to use and games to play in teaching revenue management will be discussed. Audience members are encouraged to bring and share their own methods.

073-0734 Analysis of Tailored Base-Surge Policies at Walmart.com
Linwei Xin, Assistant Professor, University of Illinois Urbana-Champaign, United States
Jagtej Bewli, Manager, WalmartLabs, United States
John Bowman, Principal Data Scientist, Walmart, United States
Long He, Assistant Professor, National University of Singapore, Singapore
Zhiwei Qin, Algorithm Researcher, Didi Research America, United States

We consider the following dual-sourcing inventory problem: one supplier is reliable but has a longer leadtime; the other one is not always reliable but has a shorter leadtime. Moreover, the leadtime difference is 12-period. We propose a Tailored-Base Surge policy and show it outperforms other heuristics using data from Walmart.com.

073-0893 Joint Repair Sourcing and Stocking Policies for Repairables using Erlang-A and Erlang-B Queueing Models
Shimon Bitton, Student, Technion Israel Institute of Technology, Israel
Izack Cohen, Lecturer, Technion Israel Institute of Technology, Israel
Morris Cohen, Professor, University of Pennsylvania, United States

We develop strategic stocking and sourcing policies for two categories of repairable parts; upon failure of a first category part its system becomes non-operational, but when a second category part fails the system can still operate for a predetermined period of time before it becomes non-operational.

073-2065 Inventory Placement Under Storage Capacity Constrains and a Dynamic Fulfilment Policy
Salal Humair, Principal Research Scientist, Amazon.com, United States
Onur Ozkok, , ,
Yan Xia, , ,
Arjun Subramaniam, , ,
Erdem Eskigun, , ,
sTEVE Bartz, , ,

We investigate how to distribute inventory for multiple products among multiple capacity-constrained warehouses serving multiple regions, when demand is fulfilled by a shipping-cost-minimizing policy at real-time. We develop a fast algorithm to distribute the inventory. We present results showing how consideration of the fulfillment policy changes product distribution across warehouses.

073-1332 Joint Inventory, Pricing and Return Management: Theory and Practice
Alvaro Maggiar, Research Scientist, Amazon.com, United States
Ali Sadighian, Research Science Manager, Amazon.com, United States

We investigate a multi-period stochastic inventory problem wherein a retailer can decide in each period to purchase, markdown, return and/or liquidate inventory. We offer a theoretical analysis of the problem as well as practical implementation details, considering extensions that include demand correlation, lead-time, perishability, supply risk and capacity constraints.
Drivers of Productivity in Radiology
Maria Ibanez, Student, Harvard University, United States
Using detailed data on millions of radiological studies interpreted by physicians, we study the drivers of speed and quality of the interpretation, and identify implications for scheduling and allocation of work across workers.

The Effects of Health IT (HIT) and Communication Quality on Medical Malpractice Lawsuits
Luv Sharma, Assistant Professor, Univ of South Carolina, United States
Carrie Queenan, Assistant Professor, University of South Carolina, United States
This paper uses data from 168 acute care hospitals in Florida to study the impact of HIT and caregiver-patient communication quality on the number of medical malpractice lawsuits filed against the hospital. Results demonstrate a direct impact of communication quality and an indirect impact of HIT in influencing lawsuits.

The Impact of the Hospitalist on Hospital Quality, Efficiency and Cost Metrics
WC Benton, Professor, Ohio State University, United States
Hospital medicine has grown to a specialty to a flourishing field of more than 48,000 hospitalist, practicing in more than 80% of American hospitals. Fueled by the ACA and better physician alignment the hospital is the fastest medical specialty. How does hospitalist affect hospital management on cost and quality decisions?

Coping With Variability in Healthcare: The Processing Time Buffer
Oskar Roemeling, Assistant Professor, Rijksuniversiteit Groningen, Netherlands
Martin Land, Associate Professor, University of Groningen, Netherlands
Kees Ahaus, Professor, University of Groningen, Netherlands
In this research we introduce a processing time buffer. This buffer offers new opportunities in services, especially healthcare. The study indicates underlying mechanisms, and discusses the buffer’s consequences. We argue that processing time can be used as buffer, and the impact is dependent on ideas related to quality.

Models to Reduce Patient Wait in a Hospital Pre-Admission Testing Center
Saligram Agnihotri, Professor, Binghamton University, United States
A Pre-Admission Testing Center (PATC) is a hospital unit serving pre-operative patients ready for surgery by performing required tests. Patients can either schedule an appointment in advance or walk-in to receive service. We explain the operation and propose a variety of different models to reduce patient wait in PATC.

A Queuing Model for Internal Wards
Jing Dong, Assistant Professor, Northwestern University, United States
Ohad Perry, Assistant Professor, Northwestern University, United States
We study a queueing model that takes into account the most salient features of patient flow dynamics in large Internal Wards. We also develop analytical tools for efficient performance evaluation of the model. Consequently, evaluating the effects of policy changes and optimizing long-run operating costs are facilitated considerably.

Do Patients Join Longer Queues? Evidence From Canadian Joint Replacement Sugeries
Changmin Jiang, Assistant Professor, University of Manitoba, Canada
It is under debate whether and how more information on the queue length and average wait time influences patients’ decisions of which queue to join. With a dataset of Canadian joint replacement surgeries, this paper aims at empirically testing hypotheses from various predictions in Queuing Theory.

Risk Management in Port Systems
Wolfgang Kersten, Professor, Hamburg University of Technology, Germany
Marius Indorf, Student, Hamburg University of Technology, Germany
Port systems are essential but vulnerable nodes in global supply chains. Recent accidents show, that there is a need for improved risk management methods. Our study focuses on analysing the current state of risk management in port systems as well as areas of improvement based on a mixed methods approach.

Assessment of Risks for Foodgrain Supply Chain in India: A Grey-DEMATEL Approach
Rishabh Rathore, Student, Indian Institute of Technology Kharagpur, India
Jitesh Thakkar, Associate Professor, Indian Institute of Technology Kharagpur, India
Jitendra Jha, Assistant Professor, Indian Institute of Technology Kharagpur, India
We study a novel problem to analyze risks associated with the supply of foodgrains in Indian food supply chain and develop a generic model using Grey-DEMATEL approach to evaluating causal risks. The proposed approach facilitates mitigation of the risks at strategic and tactical level in the food supply chain.
An Optimization Approach for Integrated Resilient Supply Chain Network Design and Operations Under Disruption Risks
Zhimin Guan, Professor, Northeastern University, China
Jin Tao, Student, Northeastern University, China
Hao Wu, Student, Northwestern University, China
Minghe Sun, Professor, University of Texas San Antonio, United States

A mixed binary integer programming model is formulated for integrated design and operations of resilient supply chain networks. Scenarios are used to describe disruptions and uncertainties. A region-wide dual-sourcing strategy, strategic emergency inventories and alternative sourcing facilities are used. The proposed model is solved with the Sample Average Approximation method.

Suppliers Risk Management and Robustness Analysis
June Dong, Professor, State University of New York at Oswego, United States
Jun Ma, Student, University of Calgary, Canada

We consider multiple competitive supply chains that serve multiple demand markets. Manufacturers manages their supply chains to diversify the suppliers while maximizing their profits. We develop a supernetwork model to capture the nature of the problem. Risk parameters are introduced and robustness is analyzed.

Marketplace Engineering
Garrett van Ryzin, Professor, Columbia University, United States

In this talk, I argue that building and growing new marketplace businesses requires a new breed of marketplace engineers - professionals who combine deep understanding of technology, economics and data science. I discuss historical and recent examples of this trend and explore the implications for the field of operations research.

Effects of Rescheduling on Patient No-Show Behavior in Outpatient Clinics
Jiayi Liu, Student, University of Science and Technology of China, China
Jingui Xie, Associate Professor, University of Science and Technology of China, China
Kum Khiong Yang, Professor, Singapore Management University, Singapore
Zhichao Zheng, Assistant Professor, Singapore Management University, Singapore

We study the effects of waiting time and rescheduling on no-show behavior in an outpatient appointment system for both new and follow-up patients. We show that different patients respond to waiting time and rescheduling in significantly different ways, which reveals useful implications for managing no-shows.

Markov Decision Process Based Nurse Night Shift Scheduling by Considering Burn-Out
Na Geng, Associate Professor, Shanghai Jiao Tong University, China
Andrea Matta, Professor, Shanghai Jiao Tong University, China

An experiment was conducted to show there exists a significantly positive relationship between nurse night shifts and burnout level. By considering the burn-out level as state, dynamic programming is used for the night shift scheduling with the objective of minimizing the weighted cost of burnout, payroll, and idle.

Hospital Porter Scheduling With Time-Varying Job Arrivals
Mabel C. Chou, Associate Professor, National University of Singapore, Singapore

We consider a hospital porter system which has two types of porters: a station porter is assigned to a station and only serves that station while a centralized porter serves those stations which do not have any station porter. We derive efficient porter scheduling policy to reduce porter response time.

Unofficial Policy of Hospital Discharge Scheduling: Impact on Patients and the Elderly Care Supply Chain
Jingjing Guan, Reader, City University of Hong Kong, Hong Kong
Eman Leung, Assistant Professor, City University of Hong Kong, Hong Kong
Frank Chen, Professor, City University of Hong Kong, Hong Kong

Using Finite Mixture Model, hospital length of stay was decomposed into discrete distributions that align with hospital bed-utilization reporting criteria, suggesting that MDs’ decisions were also influenced by non-clinical factors. We explore how healthcare services downstream to hospital care affects MDs’ discharge decisions, which in turn impacts on patient’s outcomes.

Evaluation of RFID Investment in the Perishable Products Supply Chain
Xueyi Ai, Student, School of Management, Huazhong University of Science and Technology, China
Lin Wang, Professor, School of Management, Huazhong University of Science and Technology, China
Jinlong Zhang, Professor, School of Management, Huazhong University of Science and Technology, China

We proposed an analytical approach to measure the benefits and costs of RFID investment in the perishable products supply chain. A base mathematical model for RFID investment decision is developed and it is extended to make joint decisions for multiple perishable products. Numerical analysis is conducted with an illustrative study.

Linking Information Management with Process Management for Enhancing Supply Chain Performance
Jordan Toy, Student, Monash University, Australia
This study examines the chained-relationships between both internal and external information management and both internal and external process management and their effects on both internal and external supply chain performance. The research model and the hypotheses was tested using dataset drawn from 202 supply chain managers from Australian firms.

We have implemented a system to track current component stock for inventory management using RFID. A tag is placed on containers with the trial parts so both the supplier and Toyota know what parts have been shipped/stocked. We can also track the movement of high-cost components inside the plant.

When the consumer is not familiar with the product category, the online retailer's assortment may trigger interest in a specific product feature, leading the consumer to refine her search, and focus only on products with this feature. Taking this into consideration, we study the online retailer's optimal assortment decision.

This paper proposes a data-driven methodology to assess the productivity of last-mile operations of a major beverage company in Mexico City. We leverage two years of order and delivery data to evaluate, compare, and explain route performances. Our insights provide guidance to improve last-mile operations in Mexico City.

We analyze shipment data and fulfillment error data for eight-year time period of a large, well-known apparel retailer. Based on our analysis of the joint dataset, we uncover how the complexity of the orders placed by the retailer is associated with the fulfillment errors made by the suppliers.

This paper is developed to test a stylized model of a retailer's financial and operational configuration. We test this model by using US publicly traded firms in retailer sector from 1984 to 2015.

Small retailers in emerging markets operate under very limited cash availability. While they offer informal loans to their customers, suppliers require immediate payment when orders are delivered, which results in an inefficient distribution process. We develop a mathematical model and show when FMCG should accept delayed payments from small retailers.

Logistics for disaster response include four main activities: Assessment, Procurement, Warehousing and Transportation. Decision-making processes extend over time (strategic, tactical and operative decisions), being uncertainty a key point, especially in preparedness. A stochastic optimization mixed 0-1 model for warehousing (location and sizing) planning is presented.

Logistics for disaster response include four main activities: Assessment, Procurement, Warehousing and Transportation. Decision-making processes extend over time (strategic, tactical and operative decisions), being uncertainty a key point, especially in preparedness. A stochastic optimization mixed 0-1 model for warehousing (location and sizing) planning is presented.
We survey the literature in the field of supply chain network analysis in both commercial and humanitarian settings. The whole network perspective of humanitarian research breaks from the broader supply chain domain’s concentration on social capital and is uniquely positioned for the study of adaptive and emergent supply networks.

073-1112 Equity in Pre-Positioning Assets to Support Opening Shelters
Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States
Andy Arnette, Assistant Professor, University of Wyoming, United States

The ability of the Red Cross to support opening shelters is dependent on the pre-positioning of two key types of assets: trailers and caches. We examine approaches for determining the optimal allocation of such resources while considering the importance of equitable solutions from several different perspectives.

073-0785 Transportation in Last Mile Distribution of Humanitarian Aid: Models and Test Cases
Begona Vitoriano, Associate Professor, Universidad Complutense De Madrid, Spain
Jose Maria Ferrer, Assistant Professor, Universidad Complutense De Madrid, Spain
M. Teresa Ortuno, Associate Professor, Universidad Complutense De Madrid, Spain
Alfonso Pedraza-Martínez, Assistant Professor, Indiana University, United States
Gregorio Tirado, Lecturer, Universidad Complutense De Madrid, Spain

Planning for the last mile distribution of humanitarian aid during a disaster response is developed based on information changing over time, as the assessment and operations progress. Several models are being developed with different assumptions. These assumptions and several realistic cases on disasters that actually happened will be shown.

073-2004 Optimal Vaccine Administration Policies Using Multi-dose Vials of Different Sizes
F. Erenay, Assistant Professor, University of Waterloo, Canada
Gizem Nemrutlu, Assistant Professor, University of Waterloo, Canada
Osman Ozaltinb, Assistant Professor, North Carolina State University, United States
John Papastergiou, Assistant Professor, Shoppers Drug Mart, Canada
Nancy Waite, Assistant Professor, University of Waterloo, Canada

We analyse the optimal administration of pediatric vaccines using different sizes of multi-dose vials using an MDP that maximizes expected number of doses administered. The model determines what vial size to open and when to terminate daily vaccination service. The proposed optimal policies may cost-effectively improve the current practice.

073-2005 Scheduling Interval Optimization in Healthcare Clinics Under Patient No-Show and Cancellation Behavior
A.G. Leeflang, Assistant Professor, University of Twente, Netherlands
Maria Martinez, Assistant Professor, Mayo College of Medicine, United States
Mustafa Sir, Assistant Professor of Healthcare Systems Engineering, Mayo Clinic, United States
Esra Sir, Assistant Professor, Mayo Clinic, United States
Kalyan Pasupathy, Associate Professor, Mayo Clinic, United States

Patient no-shows and cancellations are a major problem to clinics, as they compromise clinic operational efficiency. We determine optimal scheduling intervals such that the impact of no-shows and cancellations is minimized, against a cost of rejecting patients. Where the majority of the literature only includes a fixed no-show rate, we...

073-0973 The Three Green IT Groups: Pre-Business, In the Business, Post-Business
Davis Alves, Student, Florida Christian University, Brazil
Sandra Inácio, Professor, Florida Christian University, Brazil
Mark Tunu, Student, Universidade Municipal de São Caetano do Sul, Brazil
Luíza Pedroza, Student, Universidade Municipal de São Caetano do Sul, Brazil
Renan Meio, Student, Universidade Municipal de São Caetano do Sul, Brazil

This research proposes a standardization that facilitates the implementation of Green IT practices within companies. It shows the theoretical model formed by three groups of Green IT practices: Pre-Business, in the Business and Post-Business. It is hoped that this theory will contribute as a guideline for companies.

073-1098 Environmental Management Research in China and Future Agenda: A Literature Review
Yuxiao Ye, Student, Zhejiang University, China
Andy Yeung, Professor, The Hong Kong Polytechnic University, China
Baofeng Huo, Professor, Zhejiang University, China
Environmental management has become a critical concern due to severe industrial pollution in China. With growing literature, it is necessary to synthesize the overall state of art of research and propose research agenda. We review antecedents, outcomes, and contextual factors of environmental management in China, and offer future directions.

073-0676 Environmental Management Practices and Its Impact on Operational and Environmental Performance from a Developing Country
Samuel Famiyeh, Senior Lecturer, GIMPA, Ghana
Ebenezer Adaku, Senior Lecturer, GIMPA, Ghana
Charles Amoatey, Lecturer, GIMPA, Ghana

Environmental management practices have not received much attention in the literature, especially within developing country environments where pollution, ineffective regulations and lack of technology present overwhelming challenges. This study examines the impact of environmental management practices on firm operational and environmental performance in Ghana in the light of these challenges.

073-1745 Greening the Supply Chain: An Experience From a Developing Economy
Dinsaeli Asante - Darko, Lecturer, GIMPA, Ghana
Samuel Famiyeh, Senior Lecturer, GIMPA, Ghana
Ebenezer Adaku, Senior Lecturer, GIMPA, Ghana

With rising incomes, demand and consumption of goods and services are rising resulting in increasing per capita waste generation in environments where infrastructure for waste management still remain a challenge. This study examines reverse logistic as a tool to effectively manage waste and optimize manufacturing cost in developing country’s environment.

073-0692 Eggs Are Broken, and Now? A Stakeholder Management Perspective of the Volkswagen’s Dieselgate
Matteo Kalchschmidt, Professor, Universita Degli Studi Di Bergamo, Italy
Michela Zambetti, Student, Universita Degli Studi Di Bergamo, Italy

Using the Volkswagen Dieselgate as a case study, this paper aims to provide empirical evidence on the stakeholder management during environmental scandals. A qualitative analysis of the Organization decision making has been performed to compare and evaluate the effectiveness of those actions respect to the ones suggested by the Theory.

073-1877 The Mobility and Future Perspectives
Antonio César Galhardi, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Marcelo Okano, Professor, CEETEPS, Brazil

Social, economic and technological trends seek to understand mobility, creating new urban models. But the reality of what's available does not match the public's aspirations for safe, clean, reliable, and affordable ways to come and go. This article discusses mobility and how people are prepared for future dramatic changes.

073-0093 Port Activity: A Problem of Recurrent Atmospheric Discharges Management in Brazilian Port
Belmiro João, Professor, Pontificia Universidade Catolica de Sao Paulo, Brazil
Takeshy Tachizawa, Associate Professor, FacCamp - Faculdade Campo Limpo Paulista, Brazil

The objective of this research is to investigate the dimension of the problem of recurrent atmospheric emissions from the naval activity in the Brazilian port. Due to the combustion characteristics of typical marine engines and the widespread use of refined fuel, that emits significant amounts of SO2, NOx.

073-1232 How the Chemical Industry Can Help Brazil to Meet Its Greenhouse Gases Emission Reduction Targets
Cláudia Freitas, Student, Centro Paula Souza, Brazil
Maria Lúcia Da Silva, Professor, Universidade De Sao Paulo, Brazil

To avoid the global warming, the United Nations Framework Convention on Climate Change established that each country defines its greenhouse gases emissions targets, the nationally determined contributions. This paper presents how the chemical industry sector can help Brazil to reach its goal by investing in new technologies as exploratory study.

073-0382 Fostering Responsibility In Supply Chains: Are Existing Practices Effective?
Avijit Raychaudhuri, Student, Nanyang Technological University, Singapore
Fang Liu, Assistant Professor, Nanyang Technological University, Singapore
S. Viswanathan, Professor, Nanyang Technological University, Singapore

Firms sourcing from inadequately regulated locations usually incur financial and reputation damages when their suppliers violate supply chain responsibility standards and regulations. One way to improve supply chain responsibility is to have the firms invest in their suppliers to reduce the possibility of violations.

073-0774 Should You Buy a New Iphone: How Technology Improvements Impact Lifecycle Emissions
Hailong Cui, Student, University of Southern California, United States
Greys Sosic, Associate Professor, University of Southern California, United States

We consider product categories with nontrivial carbon emission from product usage and evaluate environmental and financial impacts when products are used over multiple generations vs. when they are upgraded regularly. We aim to provide guidelines that would assist policy makers in designing incentives for manufacture of more environmentally friendly products.
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| 073-0827 | Consumer Perceptions of Return Policies | Yue Cheng, Student, Penn State University University Park, United States  
Meg Meloy, Professor, Penn State University State College, United States  
V.D.R. Guide, Professor, Penn State University University Park, United States | Sunday, 08:00 AM - 09:30 AM, Regency E | Track: Behavior in Operations Management |
| 073-0541 | Top Management Commitment and Leadership and Social Capital: How they Interact to Influence Project Success | Kwasi Armao-Gyampah, Professor, University of North Carolina Greensboro, United States  
Jack Meredith, Professor, Wake Forest University, United States | Sunday, 08:00 AM - 09:30 AM, Regency E | Track: Behavior in Operations Management |
| 073-1688 | A Behavioral Analysis on the Use of an Intermediary in Manufacturing Outsourcing | Qiong Chen, Assistant Professor, University of Science and Technology of China, China  
Aleda Roth, Professor, Clemson University, United States  
Gulru Ozkan-Seely, Assistant Professor, University of Washington Bothell, United States  
Fred Switzer, Professor, Clemson University, United States | Sunday, 08:00 AM - 09:30 AM, Regency E | Track: Behavior in Operations Management |
| 073-0266 | Liminality - A Systematic Study of Threshold Paradigms on Digitalisation and Its influence on Organisational Life | Haris Omar, Director, 327/2A, Peradeniya Road, Kandy, Sri Lanka  
Maneesh Kumar, Senior Lecturer, Cardiff University, United Kingdom | Sunday, 08:00 AM - 09:30 AM, Regency E | Track: Behavior in Operations Management |
| 073-0290 | Managerial Decision Making and Expert Power in the Context of Inter-Firm Relationships | Anto Verghese, Assistant Professor, University of Wisconsin-Whitewater, United States  
Xenophon Koufteros, Professor, Texas A&M University College Station, United States  
Haipeng (Allan) Chen, Associate Professor, Texas A&M University College Station, United States  
Luis Gomez-Mejia, Professor, Arizona State University, United States | Sunday, 08:00 AM - 09:30 AM, Regency E | Track: Behavior in Operations Management |
| 073-0545 | Optimal Ordering Decisions with Demand Forecast Update and Bank Credit Financing | Zhengmao Ye, Student, University of Science and Technology of China, China | Sunday, 08:00 AM - 09:30 AM, Regency F | Track: Behavior in Operations Management |
| 073-1545 | The Behavioral Bayesian Newsvendor in a Supply Chain | Ju Myung (J.M.) Song, Student, Rutgers Business School, United States | Sunday, 08:00 AM - 09:30 AM, Regency G | Track: Empirical Research in Operations Management |
| 073-0300 | Prospecting Behavior of a News-vendor | Chirag Surti, Assistant Professor, Adelphi University, United States | Sunday, 08:00 AM - 09:30 AM, Regency G | Track: Empirical Research in Operations Management |
| 073-1708 | Reporting to Multiple Managers and Worker Performance: An Empirical Study | Athena Tsouderou, Student, Instituto De Empresa, Spain | Sunday, 08:00 AM - 09:30 AM, Regency G | Track: Empirical Research in Operations Management |
Workers in modern organizations are often assigned tasks by different managers at the same time. While this practice opens the opportunity for higher worker utilization, it is said to hinder worker performance due to conflicting priorities and role-taking. We empirically investigate this contention in an application maintenance organization.

**073-0493**  The Impact of Collective Intelligence Technology on Operational and Social Performance  
Winston Ng, Student, The Hong Kong Polytechnic University, Hong Kong  
Rachel Yee, Associate Professor, The Hong Kong Polytechnic University, Hong Kong  
Andy Yeung, Professor, The Hong Kong Polytechnic University, China

Organizations increasingly rely on the distributed knowledge and capabilities of external individuals at a collective level for business growth. Meanwhile, external individuals expect organizations to have higher operational and social performance. We propose that the adoption of collective intelligence technology affects corporate operational and social performance.

**073-0457**  Lean Leadership Competencies: A Multi-Method Study  
André Seidel, Student, Federal University of Rio Grande do Sul, Brazil  
Tarcisio Saurin, Professor, Universidade Federal Do Rio Grande Do Sul, Brazil  
Giuliano Marodin, Assistant Professor, University of South Carolina, United States  
Jose Ribeiro, Assistant Professor, Universidade Federal Do Rio Grande Do Sul, Brazil

This study aimed to define the individual leadership competencies that are necessary to implement and sustain Lean Systems. A multi-method approach was performed to develop and validate the lean leadership competencies. Data collection involved a literature review, interviews with experts and an empirical survey answered by 91 respondents.

**328**  Sunday, 08:00 AM - 09:30 AM, Cedar A  
Session: Case Studies and Optimization  
Chair(s): Dan Bumblauskas  
Track: Public Sector Operations Management

**073-0380**  A Multi-Objectives Procurement Planning Model for Indian Food Program  
Maheswar Singha Mahapatra, Student, Indian Institute of Technology Kharagpur, India  
Biswajit Mahanty, Professor, Indian Institute of Technology Kharagpur, India

Two important objectives of Indian food program include price support to farmers in the form of minimal price variation across the procuring states and minimizing operational cost of distribution. To achieve these conflicting objectives, a multi-objective procurement planning model is proposed in this paper using NSGA-II.

**073-1833**  A PESTLE Perspective Of Electronic Government (e-Government) - The Case of Andhra Pradesh  
sundar balakrishna, Director E-services delivery, Indian Institute of Management Ahmedabad, India  
Venkataramanaiah Saddikuti, Associate Professor, Indian Institute of Management Lucknow, India  
neta nagar, managing director, Accenture, Finland

PESTLE (political, economic, social, technological, legal, and environmental) analysis is used by firms to assess the macroeconomic environment and shape strategies when launching a new product. This study applies PESTLE to analyze successful and failed e-government projects from the Indian state of andhra pradesh, and draws insights for future e-government.

**073-0007**  Cedar Falls Community Main Street: A Public Sector OM Case  
Kishor Sapkota, Student, University of Northern Iowa, United States  
Daniel Bumblauskas, Assistant Professor, University of Northern Iowa, United States

This study focuses on operational business development in the Cedar Falls, Iowa downtown region. A survey instrument was developed and deployed, along with interviews and online interaction, and respondent data was analyzed. The survey found the business types most suggested by respondents and specific recommendations are provided.

**329**  Sunday, 08:00 AM - 09:30 AM, Cedar B  
Session: Procurement and Coordination  
Chair(s): Toyin Clottey  
Track: Purchasing and Supply Management

**073-0574**  Fill Rate Analysis for a Supplier with Multiple Customers  
James Minas, Assistant Professor, Suny New Paltz, United States  
Babak Abbasi, Associate Professor, Royal Melbourne Institute of Technology, Australia  
Osama Alamr, Student, Royal Melbourne Institute of Technology, Australia  
Seyedeh Hosseinifar, Lecturer, Deakin University, Australia  
Doug Thomas, Professor, Penn State University University Park, United States

We analyze the finite horizon fill rate for a supplier with multiple customers. We consider the impact of: performance review period length, service policy and correlation of customers’ demands on the fill rate distribution. Our findings provide insights that can assist suppliers in the design and negotiation of SLAs.

**073-0500**  Joint Procurement and Pricing Problem in the Presence of Stochastic Market Environments  
Ping Su, Assistant Professor, Hofstra University, United States  
Xiangling Hu, Associate Professor, Grand Valley State University, United States

We assume that a newsvendor has a particular time period before the selling season to make a one-time “time-flexible” purchase from suppliers differing in fluctuating price processes, and then sets the price to satisfy the price-sensitive stochastic demand. We develop a reality-adaptable solution algorithm to simplify the procedure.

**073-0984**  Optimization of Existing Sourcing Methods with Respect to the Challenges in Tier-1 Indian Automotive Industry  
Samarjit Gill, Student, National Institute of Industrial Engineering, Mumbai, India
Sunday, 08:00 AM - 09:30 AM

Traditional price focused sourcing strategy is inefficient to cater the increasing technological product complexity in the “Tier 1” automotive industry in Indian market. This paper presents a tested, optimized, collaborative and cooperative sourcing strategy with standardized process. This results in long-term sustainable value?to?price relationship with focus on overall value proposition.

073-0483  Sourcing and Procurement Coordination in Multi-Division Firms
Fang Fang, Assistant Professor, California State University LA, United States
Harithara Natarajan, Associate Professor, University of Miami, United States

Large firm must coordinate multiple divisions’ procurement activities to leverage volume discounts from suppliers. Facing such a procurement coordination problem, we examine how a firm can design transfer prices to maximize firm-wide cost savings considering divisional off-contract buying. Our analysis of commonly-used transfer pricing rules shows interesting impacts on vendor

073-0816  Evaluating the Sharing of Information When Sourcing Recovered Materials for Eco-Products
Toyin Clottey, Associate Professor, Iowa State University, United States
WC Benten, Professor, Ohio State University, United States

Legislation and competition to have a “green” image have motivated companies to look at ways of producing “eco-products” by utilizing recovered materials. The delivery lead-times of recovered materials are typically more variable than those of virgin material. We develop models to evaluate cost implications of sharing delivery progress information.

073-1734  Block the Ad-Block Users? Not Always
Mannmohan Aseri, Student, University of Texas Dallas, United States
Milind Dawande, Professor, UT Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States
Vijay Mookerjee, Professor, University of Texas Dallas, United States

Ad-Blockers are software which remove ads from the users’ browsers when they access a website on internet. Publishers face a trade off of allowing or not allowing an ad-block user on their websites. Using a game theoretic model we obtain conditions under which websites should blocks the ad-block user.

073-1777  Do Consumers Behave the Same? A Comparison of Online and Offline Price Effects
Luna (Xingyue) Zhang, Student, Lehigh University, United States
Yuliang Yao, Associate Professor, Lehigh University, United States
Weija (Daisy) Dai, Assistant Professor, Lehigh University, United States

Using transaction level data from a large retail chain, we estimate with-category and cross-category price elasticities for both online and offline sales channels. Based on our structural model, we also analyze the expected impact of product stockout on the other category for different channels.

073-1927  Taxes and Equity Investment: Evidence From Equity Crowdfunding
Wei Chen, Assistant Professor, University of Arizona, United States
Mingfeng Lin, Assistant Professor, University of Arizona, United States

Given the positive externality that entrepreneurial activities bring to the economy, governments around the world have routinely resorted to various incentives to spur entrepreneurship. In this paper, we empirically study whether and how investments in early stage businesses respond to tax incentives.

073-2053  Does Sequencing Matter for Social Media Campaigns?
Rajiv Garg, Assistant Professor, University of Texas Austin, United States
Parshuram Hotkar, Student, McCombs School of Business, United States

With increasing network size and heterogeneity of groups on social networks, it is important to understand the impact of sequential advertising to optimize the expenses. In this paper, we build and test a theory (using a field experiment on Facebook and Twitter) around social ad exposure and customer information retention.

073-0168  Cargos Theft on the Roads of São Paulo State: A Scenario of Brazilian Logistics
Lauro Moreira, Student, Universidade Nove De Julho, Brazil
Marcelo Okano, Professor, CEETEPS, Brazil
Marcelo Fernandes, Professor, Universidade Nove de Julho, Brazil

This presents security methods can be adopted in the control and prevention of cargo theft during road transport journeys on the roads of Brazil. Thefts of cargo is one of the biggest difficulties that transport companies face in day-to-day. Statistics reveal terrifying statistics about these problems that cause financial damages

073-0588  Predicting Demand of Product Oil in Gas Stations Based on Data Stream for Distribution Planning
Lijun Sun, Associate Professor, Dalian University of Technology, China
Xiwu Xing, Student, Dalian University of Technology, China

We analyze data stream from liquid-level sensor, and predict the demands and the peak operational time windows of gas stations in the next distribution period to get reasonable customer delivery time windows, in order to avoid vehicles arriving at the peak times and to ensure safe stocks of gas stations.
New errors are often being introduced to real systems posing considerable modeling issues. Maximum likelihood estimates for key parameters that will enable an SPC approach are provided.

Sand-cone model suggests that lasting capabilities result from development of capabilities in the following sequence: quality, dependability, flexibility and cost reduction. We, in light of the experience manufacturing firms make a contingent assessment of the above perspective to examine if the sequence of capability addition is distinct for different industries.

We present the results of a systematic literature review on the use of learning curve models in production and operations management. Sampled papers are classified using a conceptual framework that helps gaining insights into the types of learning curves used and popular application fields.

This paper considers an entrepreneur who designs a reward-based crowdfunding campaign when the campaign provides a signal about the future demand for the product and subsequent Venture Capital (VC) is needed. Specifically, we offer entrepreneurs insights on how to set the goal and the pledge for the campaign.

We study the performance of last-minute selling and opaque selling in vertically differentiated markets. We characterize the advantage and disadvantage of opaque selling and show that they are strikingly different from the horizontal differentiation setting. Moreover, market competition and product damage may add new advantages to opaque selling.

With explosive growth in number of users, marketers have embraced social media as a preferred platform to diffuse and advertise their products. In this study, we propose analytical models to identify influencers (or network seeders) to maximize the reach and effect of an advertisement (or seed) on social media platforms.

Motivated by prevalent—albeit little explored—under-provision in the US healthcare setting, we study a scenario in which costly diagnostic testing is needed to acquire customers' true conditions and the expert's accuracy of diagnosis is unknown to customers. Our work is the first to formally link diagnostic uncertainty and information asymmetry.

We study production process under binomial yield when salvage value for leftover inventories is considered. We prove the concavity of the model, and examine the impact of salvage value on the optimal lot size. Analytical results are also confirmed computationally with the numerical examples generated by Monte Carlo simulation.
073-0372 Strategic Managerial Delegation and Two-Sided Platforms Competition
Lei Bao, Student, Southeast University, China
Yulin Zhang, Professor, Southeast University, China
Vitor Ribeiro, Lecturer, Universidade do Porto - Faculdade de Economia, Portugal
We investigate the output delegation in a two-sided market duopoly. We show that, compared with no-delegation solutions, equilibrium quantities and consumer surplus are higher but platform profits are lower. Furthermore, we show the role of network externalities play when each platform owner determines whether to hire a manager.

073-0551 Leveraging Bankruptcy Costs to Improve Supply Chain Performance
Diwakar Gupta, Professor, University of Minnesota, United States
Yibin Chen, Student, University of Minnesota, United States
We study two net-terms trade credit contracts with bankruptcy costs, information asymmetry and transaction costs. Our models provide a possible explanation for the prevalence of debt forgiveness in practice. We show that the supplier, by contracting and preannouncing forgiveness, can leverage the threat of bankruptcy to improve supply chain performance.

073-1306 Data-Driven Manufacturer-Retailer Collaboration
Tolga Akcura, Associate Professor, Ozyegin University, Turkey
Zafer Ozdemir, Professor, Miami University, United States
We investigate how and when data-driven collaborations among manufacturers and retailers are beneficial. With data-driven collaborations, either manufacturer can cooperate with either retailer in providing retail value. The results show that the main incentive for these collaborations arise from the efficient allocation of resources.

073-0823 Rethinking the 'Service Transition' Concept: An Empirical Evaluation
Omella Benedettini, Assistant Professor, University of Cambridge, United Kingdom
Andy Neely, Professor, Cambridge University, United Kingdom
This paper proposes a confirmatory, empirical test of a re-conceptualisation of the 'service transition' notion as an expansion, rather than a transition, of manufacturers' offerings towards increasingly advanced services. The results, based on applying cluster analytic and logistic regression techniques to a sample of 110 manufacturers, support this re-conceptualisation.

073-1367 Service Research in Asia - Bibliometric Analysis Revisited
Abhishek Vashishth, Student, Indian Institute of Management, Tiruchirappalli, India
Ayon Chakraborty, Assistant Professor, Indian Institute of Management, Tiruchirappalli, India
We investigate the contribution of Asian researchers towards the literature on service by reviewing over 750 articles published in five top service research journals. This paper provides valuable insights into the nature of academic publishing by Asian researchers in this proliferating area spanning from 2000 to 2016.

073-0293 Servitization II: Applying Service Strategies in Troubled Service Industries
Barry Cross, Assistant Professor, Queens University, Canada
A pedagogical approach to examining the application of service & operations concepts in historically 'service-challenged' industries such as healthcare, banking and telecom. Case examples will provide demonstration of potential improvements. Good enough doesn't have to be!

073-0847 Inputs Categorization in the Service Co-Production: A Framework and Future Directions
Daniel Auler, Student, UNISINOS, Brazil
Rafael Teixeira, Professor, UNISINOS, Brazil
Vidyaranya Gargeya, Professor, University of North Carolina Greensboro, United States
Inputs are vital to the Business-to-Business service co-production process. In this research, we developed an inputs categorization framework considering the similarities and the role inputs perform during the service co-production. The framework is based on a literature review of strategic, economic, marketing, and operations perspectives. We concluded with future directions.

073-1369 Deliver Or Not? Optimal Revenue and Capacity Management Policies for Future Drone-Based Delivery Services
Heng Chen, Assistant Professor, University of Nebraska Lincoln, United States
Senay Solak, Associate Professor, University of Massachusetts Amherst, United States
It is well accepted that retailers and courier companies will use drones to fulfill commercial delivery services in the near future. We study and derive some optimal policies on certain capacity and revenue management decisions that these companies will face in drone-based delivery operations under stochastic demand.

073-1507 Consumer Equilibrium, Pricing, and Efficiency in Group Buying: Theory and Evidence
Liu Ming, Student, University of Maryland, United States
Tunay Tunca, Professor, University of Maryland, United States
Group buying is a pricing mechanism in which the unit price for a good or service declines with higher number of customer sign ups. This paper theoretically and empirically studies consumer equilibrium, pricing, and efficiency of group buying events. We find significant network effects and profit gains for these events.

073-1527 The Bid Adjustment Problem in Search Advertising
Abhishek Pani, Sr. Director, Adobe, United States
Raghu Raghavan, Professor, University of Maryland, United States
Group buying is a pricing mechanism in which the unit price for a good or service declines with higher number of customer sign ups. This paper theoretically and empirically studies consumer equilibrium, pricing, and efficiency of group buying events. We find significant network effects and profit gains for these events.
### Sunday, 08:00 AM - 09:30 AM

**307-0151 Selling Freemium Products to Loss Averse Consumers**

Mehmood Khan, Associate Professor, Abu Dhabi University, United Arab Emirates

We discuss the problem faced by the advertiser in search advertising in the presence of bid adjustments. Recent developments in search advertising created a setting in which the advertiser can target specific demographics by using bid adjustments. We define the bid adjustment problem, propose solution approaches, and present computational results.

**073-2062 Emerging Scholars 1**

Jack Kanet, Professor, University of Dayton, United States

This session is by invitation only. This Program provides new university professionals in OM with career-building advice in developing excellence in their personal programs of teaching, research, and service. The program is highly interactive and features internationally recognized senior OM scholars as discussion leaders.

**073-1083 Introducing Sustainability to MBAs**

Robert Klassen, Professor, University of Western Ontario, Canada

We will explore how sustainability topics might be structured for core and elective MBA courses, both for those students who already are convinced that business and sustainability must be integrated, and for those who are not.

**073-1722 Teaching Sustainable Business to Executive MBAs**

Beril Toktay, Professor, Georgia Institute of Technology, United States

The Scheller College of Business has a module dedicated to sustainable business in its executive MBA program’s first semester and takes a team-teaching approach to this course. This session will discuss our learnings from the first three years of teaching this course.

**073-1746 Teaching Sustainable Operations to Undergraduate Students**

Gylvan Souza, Professor, Indiana University Bloomington, United States

In this talk, I will provide my perspectives on teaching my elective course, sustainable operations, to undergraduate students at Indiana University. I will discuss both content and pedagogy of the course, such as the use of ForClass for case discussions, as well as short in-class assignments.

**337 Sunday, 08:00 AM - 09:30 AM, Larch**

**Chair(s):** Jack Kanet

**338 Sunday, 08:00 AM - 09:30 AM, Madrona**

**Chair(s):** Ravi Subramanian

**Track: Teaching/Pedagogy in P/OM**

**Track: Panels, Tutorials, Meetings**

**307-1386 Development of Social Value Framework to Support UK Local Government**

Zoe Michaelides, Lecturer, 1979, United Kingdom

This research reviews how Social Value initiatives in the procurement of services and goods positively impacts Smart Procurement of Public Infrastructure services. The research developed a collaborative framework supporting 15 Local Authorities in the UK, to provide Social Return on Investment (SROI) measurement, via Social Impact investment bonds (SIB).

**307-1816 Supply Chain Management Sustainability Practices of Vietnamese Firms**

Tung Nguyen, Lecturer, International University - Vietnam National University of Ho Chi Minh City, Vietnam

An NVivo analysis of corporate sustainability reports (CSRs) of 19 leading corporations operating in Vietnam has shown that in this developing economy the concept of Sustainable Supply Chain Management (SSCM) is still nascent and only a few common sustainability practices are being realized in light of UN Global Compact principles.

**307-0819 Influence of Ethical Practices on Sustainable Supplier Selection in UK Furniture Industry**

Waleed Alhuzaimi, Procurement Head, Private Sector, Saudi Arabia

Arvind Upadhyay, Senior Lecturer, University of Brighton, United Kingdom

This research work investigates the influence of ethical practices on sustainable supplier selection in UK furniture industry. Semi-structured interviews are used as a data collection method. The interim results show that the process of selecting suppliers is flexible and that supplier selection is integrated with ethical practices.

**307-1698 Motivators of Social Sustainability in Healthcare in the UAE**

Mehmood Khan, Associate Professor, Abu Dhabi University, United Arab Emirates
The objective of this study is to develop a reliable framework for measuring the extent of motivation for social sustainability among the stakeholders in healthcare facilities in the UAE. EFA and CFA were used to investigate and validate the relationship among dominant factors.

073-1313  How Employee Involvement and Development Practices Influence Firm Economic Performance through Social Sustainability Performance
Robert Sroufe, Professor, Duquesne University, United States
Venugopal Gopalakrishna-Remani, Assistant Professor, University of Texas - Tyler, United States
We examine social sustainability relationships with survey data from three samples and 542 employees across industries. The study focuses on internal stakeholders and argues that employee involvement and employee development can make an important contribution to firm financial performance through an emerging capacity to influence the social sustainability performance.
### 343  Sunday, 09:45 AM - 11:15 PM, Evergreen A  
**Session:** Issues in rural and longterm healthcare  
**Chair(s):** Matt Garcia

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<tr>
<th>Paper Code</th>
<th>Title</th>
<th>Authors</th>
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| 073-1284   | A Cluster Analysis of Competitive Strategies Among Georgia’s Critical Access Hospitals | Kwabena Boakye, Assistant Professor, Georgia Southern University, United States  
Mark Hanna, Professor, Georgia Southern University, United States  
Christian Rossetti, Assistant Professor, Georgia Southern University, United States |
| 073-0051   | Culture Centric Process Improvement in Healthcare                      | Daniel Bumblauskas, Assistant Professor, University of Northern Iowa, United States  
Matt Garcia, Chief Business Development and Process Improvement Officer, University of Northern Iowa, United States |
| 073-0351   | Patient Flow Through Healthcare                                        | Jillian Berry Jaeker, Assistant Professor, Boston University, United States |
| 073-0803   | Overload in a Broken System: The Impact of Workarounds and Thorough Care on Pressure Ulcers | Sarah Zheng, Student, Boston University, United States  
John Gardner, Assistant Professor, Brigham Young University, United States  
Anita Tucker, Associate Professor, Boston University, United States  
Roger Bohn, Professor, 1979, United States |
| 073-0981   | Medical Device Reps in the OR: How and When Do They Matter?             | Bethany Sheridan, Student, Harvard University, United States  
Robert Huckman, Professor, Harvard University, United States |
| 073-1520   | The Effects of Discrete Workshifts on a Non-Terminating Service System | Robert Batt, Assistant Professor, Wisconsin School of Business, United States  
Diwas Kc, Associate Professor, Emory University, United States  
Bradley Staats, Associate Professor, University of North Carolina Chapel Hill, United States  
Brian Patterson, Assistant Professor, University of Wisconsin Madison, United States |

### 344  Sunday, 09:45 AM - 11:15 PM, Evergreen B  
**Session:** Empirical Studies in Healthcare Operations (II)  
**Chair(s):** Hummy Song

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<tr>
<th>Paper Code</th>
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Brian Patterson, Assistant Professor, University of Wisconsin Madison, United States |

### 345  Sunday, 09:45 AM - 11:15 PM, Evergreen C  
**Session:** Managing Disruptions and Resources  
**Chair(s):** Narendra Singh

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<tr>
<th>Paper Code</th>
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| 073-0881   | Mitigating Disruption Risks in Delivery Supply Chains to Serve Contracted Customers | Mert Hakan Hekimoglu, Assistant Professor, Rensselaer Polytechnic Institute, United States  
John Park, Assistant Professor, Syracuse University, United States  
Burak Kazaz, Professor, Syracuse University, United States |
| 073-1322   | Accounting for Cost and Interdependency of Supply Chain Risk Mitigation Strategies: A Frontier Approach | Sriram Narayanan, Associate Professor, Michigan State University, United States |
Supply chain risk mitigation involves the efficient deployment of resources to minimize the financial impact of a disruption to the flow of goods through a supply chain. Thus, we propose a network data envelopment analysis (NDEA) model for performance evaluation of risk mitigation systems.

073-1371 Buyback and Risk Sharing Contacts to Mitigate the Supply and Demand Disruption Risks
Rajen Tibrewala, Professor, New York Institute of Technology, United States
Puromhottam Meena, Assistant Professor, New York Institute of Technology, United States

This paper investigates the dual sourcing problem under supply and demand uncertainty. An analytical model is proposed using the risk-sharing contract with the primary supplier and buyback contract with the backup supplier to mitigate the risks of demand uncertainty, supply disruptions, and random yield in a two-echelon supply chain.

073-1460 Mitigation of Disruption Risk: More Inventory or More Backlogging
Xiaobo Ding, Student, Cornell University, United States
William Schmidt, Assistant Professor, Cornell University, United States

Using detailed supply chain and operational data from a heavy equipment manufacturing firm, we examine how the firm's disruption exposure changes with normal inventory cycles. We also show how different strategies can mitigate the firm's disruption exposure.

073-1349 Managing Used Products: Who Should Refurbish?
Ahmed Timoumi, Assistant Professor, Indian School of Business, India
Narendra Singh, Assistant Professor, Indian School of Business, India

We study a supply chain where a manufacturer sells new products through a retailer and decides whether to refurbish used products itself or to let the retailer refurbish them. We examine whether and when should a manufacturer allow the retailer to refurbish the used products.

073-1392 Investigating Workload Assignment at an Outpatient Clinic with Two Classes of Patients and Providers
Yann Ferrand, Assistant Professor, Clemson University, United States
Uday Rao, Professor, University of Cincinnati, United States

In an outpatient clinic, we investigate workload assignment when the physician and the physician's assistant can handle part of the patient visit and also work collaboratively. We study implications for patient scheduling and for clinic throughput.

073-1528 Design of Operational Policies to Reduce Length of Stay in Emergency Departments
Cheng Zhu, Student, Mcgill University, Canada
Beste Kucukyazici, Assistant Professor, Mcgill University, Canada

From ED decision makers' perspective, we first decide the optimal specialist response policies for time-dependent patient arrivals, and then propose the optimal patient prioritization policies accordingly, in order to reduce the total LOS. Parameters are derived from 40,000 annual ED visits in a local hospital, and verified with ARENA simulation.

073-0703 The Impact Of Implementing Full Capacity Protocol On The Operational Performance In An Emergency Department
Lu Wang, Student, University of Kansas, United States
Suman Mallik, Associate Professor, University of Kansas, United States

Full capacity protocol (FCP) is a set of guidelines to coordinate the patients flows when the emergency department (ED) is overcrowded. We present an empirical study to determine the effectiveness of FCP and its trigger conditions.

073-0143 Application of Absorbing Markov Chain for Life Cycle Assesment of Clothes Reuse in Nordic Countries
Manoj Paras, Student, Gheorghe Asachi Technical University of Iasi, Romania
Rudrajeet Pal, Assistant Professor, University of BoråS, Sweden
Antonella Curteza, Professor, Gheorghe Asachi Technical University of Iasi, Romania

The paper has develop a model to count the number of cycles or trips that clothing product makes in reused based close loop cycle. The proposed model tested to study the textile waste flow in the Nordic countries. Result indicates clothes reuse is highest in Denmark whereas lowest in Finland.

073-0370 Parametric Sensitivity Analysis of Demand/Supply Characteristics in the Presence of Correlation
S. Yasaman Amirkiaae, Student, University of North Texas, United States
Prior research has investigated optimal strategies for modification of demand/supply characteristics as measured by lead time mean/variance and demand variance to improve the performance of the supply chain. We show that considering correlated demand and lead time complicates matters considerably but leads to more generalized and robust recommendations.

This paper first investigates the impact of the sustainability, sourcing, manufacturing, and delivery practices on supply chain performance. Further, we proposed an integrated model based on the partial least squares and analytical hierarchy process techniques to compute the level of the overall supply chain performance index (SCPI).

In this work, we investigate the profitability of a collaboration between firms when designing their distribution schema in the context of sensitivity of demand to market offers. The collaboration is shaped by the sharing of the storage-throughput capacity which should improve the firms’ distribution capabilities in terms of response time.

In practice, methods for forecasting returns belong either to a time-series or a lagged sales family, both of which first aggregate the transactions data and then perform the prediction. We propose a new technique that takes an alternative route by using an econometric model to predict first and then aggregate.

For a retailer, omnichannel retailing practices require significant investment, yet hold the promise of enhancing revenue streams from both online and offline channels. We assess this promise by using transactional data from a national retailer to analyze the impact of ship-to-store capability on a retailer’s performance.

We study an OEM deciding on: (1) the use of a common component or dedicated components for her systems; (2) the component reliability; (3) the spare parts stock. Via an asymptotic LCC analysis, we how when commonality becomes attractive, and how a common component’s reliability compares to dedicated components’ reliabilities.

We examine a firm’s salesperson compensation strategy and number of stores in plural distribution channel with customer satisfaction applied. While customer’s satisfaction level deers to the distribution channel, the firm tries to find the optimal compensation scheme and the number of stores for both direct and retail channels.
Achieving inventory accuracy is a key challenge for retailers. This research targets to develop and evaluate an efficient procedure to enhance inventory accuracy by defining how the limited counting capacities of store employees should be used.

**073-0255**  The Impact of Retail Store Execution on Sales: Understanding Product Characteristic Effects and Substitution Effects  
John Aloysius, Associate Professor, University of Arkansas, United States  
Bill Hardgrave, Professor, Auburn University, United States  
Sandeep Goyal, Assistant Professor, University of Louisville, United States

Better on-shelf availability can improve sales. A field experiment with a large general merchandise retailer evaluates the effect on sales from improved on-shelf availability due to better in-store execution. Product characteristic effects and substitution effects provide an understanding of how the findings may generalize across product categories.

**073-0310**  Shoppers' Propensity for Purchase and Its Impact on Salespeople Productivity  
Chien-Ming Chen, Assistant Professor, Nanyang Technological University, Singapore  
Howard Hao-Chun Chuang, Associate Professor, National Chengchi University, Taiwan, Republic of China

This paper empirically examines how shoppers’ propensity for purchase may influence the effect of shoppers’ traffic variations and labor-to traffic match on salespeople’s productivity. Our results show that the shoppers’ propensity can significantly influence salespeople productivity through its moderation effects on the main independent variables.

**073-0462**  Making Sense of Humanitarian Operations: The 2010 Pakistan Floods  
Diego Vega, Assistant Professor, ??????, France  
Mauricio Rodríguez, Student, NEOMA Business School, France

This paper explores the concept of Sensemaking as a coordination mechanism for humanitarian operations. Through a content analysis of situation reports on the 2010 Pakistan floods emergency response, this research shows the relevance of this concept for improving the decision-making process of humanitarian operations undertaken for cyclical weather-related disasters.

**073-1077**  Delivering Strategic Philanthropy Through Humanitarian Supply Chain Collaboration  
Ruth Banomyong, Associate Professor, Thammasat University, Thailand  
Puthipong Julagasigorn, Student, Thammasat University, Thailand

The purpose of this research is to provide a framework on how to implement strategic philanthropy in the context of humanitarian supply chains. This framework explains the modalities where strategic philanthropy can be successfully delivered in collaboration with key humanitarian supply chain actors. A confirming case study will be presented.

**073-0319**  Scenario Planning and Use of Indices to Forecast Refugee Needs  
Marianne Jahre, Professor, BI Norwegian Business School, Norway  
Joakim Kembro, Assistant Professor, Lund University, Sweden  
kzikitza biguri, Assistant Professor, BI Norwegian Business School, Norway

Access to future demand data provides opportunities for developing and testing analytical models in the humanitarian operations context. The paper suggests combining own historical data with public databases for scenario building. However, data quality is an issue and we present results from testing the external validity of the secondary data.

**073-1687**  Antecedents of Household Post-Flood Recovery Effectiveness: A Structural Econometric Analysis of Flooding in Thailand  
Niratcha Tungtisanont, Student, Clemson University, United States  
Aleda Roth, Professor, Clemson University, United States  
Bernardo Quiroga, Assistant Professor, Clemson University, United States

We develop a theory-based model using a service operations strategy lens to address the types of investments which should be made in the “pre” and “during” flood disaster situations in order to maximize effective recovery “afterwards”? To answer this question, we apply an econometric analyses using a dataset of 34,000 households.

**073-1253**  Implementation of a Fleet Management Program in a Humanitarian Organization  
Luk Van Wassenhove, Professor, INSEAD, France  
Harwin De Vries, Student, INSEAD, France

The organization is currently rolling out a vehicle leasing program in 100+ countries covering more than 5000 4X4 vehicles. Our research group is involved in action research to help design parts of the program and its implementation, and track results through scorecards, surveys, and analysis of training programs.

**073-1483**  Improving Personal Protective Equipment Supply Chains for Disease Outbreaks
Supplier Integration (SI) Failures from Within: Salespersons’ Behavioral Constraints to SI Triads

Scott Ellis, Assistant Professor, Georgia Southern University, United States
Jae-Young Oh, Assistant Professor, Eastern Kentucky University, United States
Marianne Jahre, Professor, BI Norwegian Business School, Norway

In an epidemic, demand for personal protective equipment (PPE) spikes. A constrained PPE supply limits humanitarian response. We use data from interviews with humanitarian logisticians to build a system dynamics model of the PPE supply chain in the 2014 Ebola outbreak and use it to identify improvements for future responses.

073-1068  A Vulnerability Model of Transportation Networks Based on Social Costs Analysis for Disaster Preparedness
Victor Cantilllo, Professor, Universidad del Norte, Colombia
Luis Macea, Assistant Professor, Pontificia Universidad Javeriana de Cali, Colombia
Miguel Jaller, Assistant Professor, University of California Davis, United States

This research presents a vulnerability assessment model of transportation networks that allows to identify critical links for the development of high impact humanitarian relief operations. The proposed model is based on an economic analysis of logistical and social costs derived from the humanitarian distribution operations.

073-0485  Supplier Centrality and Auditing Priority in Socially-Responsible Supply Chains
Jiayu Chen, Student, University of Texas Dallas, United States
Anany Qi, Assistant Professor, University of Texas Dallas, United States
Milind Dawande, Professor, UT Dallas, United States

We consider a supply network where buying firms’ brand may be damaged by sourcing from suppliers who fail to comply with socially responsible standards. To mitigate the risk, firms may audit their suppliers. We derive firms’ equilibrium auditing strategy and propose approaches to mitigate the inefficiency.

073-1575  Policing a Self-Policing Firm: Competitive Inspections for Detecting Compliance Violations
Saeed Alizamir, Assistant Professor, Yale University, United States
Sang-Hyoun Kim, Associate Professor, Yale University, United States

We study incentive dynamics among a firm and a regulator that impact environmental performance. The firm inspects its production facility to detect and correct environmental compliance violations. The firm’s primary motive is to deter the regulator from discovering the violation first and avoid financial penalties or threat of shutdown.

073-1607  Managing Social Responsibility in Multitier Supply Chains
Lu Huang, Operations Analyst, Google Inc., United States
Jing-Sheng Song, Professor, Duke University Durham, United States
Robert Swinney, Associate Professor, Duke University Durham, United States

We study the management of social responsibility in a three-tier supply chain. The Tier 2 supplier potentially violates social and environmental standards, resulting in harm to the Tier 0 and 1 firms. Each member of the supply chain can exert effort to improve the responsibility in Tier 2.

073-0477  Managing Audit Evasion
Shouqiang Wang, Assistant Professor, Naveen Jindal School of Management, United States
Francis De Vericourt, Professor, ESMT, Germany
Peng Sun, Professor, Duke University Durham, United States

Companies often have means and incentive to conceal a negative issue, which, if not addressed promptly, results in detrimental consequences on others. Such evasive actions render audits no longer effective in revealing such an issue. We examine how to uncover and remedy it in the presence of evasive actions.

073-1110  Exploring Bridge Formation, Decay, and Transfer in Professional Service Triads
Jas Kalra, Student, Alliance Manchester Business School, United Kingdom
Paul Cousins, Professor, Manchester Business School, United Kingdom

In their seminal paper on service triads, Li and Choi (2009) argued that the non-involvement of services buyer in this triadic relationship after the service has been outsourced leads to suboptimal outcomes. This study provides an empirical elaboration of this theory through a study of 10 professional service supply triads.

073-1110  Supplier Integration (SI) Failures from Withint: Salespersons’ Behavioral Constraints to SI Triads
Jae-Young Oh, Assistant Professor, Eastern Kentucky University, United States
Scott Ellis, Assistant Professor, Georgia Southern University, United States

We consider the following planning problem: given the expected evolution of an epidemic in each village, which villages should be screened when? For a broad class of epidemics, we propose a solution method and analyze optimal planning decisions. Our methods and insights are applied to sleeping sickness control in D.R.Congo.
Supervisor integration in the NPD process suggests that a salesperson loses his/her traditional position of being a sole gatekeeper to communicate with a buying firm. Drawing from sociotechnical system theory, we explore how direct communication of an engineer with a buying firm affects salesperson’s behavioral constraints and supplier performance.

**073-0592 Managing Government Acquisition Risk Through Contract Management: Evidence From MDAPs**  
Olена Rudna, Student, Rutgers University, United States

The prior literature findings on the implication of contracting activities for Major Defense Acquisition Programs (MDAPs) are sparse and inconclusive. We found that types of contracts can be changed over a program execution. We applied text mining techniques to evaluated the effect of contracting dynamics on program cost performance.

**362 Sunday, 09:45 AM - 11:15 PM, Regency C**  
**Session:** Healthcare Service and Data Analytics  
**Chair(s):** changmi jung

**073-1944 Forecasting Risk in Critical Care**  
Artur Dubrawski, Professor, Carnegie Mellon University, United States

Temporal evolution of risk for cardiorespiratory instability in critically ill is a heterogeneous yet systematic process. Most patients who develop this condition follow one of just a few distinct types of risk evolution trajectories. Knowing the most likely trajectory for an individual enables timely preventative treatment and better health outcomes.

**073-1966 Multi-Trajectory Models of Disease Progression**  
Rema Padman, Professor, Carnegie Mellon University, United States  
Daniel Nagy, Professor, Carnegie Mellon University, United States  
Philipp Burchhardt, Student, Carnegie Mellon University, United States

Utilizing a data set consisting of the Electronic Health Records of more than 33,000 patients with chronic kidney disease (CKD), we apply group-based trajectory modeling to detect patient risk groups and uncover typical progressions of CKD and related comorbidities and complications, with classification accuracy of new patients reaching 90%.

**073-1953 Driving Patients for Doctor Consultation Through Infomediaries**  
Sanghee Lim, Assistant Professor, Johns Hopkins University, United States  
Wenjing Duan, Associate Professor, George Washington University, United States  
Jiban Khuntia, Assistant Professor, University of Colorado Denver, United States  
Dobin Yim, Assistant Professor, Fordham University, United States

Using a dataset of 65,000 daily activities of the 21,715 patients in a infomediary dedicated for reconstructive surgeries, this study explores what attributes of a patients' activities in the health infomediary can be useful to determine a higher likelihood of doctor consultation seeking behavior.

**363 Sunday, 09:45 AM - 11:15 PM, Regency E**  
**Session:** Service Quality and Performance  
**Chair(s):** Gyula Vastag

**073-0109 Project Management in the Public Sector - A Picture of Organizations in Comparison With Companies**  
Marcelo Okano, Professor, CEETEPs, Brazil  
Marcelo Fernandes, Professor, Universidade Nove de Julho, Brazil

The purpose is to verify Public sector and the Project Management and what are the main processes. The methods used were the literature review and a case study to analyze the scenario using quantitative evidence obtained through the survey ProfileIT governance.

**073-0443 Qualitative Pre-Modeling: Uncovering the School Resource Acquisition Problem**  
Samantha Keppler, Assistant Professor, University of Michigan, United States  
Karen Smilowitz, Professor, Northwestern University, United States

In this paper, we develop and implement a novel methodology, qualitative pre-modeling (QPM), which involves collecting and analyzing textual field data as a precursor to analytical research. We implement this method to study the school resource acquisition problem, exemplifying QPM’s usefulness in characterizing socially complex operational problems.

**073-1563 Servitizing Public Services**  
Gyula Vastag, Professor, Széchenyi István University, Hungary  
Eva Kovacs, Assistant Professor, National University of Public Service, Hungary  
Markku Kuula, Professor, Aalto University, Finland

Servitization refers to the development of innovative capabilities that complement and enhance product offerings. In this paper, however, we examine, within the framework of the Unified Services Theory (UST), how organizational capabilities can be developed to enhance public services offered by various government agencies or publicly funded entities.

**364 Sunday, 09:45 AM - 11:15 PM, Regency F**  
**Session:** Emerging Interdisciplinary OM Topics  
**Chair(s):** Stanley Fawcett

**073-1668 Messages to Promote Sustainability: Social and Personal Norms**  
Saif Mir, Student, University of Arkansas - Fayetteville, United States  
John Aloysius, Associate Professor, University of Arkansas, United States  
David Hyatt, Assistant Professor, University of Arkansas - Fayetteville, United States
A randomized field experiment at a trucking firm investigates how drivers may be influenced to increase pro-environmental behavior. We manipulate personal and social norms in corporate communications. The most persuasive messages use a descriptive social norm invoking informal beliefs about how individuals in society behave.

073-1772 The Technical Barriers of Loads Density to the Transport Management in Related to the Eco-Efficiency
Washington Luiz Soares, Student, UNISANTOS UNIVERSIDADE CATÓLICA D SANTOS, Brazil
Jonathan Soares, Student, UNIMES - Universidade Metropolitana de Santos, Brazil
Jessica Elise Soares, Student, UNISANTOS, Brazil

The research is about the logistical cost where there is neoliberal exploration of port cost unsustainable to multimodality by Brazilian companies. Maritime laws have been investigated by a cabotage service where innovations produce eco-efficiency to the process of sustainable transport purchases without fiscal benefits proposed by the Brazilian authorities.

073-1422 Islands of Trust in Coercive Contexts: The Optimizing Response of Small Networks in Project Organizations
Milind Padalkar, Professor, BENNETT UNIVERSITY, India
Seji Gopinath, Professor, Indian Institute of Management Kozhikode, India

Construction projects are characterized by standardization in materials and processes, stakeholder complexity, and formal, coercive organizational contexts. From empirical research, we show that small networks characterized by trust among members emerge within such contexts, and deliver positive pay-offs for all players. Management actions could positively or negatively alter these pay-offs.

073-1593 Exploring the Nature of Trust Construction: Virtual and Vicious Cycles
Stanley Fawcett, Professor, Weber State University, United States
Amydee Fawcett, Assistant Professor, Weber State University, United States
Yao jin, Assistant Professor, Miami University, United States
Gregory Magnan, Professor, Seattle University, United States
Marc Day, Professor, Henley Management College, United Kingdom

Trust is a key governance mechanism. Its presence can reduce relationship costs, promote collaboration, and deliver relational rents. Its absence not undermines collaboration but also increases governance, transaction, and opportunity costs. Importantly, we empirically show how the trust-construction process—including signaling—can lead to both virtuous and vicious cycles.

073-0482 Effect of Organizational Culture on Product/Process Innovation Mediated by National Culture
Euibeom Jeong, Student, Korea University, Korea, Republic of (South Korea)
Jebum Pyun, Lecturer, Sookmyung Women'S University, Korea, Republic of (South Korea)
DaeSoo Kim, Professor, Korea University, Korea, Republic of (South Korea)

Organization culture has been considered a crucial factor for the success of innovation. We empirically investigate the effect of organizational culture on product and process innovation, focusing on the mediating role of national culture, using the data gathered from the global manufacturing research group survey.

073-0316 The Effect Organization Culture on the Lean Production Implementation
Zhixiang Chen, Professor, Sun Yat-Sen University, China

This paper studies the impact of organization culture on the implementation of Lean Production based on empirical study data. Four type organization culture characteristics and their relationships with Lean Production implementation and operations performance are examined.

073-0395 Operational Capabilities and Strategic Orientations: The Secret Ingredient
Abdel Latif Anouze, Assistant Professor, QU, Qatar

The aim of this study is to investigate the relationships between operational capabilities, strategic orientations and company performance. A new conceptual model is developed based on operations management and strategic management theories and literature. This model is tested and validated using sample from Middle East and North African Countries.

073-0402 Strategic Capacity Planning Decisions
Randy Napier, Assistant Professor, University of Texas Arlington, United States
Rajat Mishra, Assistant Professor, Stephen F Austin State University, United States
Elton scifres, Professor, Stephen F Austin State University, United States

Market share gap, industry growth and industry concentration are examined to see the moderating effects on the competitive rivalry of the market leader and the challenger. The results are significant and the effects of capacity management of the rival firms have a positive impact on the focal firm.

073-0946 Capacity Planning for O2O On-Demand Delivery System with Self-Scheduling Drivers
Yali Liu, Student, Central University of Finance And Economics, China
Hongyan DAI, Associate Professor, Central University of Finance And Economics, China

There are three capacity plans in current O2O on-demand delivery system, only in-house or self-scheduling drivers, and mix of the two. It is unclear which plan is better, we thus investigate the staffing decisions for the three capacity plans, and compare their cost under G/G/queue framework.

073-0957 Retail-Store Backroom Capacity Planning: Estimating the Effect of Pack Size on Inventory and Space Requirement
Lita Das, Student, Massachusetts Institute of Technology, United States
Chris Caplice, Professor, Center for Transportation and Logistics, United States
Retail managers are often constrained by pack sizes when planning for backroom inventory, which has a significant impact on the allocation and management of store space. We study the effect of tri-level pack size (orderable, storable, and consumable) on optimal backroom space allocation for food & beverage retail industry.

**073-0549** The Comparison of Competitive Advantages in Dyadic and Triadic Structures of Supply Chains
Artur Swierczek, Associate Professor, University of Economics, Poland

The paper aims to demonstrate the benefits derived from relational and network competitive advantages. Data obtained from the sample of supply chains, were fed into the statistical analysis. The findings show that there are significant differences between dyadic and triadic structures of supply chains regarding the benefits of competitive advantage.

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**073-0224** Strategic Positioning and Funding in Global Entrepreneurial Ecosystems
Hyunwoo Park, Lecturer, Georgia Institute of Technology, United States
Rahul Basole, Associate Professor, Georgia Institute of Technology, United States
Raul Chao, Associate Professor, University of Virginia, United States

Using a computational approach based on text analytics, we study strategic positioning choices of 76,153 companies in 191 global entrepreneurial ecosystems. Our analysis leads to robust support for a concave, inverted-U relationship between similarity and funding: too much similarity or too much differentiation reduces the funding received by ventures.

**073-0313** Innovate to Structure or Structure to Innovate?
Marcus Bellamy, Assistant Professor, Boston University, United States

Drawing from secondary data on supply chain relationships, we assess the innovation activity of firms in multiple industries to shed light on mechanisms in a focal firm's supply network that drive innovation as well as innovative firms that drive and influence how supply networks are structured.

**073-1108**

The impact of network position and product characteristics on confidentiality and product performance
Yingchao Lan, Student, Ohio State University, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States
John Gray, Associate Professor, Ohio State University, United States
Brett Massimino, Assistant Professor, Cornell University, United States

While it is believed that extended product development networks play a critical role in product development, evidence is still scarce and confidentiality performance is rarely considered. Using the lens of Social Network Analysis and 11 years of secondary data, we investigate some such relationships in the video game industry.

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**073-1779** The Effect of Rating System Design on Opinion Sharing
Ying Liu, Student, Arizona State University, United States
Pei-yu Chen, Associate Professor, Arizona State University, United States
Kevin Hong, Assistant Professor, Arizona State University, United States

How ratings and reviews reflect consumers' heterogeneous preference? Do ratings complement or substitute textual reviews? How does rating system moderate the interplay? Analysis of empirical data suggests that Multi-Dimensional ratings do not substitute text reviews. MD system primes consumers to generate more comprehensive numerical overall ratings and textual reviews.

**073-0047** Knowledge Growth and Its Effect on Productivity of a Co-Located Software Project
Supriya Ghatak, Student, Indian Institute of Technology Kharagpur, India
Biswajit Mahanty, Professor, Indian Institute of Technology Kharagpur, India

This paper investigates, in the context of co-located software development, knowledge growth of the software development team as well as that of individual team members. A mathematical model is then made use of to obtain insights into the behavior pattern of the knowledge growth and its effect on the productivity.

**073-1828** Fun Shopping - A Randomized Filed Experiment of Gamification
Yi-jen (Ian) Ho, Assistant Professor, Penn State University University Park, United States
Siyuan Liu, Assistant Professor, Pennsylvania State University, United States
Xueming Luo, Professor, Temple University, United States
Lei Wang, Assistant Professor, Penn State University University Park, United States

In this research, we conduct a large-scale randomized field experiment at an top Asian shopping mall to investigate the impact of gamification on customer engagement. The results show gamification does boost user engagement and increase stores' sales. This study provides important implications on how firms could take advantages of gamification.
Sunday, 09:45 AM - 11:15 PM

073-1087 Capacitated k-median Steiner Forest Problem on a Tree
Xiaofan Lai, Assistant Professor, Sun Yat-Sen University, China
Henan Liu, Student, Xi'an Jiaotong University, China
Zhou Xu, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong

We provide exact algorithms for covering all the customers in a tree-shape network using at most k trees, under the objective of minimizing total tree weight, subject to a facility capacity constraint for each tree. These problems have wide applications in both telecommunication and transportation industries.

073-1087 Price and Schedule Rivalry
Achim Czerny, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong
André de Palma, Professor, École Polytechnique, France

We consider two carriers. They simultaneously choose their price and departure time. Linear-quadratic functional forms are used to describe individual passengers' delay costs. We identify departure time choices that ensure the existence of an equilibrium in pure-pricing strategies when passengers have a preference for early relative to late departure.

073-0784 Berth Allocation in a Tidal Port with Channel Flow Control
Lu Zhen, Professor, Shanghai University, China
Zhe Liang, Professor, Tongji University, China

We study an operational-level berth allocation and quay crane assignment problem considering the tides and channel flow control constraints. A mixed-integer programming model is proposed to solve this problem. Then a column generation solution approach is developed on a set partitioning based reformulation of the original model.

073-1061 New Solution Methods for Liner Service Network Design with Transhipment Cost
Jun Xia, Student, Hong Kong Polytechnic Univ, Hong Kong
Zhou Xu, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong

We develop new solution methods to a liner service network design problem that aims to jointly optimize decisions on ship routing, fleet deployment and cargo allocation, with transhipment costs taken into account. Extensive numerical experiments have been conducted to demonstrate the effectiveness and efficiency of the new methods.

073-0460 Improving Micro-Retailer and Consumer Welfare in Developing Economies: Replenishment Strategies and Market Entries
Luyi Gui, Assistant Professor, University of California Irvine, United States
Christopher Tang, Professor, ucla, United States
Shuya Yin, Associate Professor, University of California Irvine, United States

This paper considers micro retailing market in developing economies where efficient distribution channels are lacking, and studies enhancing retailer and consumer welfare via non-profit collaborative replenishment mechanisms.

073-1063 Optimal Patient and Provider Incentives in Funding-constrained Humanitarian Healthcare Service Settings
Mili Mehrotra, Assistant Professor, University of Minnesota, United States
Karthik V. Natarajan, Assistant Professor, University of Minnesota, United States

We analyze how a budget-constrained humanitarian organization managing a healthcare service program should design incentives to the provider and patients to maximize program coverage. We explore how the incentives change with the service offered and operating environment. We also compare the optimal incentive scheme to incentive schemes used in practice.

073-1065 On Rural Energy Challenge in Developing Economies
Qiao-Chu He, Assistant Professor, University of North Carolina Charlotte, United States

Infrastructure investment is crucial to relieve the rural energy hunger and mitigate poverty in developing economies. I shall discuss new technology and operational mechanisms to tackle the rural energy challenge in developing economies.

073-1013 Designing Hydro Supply Chains for Water, Food, Energy, and Flood Nexus
Kwon Gi Mun, Assistant Professor, Fairleigh Dickinson University, United States
Yao Zhao, Professor, Rutgers University, United States
Raza Rafique, Assistant Professor, Lahore University of Management Sciences, Pakistan

We study Water, Food, Energy and Flood Nexus among the most formidable challenges in developing countries. The development of hydropower has the potential to address all these issues in the same time. We apply SCM concepts to water resource development and provide the end-to-end and dynamic perspectives.

073-0951 Examining the Influence Knowledge Exchange in Services Offshoring
Shirish C. Srivastava, Associate Professor, Hec Paris, France

Extent of knowledge exchange between the client and vendor can influence the performance of offshore sourcing contracts. Situating our arguments in the theory of the absorptive capacity of the firm, we examine the joint influence of knowledge transfer and absorptive capacity on offshore contract performance, and delineate useful implications.
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<td>073-0044</td>
<td>Multimodal Event Summarization in Social Media Using Topic Models and Graph-based Ranking</td>
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Zhenyu Liu, Professor, Xiamen University, China

Especially graph databases are constantly gaining popularity among developers as they promise to deliver superior performance. We employ a topic modeling technique based on different modalities to capture the relevance of posts to event topics, and a graph-based ranking algorithm to produce a diverse ranking of the selected high-relevance graph.

073-1346 Why Do Service Firms Manage Online Reviews? An Institutional Perspective
Ying Fan, Assistant Professor, University of Colorado Colorado Springs, United States
Run Niu, Associate Professor, Webster University, United States

Researching online reviews become essential when customers make purchasing decisions. The impact of institutional factors including coercive, mimetic, and normative pressures on service firms’ online review management practices is investigated under different levels of competitive intensity. Moderated regression analysis is conducted using data collected from 207 service managers.

073-1649 Memory and Recall: An Exploratory Study of the Circumstances around Online Review Origination
Jie Zhang, Assistant Professor, University of Victoria, Canada
Rohit Verma, Professor, Cornell University, United States

We explore the relationship between the memory of customer experience and the reviews based on such memory. Specifically, we empirically test the difference in quantitative ratings and text content of online reviews based on free recall and those following structured solicitation.

073-0087 Heteroscedastic Exponential Choice and Its Pricing Implications
Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States
John Semple, Professor, Southern Methodist University, United States

We develop analytical properties of the Heteroscedastic Exponential Choice (HEC) model and demonstrate its estimation using a household panel data of grocery purchases. Unlike MNL and other logit models, HEC easily accommodates error terms with different variances. We explore the pricing implications of this feature of HEC.

073-0740 Continuous Learning for Contextual Bandits with Nonstationary Rewards
John Turner, Assistant Professor, University of California Irvine, United States
Tianbing Xu, Research Scientist, Facebook, Inc., United States
Amelia Regan, Professor, University of California Irvine, United States
Yaming Yu, Associate Professor, University of California Irvine, United States

We study how best to match ads to viewers using high-dimensional contextual features (demographic, browsing behavior) to predict click-through probability. Using Thompson Sampling in a Bayesian framework, our model learns the importance of contextual features while adapting/forgetting over time, capturing changing individuals’ tastes and shifts in the viewing population’s composition.

073-0184 Dynamic Pricing With Customer Upgrades
Oben Ceryan, Assistant Professor, Drexel University, United States
Izak Duenyas, Professor, University of Michigan Ann Arbor, United States
Ozge Sahin, Associate Professor, John Hopkins University, United States

We study a joint implementation of price- and availability-based product substitutions by considering a firm that dynamically replenishes and sets prices for two vertically differentiated products and may offer customers upgrades to the higher quality product. We characterize the optimal policy and investigate the impact of product upgrades on pricing.

073-0596 Dynamic Pricing of Vertically Differentiated Products in the Presence of Consumers Sequential Search
Sami Najafi, Assistant Professor, Santa Clara University, United States
Chi-Guhn Lee, University of Toronto, Canada
Sajjad Najafi, University of Toronto, Canada
Steven Nahmias, Professor, Santa Clara University, United States

We consider a seller offering several vertically differentiated perishable products over multiple periods. In each period consumers sequentially search for and buy the product maximizing their utilities. We show that a perishable product’s price may increase over time, which goes against the common intuition from the revenue management literature.

073-2063 Emerging Scholars 2
Jack Kanet, Professor, University of Dayton, United States

This session is by invitation only. This Program provides new university professionals in OM with career-building advice in developing excellence in their personal programs of teaching, research, and service. The program is highly interactive and features internationally recognized senior OM scholars as discussion leaders.

073-1852 REI Rentals Case: Queueing, Newsvendor, Data, and Sustainability
Damian Beil, Professor, University of Michigan, United States
I will discuss a recent teaching case (REI Rentals, with Wally Hopp) that introduces students to sustainability concepts in the context of a rental system that must be managed using queueing and inventory concepts. General teaching tips and lessons learned from teaching the OM core will also be shared.

073-1869 OM Teaching Innovations at UCLA
Guillaume Roels, Associate Professor, University of California Los Angeles, United States
In this talk, I will review some teaching innovations that we have developed in the OM core at UCLA, including greater focus on technology and higher student engagement.

073-1958 Incorporating Research in the Classroom
William Schmidt, Assistant Professor, Cornell University, United States
Integrating academic research in the classroom can make teaching and learning more engaging and relevant for all participants. I discuss my experience expanding the classroom using academic research.

073-1838 Breakfast at the Paramount: A Case Study on Queuing Dynamics
Ryan Buell, Professor, Harvard University, United States
The Paramount is a 44-seat diner on Charles Street in the Beacon Hill neighborhood of Boston. A favorite among locals and tourists, lines often stretch down the street. A new case focuses on the restaurant's queuing dynamics, using multimedia to teach the analytical and behavioral facets of queues.

073-1231 Supply Chain Deviances: Causes of Non-Compliant Behavior in Supply Chains
Guilherme Zamur, Student, Fundacao Getulio Vargas, Brazil
Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil
Barbara Flynn, Professor, Indiana University, United States
Based on institutional and moral-self theories, we have conducted a discrete-choice experiment with American, Indian and Brazilian managers to test for causes of suppliers' non-compliance with sustainability and ethical codes. Results suggest institutional complexity and supplier's position in the supply chain loose managers' moral-self and increase probability of non-compliant behavior.

073-0712 Ethics in Supply Chain Management: A Systematic Literature Review
Mary Margaret Rogers, Associate Professor, University of New Mexico, United States
Ethics in supply chain management (SCM) is a fragmented, but growing field of study. This work uses a systematic literature review to examine the current state of ethics in SCM to determine common themes of the extant literature and formulate a basis for theoretical development and future research.

073-1822 Examination of Gaps Between GRI Sustainability Reporting Guidelines and Stakeholders Expectations
Henry Aigbedo, Associate Professor, Oakland University, United States
Marina Mattera, Associate Professor, Universidad Europea de Madrid, Spain
Ivan Hilliard, Associate Professor, Universidad Europea de Madrid, Spain
Andriy Shapoval, Researcher, Researcher, United States
The Global Reporting Initiative has become the golden standard for reporting on organizations’ sustainability efforts. Stakeholders play a crucial role in the success of these organizations. Using several industry examples, this study examines gaps between GRI requirements and stakeholders expectations. It also recommends possible ways these gaps can be bridged.

073-1154 Tensions in Sustainable Supply Chain Management: The Case of Social Enterprises
Annachiara Longoni, Assistant Professor, Esade Business School, Spain
Davide Luzzini, Associate Professor, Zaragoza Logistics Center, Spain
Madeleine Pullman, Professor, Portland State University, United States
Research on sustainable supply chain management is debating on prioritization and tensions between environmental, social and economic goals. We conducted a series of case studies on social enterprises—meaning business organizations addressing complex social problems, to investigate what logics are used in supply chain activities to manage multiple sustainability goals.
381 Sunday, 01:15 PM - 02:45 PM, Evergreen A
Session: Models for Optimal Resource Use in Healthcare

Chair(s): Christos Vasilakis

073-0471 The Evolution of Optimisation Efforts in Medication Control and Drug Prescription: A Systematic Review
Claudia Araujo, Assistant Professor, COPPEAD Graduate Business School, Brazil
Olavo Diogo, Student, COPPEAD Graduate Business School, Brazil
Leonardo Marques, Professor, COPPEAD Graduate Business School, Brazil
Alistair Brandon-Jones, Professor, University of Bath, United Kingdom
Christos Vasilakis, Professor, University of Bath, United Kingdom

Patient safety and, in particular, medication management and drug prescription have been increasingly the focus of optimisation efforts. This paper presents the results of a systematic review showing to what extent traditional operations management techniques, such as lean tools, have been adopted to help optimise medication control and drug prescription.

073-0867 Decision Support for the Capacity Management of Endoscopy Devices
Daniel Gartner, Lecturer, Cardiff University, United Kingdom
Günter Edenharter, Lecturer, Technische Universität München, Germany
Dominik Pföringer, Lecturer, Technische Universität München, Germany

Increasing costs of material resources challenge hospitals to stay profitable. Inefficient management of single and multiple use systems can influence hospitals’ material costs substantially. Using mathematical modelling, we develop a decision support tool to determine the cost-optimal mix of endoscopes under demand uncertainty and a user-defined reliability measure.

073-1337 Managing Elective Surgical Procedures Under Stochastic Patient Length of Stay
Hessam Bavafa, Assistant Professor, University of Wisconsin, United States
Lerzan Ormeci, Associate Professor, Koc University, Turkey
Sergei Savin, Professor, University of Pennsylvania, United States

We consider the problem of allocating daily hospital capacity for operating rooms and beds among several types of elective surgical procedures, where each type is distinguished by revenue, procedure duration and stochastic length-of-stay. We characterize optimal portfolio for two types, and propose a heuristic solution for arbitrary number of types.

073-1469 Modelling the use of Patient Activation Measure (PAM) in Complex Patient Care
Evrim Gunes, Associate Professor, Koc University, Turkey
Odysseas Kanavetas, Student, Koc University, Turkey
Lerzan Ormeci, Associate Professor, Koc University, Turkey
Christos Vasilakis, Professor, University of Bath, United Kingdom

We develop a MDP framework to manage care for patients with multiple chronic conditions via a complex care hub. Complex care provision influences the evolution of PAM, an indicator for healthy behavior, which affects the evolution of health state of patients. We explore optimal policies to minimise healthcare costs.

073-0397 Generating Insights Into Care Process Variation Using the Lens of Organizational Routines
Mariana Frangeskou, Student, University of Bath, United Kingdom
Christos Vasilakis, Professor, University of Bath, United Kingdom
Michael Lewis, Professor, University of Bath, United Kingdom

How can we help ensure that patients receive high quality and safe care in today’s increasingly complex health systems? We used qualitative research methods and the lens of organizational routines to generate novel quality improvement insights about the process of acute stroke care by focusing on the sources of variation.

382 Sunday, 01:15 PM - 02:45 PM, Evergreen B
Session: Sourcing/procurement decisions in healthcare

Chair(s): davood golmohammadi

073-0579 A Tale of Two Cities: Hospital Procurement for Implants in USA and South Korea
Vafa Saboori-Deilami, Assistant Professor, Barowsky School of Business, United States
Changseob Yeo, Assistant Professor, Dominican University, United States

Purchasing implantable medical devices is one of the highest expenses of any hospital. Through a comparative study, best practices used by a hospital in the United States have been compared with those of a hospital in South Korea. Several propositions for US hospitals are made based on this descriptive comparison.

073-0321 Modelling Strategies to Manage Sourcing Disruptions in Healthcare Operations
Jitender Madaan, Assistant Professor, Indian Institute of Technology Delhi IIT, India
Parikshit Charan, Assistant Professor, Indian Institute of Management Raipur, India

Healthcare sourcing entails matching health care resources to patient requirements and making sure its availability when they need them. To make sure reduction in risks of unavailability healthcare operations can do sourcing by either diversification or emergency sourcing. This paper demonstrates some novel models to analyze these considerations.

073-1255 Healthcare Sourcing Excellence and Procurement Performance: Evidence from Indian Healthcare Industry
Jurriaan de Jong, Assistant Professor, SUNY At Buffalo, United States
Nallan Suresh, Professor, SUNY At Buffalo, United States

This study investigates impacts of healthcare sourcing excellence as a higher-order competence construct which includes value analysis purchasing. Based on the Indian healthcare industry context, we establish construct and predictive validity on the two principal outcomes of cost and quality improvements, besides providing other insights on healthcare procurement.
### Sunday, 01:15 PM - 02:45 PM

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Title</th>
<th>Chair(s)</th>
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<tbody>
<tr>
<td>073-0745</td>
<td><strong>Healthcare Challenges and Potential Remedies</strong></td>
<td>Davood Golmohammadi</td>
<td>We classify main healthcare challenges and issues into several categories such as payment systems, operations systems and information systems. Advantages, and disadvantages of current systems as well as potential solutions for healthcare operations in the future are discussed.</td>
</tr>
<tr>
<td>073-1962</td>
<td><strong>A Queueing Analysis on Inventory Management in Steel Industry With M/PH/c Queues</strong></td>
<td>George Zhang, Remi Charpin, Aleda Roth</td>
<td>The paper analyzes the inventory problem of hot rolling operations in iron and steel enterprises. We consider an M/PH/c queue to model the inventory problem, and based on the matrix-geometric solution of the model and empirical data analysis, we obtain the optimal inventory policy to minimize the cost.</td>
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<tr>
<td>073-1963</td>
<td><strong>Range Contracts: Risk Sharing and Beyond</strong></td>
<td>Michael R. Wagner, Dorit S. Hochbaum</td>
<td>We introduce the range contract, which allows a buyer to procure from a supplier at a prescribed price any amount within a specified range. The range contract generalizes many common contracts. We demonstrate that both buyer and supplier can benefit, attaining higher risk-adjusted profits than the centralized supply chain.</td>
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<tr>
<td>073-0748</td>
<td><strong>Host National Strategy as Political Risk: A Conceptual Model and Research Agenda</strong></td>
<td>Remi Charpin, Aleda Roth</td>
<td>Political risk has been overlooked in the supply chain literature while it remains one of the environmental factors that influences the most operations and supply chains. We introduce the notion of host national strategy as a political risk source and reveal its implications for operations and supply chains.</td>
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<tr>
<td>073-1961</td>
<td><strong>Strategic Sourcing in BOP Countries</strong></td>
<td>Stella Hua</td>
<td>Sourcing in the bottom of pyramid (BOP) countries is challenging with the lack of infrastructure development, employee training and quality standards. In this paper, we focus on aerospace sourcing in the BOP countries, explore the supply chain risks, and propose a framework for strategic sourcing in BOP countries.</td>
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<tr>
<td>073-0570</td>
<td><strong>Workshop on Teaching Operations Management with Classroom Experiments: Let Students Live the Role</strong></td>
<td>Stephanie Powers</td>
<td>Using class activities to engage students, encourage critical thinking, and apply theory. Can building Legos help students understand inventory management? Does it impact their retention of information? TPOW workshop attendees will participate in class activities related to quality management, supply chain, and MRP. Instructions for implementation and related assessments provided.</td>
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<tr>
<td>073-1750</td>
<td><strong>Optimizing Cancer Prevention Strategies for BRCA Mutation Carriers</strong></td>
<td>Elisa Long, Eike Nohsdurf, Stefan Spiner</td>
<td>BRCA mutation carriers face significantly elevated lifetime risks for breast and ovarian cancer. Prophylactic surgery (bilateral mastectomy, ovary removal, or both) reduces cancer risk but may impact patient quality-of-life. We formulate a Markov decision process model to determine the optimal age to undergo surgery, which we solve via linear programming.</td>
</tr>
<tr>
<td>073-1751</td>
<td><strong>Behavioral Analytics Approach to Design of Weight Loss and Physical Activity Interventions</strong></td>
<td>Yonatan Mintz, Anil Aswani, Phil Kaminsky, Elena Flowers, Yoshimi Fukuoka</td>
<td>We develop a behavioral analytics approach for designing incentives for a large number of myopic agents whose states and utility function parameters are subject to temporal dynamics. A simulation study shows our approach can optimize a weight loss intervention by maintaining efficacy while reducing program costs by up to 70%.</td>
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<tr>
<td>073-1416</td>
<td><strong>Classification in the Presence of Anchoring Bias: An Application to Breast Cancer Diagnosis</strong></td>
<td>Mehmet Ahsen, Mehmet Ayvaci</td>
<td>We classify main healthcare challenges and issues into several categories such as payment systems, operations systems and information systems. Advantages, and disadvantages of current systems as well as potential solutions for healthcare operations in the future are discussed.</td>
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### 073-1345 Prioritizing Hepatitis C Treatment Decisions in U.S. Prisons

<table>
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<th>Author(s)</th>
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<tr>
<td>Turgay Ayer</td>
<td>Assistant Professor, Georgia Institute of Technology, United States</td>
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<td>Can Zhang</td>
<td>Student, Georgia Institute of Technology, United States</td>
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<td>Anthony Bonifonte</td>
<td>Student, Georgia Institute of Technology, United States</td>
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<tr>
<td>Anne Spaulding</td>
<td>Associate Professor, Emory University, United States</td>
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<tr>
<td>Jagpreet Chhatwal</td>
<td>Assistant Professor, Harvard University, United States</td>
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About one out of six inmates in US prisons is infected with hepatitis C virus (HCV). New HCV treatment drugs are very effective, but providing treatment to all inmates is prohibitively expensive, which precludes universal HCV treatment. In this work, we study HCV treatment prioritization decisions in prison systems.

### 073-0173 Financing Choices in Supply Chain, Cooperative Approach

<table>
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<th>Author(s)</th>
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<tr>
<td>Mohamed Ait Mansour</td>
<td>Student, Institut de Gestion de Rennes, Université de Rennes 1, France</td>
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<tr>
<td>Vincent Hovelaque</td>
<td>Professor, Institut de Gestion de Rennes, Université de Rennes 1, France</td>
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<tr>
<td>Jean-Laurent Viviani</td>
<td>Professor, Institut de Gestion de Rennes, Université de Rennes 1, France</td>
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We propose a model where a retailer order its supplies according to his financial capacity using cooperative game. If retailer’s treasury is insufficient, he decides to borrow either with a trade credit or with a bank credit. We explore stakeholders' decisions (retailer, supplier, and bank) in different situations.

### 073-2029 Guarantor Financing in a Four-Party Supply Chain With Leadership Influence

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<th>Author(s)</th>
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<tr>
<td>Tiantian Lin</td>
<td>Student, Zhejiang University, China</td>
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This paper investigates manufacturer and 3PL guarantor financing in a four-party supply chain in three game settings: manufacturer/3PL Stackelberg leadership, and Nash game. We find 1) guarantor advantage for the Stackelberg follower; 2) supply Chain with longer hierarchy may outperform; 3) retailer with bank access may still prefer guarantor financing.

### 073-0510 Joint Optimization of Tracking Capability and Price in a Supply Chain With Endogenous Pricing

<table>
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<th>Author(s)</th>
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<tr>
<td>Bin Dai</td>
<td>Associate Professor, Wuhan University, China</td>
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<tr>
<td>Yangyang Su</td>
<td>Student, Wuhan University, China</td>
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We propose a nonconvex nonlinear programming to jointly optimize tracking capability and price considering the tracking cost and recall cost in a supply chain with endogenous pricing, and find that improving tracking capability can mitigate the effect of double marginalization when only when the tracking cost is large enough.

### 073-0235 Asymptotic Optimality of Tailored Base-Surge Policies in Dual-Sourcing Inventory Systems

<table>
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<th>Author(s)</th>
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<tr>
<td>Linwei Xin</td>
<td>Assistant Professor, University of Illinois Urbana-Champaign, United States</td>
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<tr>
<td>David Goldberg</td>
<td>Assistant Professor, Georgia Institute of Technology, United States</td>
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Dual-sourcing inventory systems are notoriously difficult to optimize. Recently, Tailored Base-Surge (TBS) policies have been proposed as a heuristic and numerical experiments have suggested such policies perform well. We provide such a theoretical foundation by proving a simple TBS policy is indeed asymptotically optimal as the lead time difference grows large.

### 073-0243 Repairable Stocking and Expediting in a Fluctuating Demand Environment: Optimal Policy and Heuristics

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<th>Author(s)</th>
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<tr>
<td>Joachim Arts</td>
<td>Assistant Professor, Eindhoven University of Technology, Netherlands</td>
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<tr>
<td>Rob Basten</td>
<td>Assistant Professor, Eindhoven University of Technology, Netherlands</td>
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<tr>
<td>Geert-Jan van Houtum</td>
<td>Professor, Eindhoven University of Technology, Netherlands</td>
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We consider a single stock-point for a repairable item facing Markov modulated Poisson demand. Repair of failed parts may be expedited at an additional cost. We characterize the optimal expediting policy for a fixed base-stock level and propose heuristics based on asymptotics and special cases.

### 073-1621 Optimal Policies for a Dual-Sourcing Inventory Problem with Endogenous Stochastic Lead Times

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<tr>
<th>Author(s)</th>
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<tr>
<td>Jing-Sheng Song</td>
<td>Professor, Duke University Durham, United States</td>
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<tr>
<td>li xiao</td>
<td>Student, Chinese Univ of Hong Kong, Hong Kong</td>
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<tr>
<td>Hangin Zhang</td>
<td>Professor, National University of Singapore, Singapore</td>
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<tr>
<td>Paul Zipkin</td>
<td>Emeritus Professor, Duke University Durham, United States</td>
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Through a new approach, we obtain optimal ordering policies for a two-source inventory system with Poisson demand and backlogging. The normal supply source, which consists of a two-stage tandem queue with exponential production time at each stage, An emergency order skips the first stage for a fee.
### 073-1439  Forecasting Product Life Cycle Curves: Practical Approach and Empirical Analysis

Kejia Hu, Student, Northwestern University Kellogg School of Management, United States
Jason Acimovic, Assistant Professor, Penn State University University Park, United States
Doug Thomas, Professor, Penn State University University Park, United States
Jan van Mieghem, Northwestern University, United States

We present an approach to fit product life cycle (PLC) curves from historical customer order data and use them to forecast customer orders of ready-to-launch new products that are similar to past products. Our forecasts result in absolute errors approximately 9% lower than the company forecasts.

### 073-1238  Shelf-Space Management Under Merchandising Constraints and Stockout-Based Substitution: Case Study From a German Grocery Retailer

Dmitry Smirnov, Student, WHU Otto Beisheim School of Management, Germany
Arnd Huchzermeier, Professor, WHU Otto Beisheim School of Management, Germany

We extend the shelf-space allocation problem by including stockout-based substitution and use a competitive interaction framework to account for (cross-)space-elasticities. The proposed variable neighborhood search allows to incorporate merchandising constraints and solve the problem close to optimality. We test the solution at a pilot store of a German grocery retailer.

### 073-0288  SKU Classification Scheme and Impact on Store Inventory Accuracy

Rafay Ishfaq, Assistant Professor, Auburn University, United States
Uzma Raja, Associate Professor, University of Alabama Tuscaloosa, United States

A large transactional dataset comprised of 7,400 SKUs is analyzed to propose a SKU classification scheme based on items’ price, sales, popularity, replenishment cycle, inventory level, and IRI rates. Study evaluates the effectiveness of the classification scheme for cycle counting in a RFID-enabled retail store.

### 073-0165  The Roadside Healthcare Facility Location Problem

Harwin De Vries, Student, INSEAD, France
Joris Van de Klundert, Professor, Erasmus University Rotterdam, Netherlands
Albert Wagelmans, Professor, Erasmus University Rotterdam, Netherlands

We consider the problem to select locations for clinics along African highways, so as to maximize their impact in terms of truck driver patient volume and health service effectiveness. We develop models for this problem, present numerical experiments for road network in South-East Africa, and discuss policy implications.

### 073-0342  Effect of Information Sources on Fire Risk Reduction Behaviors

Huifang Jiao, Student, University of Science and Technology of China, China

Communicating risk information is crucial in policy making regarding hazardous events. The processes of information sources and risk mitigation guide individuals’ reactions to risk communication strategies and is considered in this study in the context of fire risk.

### 073-0837  Scaling Adoption of Hermetic Post-Harvest Storage Technologies in Uganda

Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
Mark Brennan, Student, Massachusetts Institute of Technology, United States
Emily Gooding, Student, Massachusetts Institute of Technology, United States

We present an approach to fit product life cycle (PLC) curves from historical customer order data and use them to forecast customer orders of ready-to-launch new products that are similar to past products. Our forecasts result in absolute errors approximately 9% lower than the company forecasts.
HONG REN, Associate Professor, uwm, United States

A Strategic Approach to Supplier Selection

Chair(s):

Session: Sunday, 01:15 PM - 02:45 PM, Grand K
Track: Optimization in Disaster Response Logistics
Chair(s): Gina Galindo

073-0937 Prepositioning Inventory for Disasters: A Robust and Equitable Model

german andres velasquez diaz, Student, North Carolina State University, United States
Maria Mayorga, Associate Professor, North Carolina State University, United States
eduardo Cruz, Student, Universidade Federal do Parana, Brazil

We address the inventory prepositioning problem, specifically determining suppliers, amount of prepositioned relief supplies and distribution centers to open in order to serve demand for relief supplies. The deterministic model and robust counterpart are solved optimally and with a proposed heuristic. Performance is evaluated and a case study is analyzed.

073-1325 Transportation of Hazardous Materials Under a Disaster Setting

Ruben Yie-Pinedo, Professor, Universidad del Norte, Colombia
Ana Milena Bedoya Vasquez, Student, Fundación Universidad del Norte, Colombia

This research focuses on the transport of hazardous materials, such as fuel, upon the occurrence of a disaster. The objective is to minimize the response and delivery times of hazardous materials required as part of the response and recovery activities of the disaster management, while minimizing the associated risk.

073-1047 Inter-Agency Facilities Location Model Under Infrastructure Disruption Probabilistic Scenarios: The Case on Bogotá-Colombia Earthquake

Leonardo González, Professor, Universidad De La Sabana, Colombia
Feizar Rueda, Assistant Professor, Universidad Nacional de Colombia, Universidad Distrital*Francisco José de Caldas, Colombia
Miguel Jaller, Assistant Professor, University of California Davis, United States

This paper proposes a mathematical formulation for the optimal location of aid distribution centers considering probabilistic infrastructure disruption scenarios that minimizes total response/service time to beneficiaries. The model considers inter-agencies decision and facility operations and geographical constraints, in order to locate aid in safety zones. Case of study: Bogotá, Colombia

073-0730 Integrating Road Network Restoration and Disaster Relief Operations

Juliette Garcia, Student, Universidad del Norte, Colombia
Gina Galindo, Assistant Professor, Universidad del Norte, Colombia

The collapse of road network segments is a hard consequence of disasters. It diminishes the accessibility to affected areas, delaying the execution of relief tasks. This research aims to coordinate road restoration tasks with disaster relief operations. The problem is solved by combining vehicle routing and machine scheduling methods

Stock Market Reaction to Recognition for Energy Efficiency

Mahdi Mahmoudzadeh, Student, Georgia Institute of Technology, United States
Vinod Singhal, Professor, Georgia Institute of Technology, United States

Energy efficiency is valued by governmental agencies, environmental sectors, and companies in a variety of industries. Using EPA’s Partner of the Year award as the proxy for recognition, we investigate how investors react to companies’ success in energy efficiency.

073-0919 When Does It Pay To Be Green? An Environmental Status Perspective

Chien-Ming Chen, Associate Professor, Nanyang Business School, Singapore
Dixon Ho, Assistant Professor, Nanyang Technological University, Singapore

This paper examines how customer environmental status moderates the relationship between a supplier’s environmental performance and financial performance. We hypothesize that a curvilinear relationship exists between corporate environmental performance and corporate financial performance and this relationship is moderated by customers’ environmental status.

073-1329 Developing a Water Risk Screening Methodology for Supply Chain Management

Torben Schaefer, MSc., -, Germany
Maximiliano Udenio, Assistant Professor, Technische Universiteit Eindhoven, Netherlands
Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

We assess the water risk associated with a manufacturing firm’s upstream supply chain. We identify physical and amplifying water risks, and use a Monte Carlo Analytic Hierarchy Process Methodology to aggregate and score the water risks associated to suppliers based on location.

Sunday, 01:15 PM - 02:45 PM, Regency B
Session: Supplier selection and sourcing
Track: Purchasing and Supply Management
Chair(s): Jishnu Hazra

073-1415 A Strategic Approach to Supplier Selection

Baichun Feng, Associate Professor, Webster University, United States
HONG REN, Associate Professor, uwm, United States
In this paper, we first propose and analyze a mathematical model for the supplier selection problem. Then a neural network is proposed to implement the model. A hidden layer is included in the neural network to capture the decision maker's highly nonlinear preference. Contribution is discussed.

**073-0610** How Supplier Scale and Scope Drive Supplier Selection Decisions

Florent Badorff, Student, Kuehne Logistics University, Germany
Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland
Kai Hoberg, Associate Professor, Kuehne Logistics University, Germany
Felix Papier, Associate Professor, ESSEC Business School, France

We investigate how suppliers' economies of scale and scope influence buyers' decisions in the automotive industry, and picture the influence contingent upon important economic-, buyer-, and relationship characteristics. Our research helps buying firms better understand their supplier selection decisions, and suppliers to increase the likelihood of winning business.

**073-1171** The Anchoring Bias in New Task Versus Modified Rebuy Purchasing Decisions

Wout van Wezel, Assistant Professor, University of Groningen, Netherlands
Nick Ziegen, Student, University of Groningen, Netherlands

The anchoring bias describes the tendency to rely too heavily on a single piece of information during decision making. We conducted a vignette-based experiment to investigate whether purchasing professionals are also subject to this bias, and whether the bias is different in new task versus modified rebuy decisions.

**073-0888** Strategic Sourcing and Process Improvements

Arman Basu, Associate Professor, Indian Institute of Management Bangalore, India
Taran Jinh, Assistant Professor, Indian Institute Of Management, Udaipur, India
Jishu Hazra, Professor, Indian Institute of Management Bangalore, India

We study a buyer's sourcing strategy when facing suppliers who reduce their unit costs through investments in process improvements. The buyer sources his requirement from these suppliers over two periods through a combination of guaranteed amount and bidding competition. We characterize the buyer's optimal procurement policy and suppliers' investments.

**073-0788** Sport Analytics Utilisation in the Sport Industry: A Literature Review

Benjamin Dehe, Senior Lecturer, University of Huddersfield, United Kingdom
David Bamford, Professor, University of Huddersfield, United Kingdom

This research aims to investigate the role of data analytics and technology in the sport industry. The research uses a structured literature review to establish what the current practices are and identify their utilization levels to inform decision-making within this industry. This study will contribute to cement the disjointed research.

**073-1368** Funding Allocation Schemes And Olympics Performance Of National Sports Team

Manfredi Brucoleri, Associate Professor, University of Palermo, Italy
Giovanni Perrone, Professor, Universita Degli Studi Di Palermo, Italy
Paolo Roma, Assistant Professor, Universita Degli Studi Di Palermo, Italy

In this paper we empirically analyze how the funding allocation schemes utilized by countries to fund sport federations and teams influences the performance of their teams in the Olympic games.

**073-1703** Sports Operations Management: The Whole Nine Yards

David Bamford, Professor, University of Huddersfield, United Kingdom
Benjamin Dehe, Senior Lecturer, University of Huddersfield, United Kingdom
Iain Reid, Senior Lecturer, University of Huddersfield, United Kingdom
Jim Bamford, Senior Lecturer, University of Huddersfield, United Kingdom
Marina Papalexi, Lecturer, University of Huddersfield, United Kingdom

We present the opportunity to engage in applying core Operations Management techniques within sports (the whole nine yards!) and will cover three areas: 1 - Past history; 2 - Present situation; 3 - Future projections and opportunities. We have purposefully avoided a single sport focus.

**073-0918** Using Bargaining-Game Model to Negotiate Compensation for the Early Termination of BOT Highway Projects

Lulu JIN, Student, Dalian University of Technology, China

This paper proposes an effective method to evaluate the compensation amount for projects with incomplete contracts using game theory. A bargaining-game model with complete information is constructed to analyse the process of negotiation. The Nash equilibrium solution is derived and a discussion of the properties of the solution is presented.

**073-1566** Notions of Quality in Public Administrative Theory

Gyula Vastag, Professor, Szechenyi Istvan University, Hungary
Andras Herczeg, Student, Corvinus University of Budapest, Hungary
Mate Toth, Senior Lawyer, FALUDI WOLF THEISS / Attorneys-at-Law, Hungary
The paper gives an overview of how the three pillars of administrative theory (law, management and political science) treat the notion of quality and discusses the theoretical and practical consequences of configurative cyclicity within a range of public administration configurations.

073-0469  Impacts of City Planning and Port Management in the Spatial Configuration Projects of Brazilian Ports
Murillo Caldeira, Student, Centro Universitario Da Fei, Brazil
Wilson Hilsdorf, Assistant Professor, Centro Universitario Da Fei, Brazil

This study shows the strategies adopted by Brazilian cities and port authorities in the expansion configuration of port activity associated with the old port area transformation in revitalized structures. International studies indicate that best practices in assertive decisions are obtained by port-city committees, recent institutions in the Brazilian port agenda.

073-1215  The Organized Ports Management and Protection of the Environment by the Municipal Action
Washington Luiz Soares, Student, UNISANTOS UNIVERSIDADE CATÓLICA D SANTOS, Brazil
Eliane Maria Martins, Professor, UNISANTOS, Brazil
Douglas Mateus, Student, UNISANTOS UNIVERSIDADE CATÓLICA D SANTOS, Brazil
Luciano Souza, Professor, UNISANTOS, Brazil

The article discusses the political circumstances and the environmental law to manage the soil environmental compliance of the city port, where sustainability standards depend on new public policies at the port where they will be required investments for infrastructure projects and tax incentives for sustainable transport of goods.

073-1739  Identifying Missing Values Occurrences in AVL Data from a Rural Transit System
Roger Solano, Associate Professor, Slippery Rock University, United States

This paper analyzes Automatic Vehicle Location (AVL) data from a rural transportation system. We analyze patterns in the missing values occurrence to identify data capture and recovery issues. We identified problems with the current system and provide recommendations to improve data capture and recovery.

073-0124  Production Process Moves and Functional Diversity
Petis Kent, Student, University of Minnesota, United States
Enno Siemsen, Professor, University of Wisconsin Madison, United States

To study ways in which firms can effectively transfer process knowledge during production moves, we develop a behavioral experimental design and we study the impact of between and within team functional diversity. We discuss our findings and their potential implications for a firm's operational strategy.

073-1025  Asset Optimization Through Integrated Operations
Denise Chenger, Assistant Professor, Mount Royal University, Canada

Integrated Operations (IO) relies on real-time decision making through situational awareness amongst team members designated to an IO centre. Getting this right can be a game changer for an organization. As collaboration of personnel is key for optimizing an IO, this study examines personnel traits as an organization's starting point.

073-0306  Project Team Members and Burnout: A Study of Behaviors in Operations Management
Stephanie Hughes, Student, University of Washington Bothell, United States
Deanna Kennedy, Assistant Professor, University of Washington Bothell, United States
Lisa Stickney, Associate Professor, University of Baltimore, United States

Project managers should be concerned about individual level burnout due to its spillover effects on teammates and its effects on project performance. We look at teams over time and how burnout relates to various team outputs. The results will provide signals to managers about the need for intervention.

073-0879  The Role of Team Leadership and Team Mental Models on Effective Care Coordination
Onyi Nwafor, Student, University of Houston, United States
Norm Johnson, Professor, University of Houston, United States

Multidisciplinary teams are critical to effective care coordination in healthcare. This study examines the relationship between team leadership, team mental models, and coordination in the healthcare context. Study implications for the design of effective care coordination teams are discussed.

073-1866  Effect of Nonuniform Temperature on Optimization of the Natural Gas Pipeline Transmission Problem
Tianhu Deng, Associate Professor, Department of Industrial Engineering, China
Junchi Ye, Student, Department of Industrial Engineering, China
Mengying Xue, Student, Department of Industrial Engineering, China

This paper focuses on studying the effect of nonuniform temperature on the natural gas pipeline transmission problem. The variation of gas temperature is proved to affect important physical parameters in gas transmission, which further affects the optimization results. Numerical results on real networks with nonuniform temperature are provided.

073-1883  Optimal Real-Time Wind Farm Operation Strategy Under Curtailment Demands Considering Expected Turbine Life-Time Energy Generation
Mu-Xia Sun, Student, CentraleSupélec, France
Yan-Fu Li, Professor, Tsinghua University, China
Zijun Zhang, Assistant Professor, City University of Hong Kong, Hong Kong
Wind farms are quickly built in China. However, wind power generation can be curtailed by grid regulator. We investigate the convexity of one wind turbine’s expected life-time energy generation to its real-time operation. A data-driven mathematical programming model is then proposed to optimize the real-time wind farm operations.

This paper focuses on managing the issues related to the integration of wind power in electricity networks by combining economic wind curtailment (EWC) and demand response (DR) for the daily unit commitment problem. Interactions of wind power with EWC and DR are analyzed both analytically and numerically.

The customization of conspicuous goods, where utility rises from displaying the product, allows consumers with a desire for uniqueness to create their own exclusivity. The firm determines: How much customization to offer? What should prices be for standard and custom goods? Is a monopolist better off with both product offerings?

We consider multi-period new product development (NPD). We show that selecting low risk low value projects every period implies counter-intuitively higher risk than selecting high risk projects every period. We show that this phenomenon is commonly present in NPD selection problems and develop a framework to overcome it.

In this article, we first analyze the relationship between business cycle and the performance of commercial bank with a PVAR Model. Then basing on the new normal economy, especially the internet finance rising, point out the opportunities and challenges of Commercial Bank. Finally provide several operation innovation plans for CB.

Managing the lifecycle of business models offers great strategic potentials for improving the competitive advantages. It helps to evaluate the necessity of business model innovations and portfolio balancing. This paper focuses on designing a lifecycle concept for business models and derives implications for business model innovations.
Fintechs, the name given to start-ups and traditional companies that use technology to make financial services more efficient and effective, has changed the global banking landscape in recent years. Many comments emphasized the new threat to established banking models. This article discusses this as an opportunity to develop new partnerships.

**073-1919 Modern Web APIs and Firms as Platforms: Potential and Challenges**
Bryan Kirschner, API Strategy at Google, United States

Modern APIs are both code and contracts offering the virtues of modularity and precise metering. Research using data from a leading corporate API platform provider shows a significant relationship between APIs and profitability. But management practices must evolve to achieve the full potential of “firm as platform” that APIs unlock.

Abhishek Roy, Student, McCombs School of Business, United States
Edward Anderson, Professor, University of Texas Austin, United States
Geoffrey Parker, Professor, Dartmouth College, United States

Platforms thrive when third-party developers or sellers succeed in attracting users. However, a platform may be adversely affected if one or a handful of third-party developer(s) become(s) extremely successful and dominate the platform. We examine strategies for the platform on which one or a few developer(s) dominate(s).

**073-1700 Pricing for Information in On-Demand Services**
Hemant Bhargava, Professor, University of California Davis, United States
Nabita Pemstata, Assistant Professor, University of Utah, United States

We examine the informational role of pricing by comparing per-unit and three-part tariffs in the context of an on-demand service that matches supply and demand by redistributing surplus across disconnected markets. We show that three-part tariffs can be more efficient in fulfilling demand when surplus across markets is highly dispersed.

**073-1948 Platforms: A Story of Operations Excellence?**
Hemant Bhargava, Professor, University of California Davis, United States

Platforms have generated huge excitement. Their prominence is largely attributed to network effects. This focus has highlighted unique business challenges and led to intellectual contributions. We argue for another vital aspect - operational excellence - a resource utilization architecture that leverages today's IT capabilities to achieve operational efficiency and advantage.

**073-0496 How To Select Your Next Robotized Warehouse?**
René De Koster, Professor, Erasmus University Rotterdam, Netherlands

The new generation of warehouses will be fully robotized. Managers can select from different competitive robotic techniques to fulfill the customer orders. We develop analytical performance models and use them to optimally size the systems for costs, throughput and response time, and for comparison between the most popular robotic techniques.

**073-0418 Integrated Scheduling and Transportation Decisions for Dual Demand Supply Chain Environment**
Can Celikbilek, Data Scientist, Operations Research, & Systems Engineering, United States
Gursel Suer, Professor, Ohio University, United States

This research proposes new mathematical models and various new heuristic approaches to design a comprehensive supply chain system in the presence of high-volume and low-volume vinyl windows demand in the state of Ohio. Stochastic cellular manufacturing design, scheduling and vehicle routing optimization decisions are performed.

**073-1534 A Transformed Equation for Fixed-Charge Transportation Problem**
Veena Adlakha, Professor, University of Baltimore, United States
Krzysztof Kowalski, Dept of Transportation, State of Connecticut, United States

In this paper, we show that the equation for the fixed-charge transportation problem (FCTP) can be shown in a different, transformed way. To our knowledge that is the first ever effort of altering the fixed charge equation besides previous efforts on "extracting" fixed and variable portions of the equation.

**073-0087 Pareto-Efficient Matching Mechanisms for Carrier Collaboration With Money Flow**
Yu Ning, Student, Shenzhen University, China
Su Xiu Xu, Assistant Professor, University of Hong Kong, Hong Kong
Jiasen Sun, Student, Soochow University, China
Rui Yang, Student, Soochow University, China

This is the first study to apply market design theory to the field of supply chain and logistics management. Since money flows do not occur in several types of matching markets, this study the potential of lane exchange among a number of self-interested truckload carriers in a collaboration network.
A retailer is pricing dynamically in order to maximize its expected cumulative revenue when facing strategic or myopic customers. He is applying a proposed Strategic Thompson Sampling algorithm to learn the expected demand. We show numerically and analytically that the retailer can be better off with strategic customers.

We study how the offering of premium seating upgrades affects the airline's ticket price dispersion. We provide insights into this effect both analytically and empirically.

We consider an online retailer's pricing and inventory management strategies, and examine their implications on the retailer's sales and profit.

We investigate how retailers design store brand products under different market characteristics, such as the intensity of competition, consumer heterogeneity, and the manufacturer's strategic decisions. We find that symmetric retailers have an incentive to decrease the product quality of their store brands as the competition among them gets more intense.

We consider a system in which a consumer can only buy a product but also rent one owned by the firm and charged by per-use. A model is developed to explore the optimal pricing and inventory management decisions for retailers when facing quality discrepancy.

How customers evaluate product quality is a central construct in management, but existing measures are inconsistent with its dimensional nature. We propose a second-order reflective-formative measurement model of product quality, validate it in six product categories, examine effects on loyalty and willingness to pay, and assess moderators of these effects.

50% Off or Buy One Get One Free are two common forms of sales promotion used by retailers. Many empirical papers study consumers' preferences between them, while retailers' best choice and pricing strategy remain unclear. A game-theoretic model is proposed to address these questions.
We examine a two-period game between an Original Equipment Manufacturer and his supplier during new product development. The supplier may detect specification problems during production. We first prove that it is strictly better for the OEM to design the contract so that the supplier will voluntarily point out specification

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<th>Session: Quantitative Research in Service Quality</th>
<th>Chair(s): Fariborz Partovi</th>
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<tr>
<td>Sunday, 01:15 PM - 02:45 PM, Juniper</td>
<td>Track: Service Operations</td>
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<tr>
<td>073-1086 Towards a Counterfeit-Proof Global Supply Chain</td>
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<tr>
<td>Xishu Li, Student, Rotterdam School of Management, Netherlands</td>
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<tr>
<td>Morteza Pourakbar, Assistant Professor, Rotterdam School of Management, Netherlands</td>
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<td>How can supply chain partners collaborate to mitigate the risk of counterfeit products entering the legitimate supply chains? Through a game-theoretic framework, we investigate the optimal strategies, such as investments in improving supply chain visibility, to combat counterfeit products and study strategic interactions between customers, OEMs and counterfeiters.</td>
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<td>Sunday, 01:15 PM - 02:45 PM, Juniper</td>
<td>Track: Service Operations</td>
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<tr>
<td>073-1634 Contract Design in Processing Trade</td>
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<tr>
<td>Paolo Letizia, Assistant Professor, University of Tennessee Knoxville, United States</td>
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<td>In processing trade companies can either control or delegate the quality provision for their products. The traditional framework of adverse selection would not confer any value to quality delegation, whereas most western companies delegate quality to Chinese producers. We introduce the concept of expertise asymmetry to cover this research gap.</td>
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<th>Session: Revenue Management and Pricing</th>
<th>Chair(s): Jiahua Wu</th>
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<tr>
<td>Sunday, 01:15 PM - 02:45 PM, Laurel</td>
<td>Track: Revenue Management and Pricing</td>
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<tr>
<td>073-0125 Optimization of Post-Sale Life Cycle’s Cost for Repairable Products Under Warranty and Preventive Maintenance</td>
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<tr>
<td>Azmat Ullah, Student, Antai College of Economics and Management, China</td>
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<tr>
<td>Wei Jiang, Professor, Shanghai Jiao Tong University, China</td>
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<td>Paper analyses the effects of safety cost on the post-sale life cycle cost for a repairable product purchased with a non-renewing free minimal repair warranty. Using a model and algorithm, we also determine how much effort of preventive maintenance actions is worthwhile for the buyer.</td>
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<tr>
<th>Session: Learning, Pricing and Crowdfunding</th>
<th>Chair(s): Jiahua Wu</th>
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<tr>
<td>Sunday, 01:15 PM - 02:45 PM, Laurel</td>
<td>Track: Revenue Management and Pricing</td>
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<td>073-0019 Goal Gradient in the Crowdfunding Industry</td>
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<tr>
<td>Dennis Zhang, Assistant Professor, Washington University St Louis, United States</td>
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<td>Hengchen Dai, Assistant Professor, Washington University in St. Louis, United States</td>
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<td>In this project, we empirically document the existence of goal gradient in an important social context: the crowdfunding platform. We provide causal evidence to differentiate three main mechanisms behind goal gradient phenomena in this context: herding, likelihood of success and social preference.</td>
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<tr>
<td>Sunday, 01:15 PM - 02:45 PM, Laurel</td>
<td>Track: Revenue Management and Pricing</td>
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<td>073-0049 Social Learning and the Design of New Experience Goods</td>
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<tr>
<td>Yiagos Papanastasiou, Assistant Professor, University of California Berkeley, United States</td>
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<td>This paper studies the implications of social learning for the design of new experience goods. The main finding is that social learning results in the production of goods whose quality is lower on average, as compared to those produced in the absence of social learning.</td>
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<td>073-1014 Multi-attribute Loss Aversion and Reference Dependence: Evidence from the Performing Arts Industry</td>
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<tr>
<td>Necati Tereyagolgu, Assistant Professor, Georgia Institute of Technology, United States</td>
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<tr>
<td>Peter Fader, Professor, University of Pennsylvania, United States</td>
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<td>Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States</td>
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<td>We hypothesize that not only the price but also the observed sales for a seating area determines a customer’s utility from buying a ticket for a show. Using customer level transaction data from an organization, we show that customer decisions are driven by reference effects on both prices and sales.</td>
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<td>Session</td>
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</table>
| Advances in outpatient scheduling and clinic capacity management | Healthcare Scheduling | Yichuan Ding | 073-0997 An Optimization Approach For Coordinating Clinic And Surgery Appointments To Meet Access Delay Service Levels | Esmaeil Keyvanshokooh, Student, University of Michigan - Ann Arbor, United States  
Mark van Oyen, Professor, University of Michigan Ann Arbor, United States  
Pooyan Kazemian, Student, Harvard University, United States |
| | | | Providing timely access to surgery is key for patients with high acuity diseases. We present an optimization approach for coordinating both clinic and surgery appointments to meet access delay service levels. Our method is applied to historical patient data for a real-case study to show its better performance. |
| Dynamic Appointment Scheduling of Elective Surgeries Under Bed Capacity Constraint | | Chengyu Wu, Student, Duke University Durham, United States  
Li Chen, Associate Professor, Cornell University, United States  
Jeanette Song, Professor, Duke University Durham, United States |
| | | We study the problem of scheduling elective surgeries that aims to provide patients with specific surgery dates at the time when they call in, taking into account the ICU capacity and occupancy. A heuristic is developed and then validated using real hospital data. |
| Optimization of Telemedicine Appointments in Rural Areas | | Ayca Erdogan, Assistant Professor, San Jose State University, United States  
Jennifer Lobo, Assistant Professor, University of Virginia, United States  
Tracey Krupski, Associate Professor, University of Virginia, United States |
| | | Telemedicine clinics can improve access to specialists in rural areas. We present a stochastic optimization model for scheduling telemedicine appointments for bladder cancer surveillance in rural Virginia considering uncertain procedure durations and patient no shows. Our model minimizes provider idle time and considers no-show rates dependent on travel time. |
| Prioritizing Returning Customers in an Appointment-Based Service System | | Yichuan Ding, Assistant Professor, University of British Columbia, Canada  
Diwakar Gupta, Professor, University of Minnesota, United States  
Xiaoxu Tang, Student, University of Minnesota, United States |
| | | We study the option of prioritizing returning customers in an appointment-based queue with the goal of maximizing service volume. Applications of this model include outpatient or dental appointment scheduling. We characterize the optimal policy in both an open-access and traditional appointment systems and derive insights for the system manager. |
| The Flipped Classroom of Operations Management: A Not-for-Cost-Reduction Platform | Teaching/Pedagogy in P/OM | Davis Alves | 073-1693 |
| | | Ardavan Asef-Vaziri, Associate Professor, California State University Northridge, United States |
| | | A flipped classroom is an online-course because all the lectures are delivered online. It is a traditional-course since all classes are in-session and are spent on more value-added activities. We reinforce this core concept by a network of resources and learning processes ensuring a smooth-lean-synchronized course delivery. |
| Strategies and Tactics in First-Time Teaching Online and Blended Courses | | Timothy Smunt, Professor, University of Wisconsin Milwaukee, United States |
| | | As a seasoned instructor of live operations management courses, over the past 12 months I designed and taught both 100% online and blended (hybrid) courses to undergraduate students. Lessons learned as well as strategies for slow conversions to a fully online pedagogy will be discussed. |
| Informal and Formal Relations Among Academics: Similarities and Differences Evaluated by Social Network Analysis | | Tais Andreoli, Student, USCS, Brazil  
Sandra Leonardo, Student, USCS, Brazil  
Ana Lima, Student, USCS, Brazil  
Milton Farina, Professor, USCS, Brazil  
Davis Alves, Student, USCS, Brazil |
| | | The objective of this study was to compare the social networks of personal friendship (informal) and professional collaboration (formal) of students who attends different undergraduate courses and semesters. The method adopted was an exploratory research based on the social network analysis with structural focus and its several measures. |
| Incentive and Gaming in Collaborative Projects under Risk Sharing Partnership | Inventory Management | Panos Kouvelis | 073-1859 Inventory and Quotation Management for Project Supply Chains with Modularization |
| | | Ju Myung (J.M.) Song, Student, Rutgers Business School, United States  
Yao Zhao, Professor, Rutgers University, United States |
| | | Collaboration and partnership are essential for development projects many industries. We develop game theoretical models to show how firms behave on behalf of their best interest in collaboration and how it affects the project performance under information asymmetry. |
Shi Chen, Assistant Professor, University of Washington, United States
Kamran Moinzadeh, Professor, University of Washington, United States

We study a supply chain with suppliers of certain high-value modules and a manufacturer who assembles final products using the modules. The contractor provides delivery time quotes to potential customers. We consider a uniform quotation policy versus an adaptive quotation policy, when the suppliers implement independent or modified base-stock policies.

073-0926  Capacity Investment Under Cost Sharing Contracts
Feifei Shan, Student, University of Science and Technology of China, China
Feng Yang, Associate Professor, University of Science and Technology of China, China
Minyue Jin, Student, University of Science and Technology of China, China

This paper investigates the role of a retailer in a manufacturer’s capacity investment strategies. Two capacity sharing contracts are introduced: one with a threshold but another not. We discuss and compare the optimal decisions of the two contracts in the paper.

073-1868  Project-Based Supply Chain: Inventory and Pareto Analysis of Wholesale Price Contract
Xingxing Chen, Student, Washington University St Louis, United States
Panos Kouvelis, Professor, Washington University, United States
Yu Xia, Associate Professor, Northeastern University, United States

We study the inventory decisions in a two-stage supply chain where the downstream firm’s object function includes an additional penalty term due to late completion of a project. We find the optimal inventory decisions and conduct Pareto efficient analysis for simple wholesale price contracts of different inventory ownership terms.
### Session: HealthCare Operations Management
#### 419 Sunday, 03:00 PM - 04:30 PM, Evergreen A
**Track:** Healthcare Operations Management
**Chair(s):** Soroush Saghafian

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<tr>
<th>073-0821</th>
<th>Jumping the Line, Charitably: Analysis and Remedy of Donor-Priority Rule</th>
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<tr>
<td>Tinglong Dai, Assistant Professor, Johns Hopkins University, United States</td>
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<td>Ronghui Zheng, Assistant Professor, University of Texas Austin, United States</td>
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<td>Katia Sycara, Professor, Carnegie Mellon University, United States</td>
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The ongoing shortage of organs for transplantation has generated an expanding literature on organ allocation. By contrast, organ donation has been little explored. In this paper, we develop a parsimonious model of organ donation to analyze the donor-priority rule, which grants registered organ donors priority in receiving organs.

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<tr>
<th>073-1020</th>
<th>Impact of Medicare’s Guidelines on the Opioid Epidemic</th>
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<tbody>
<tr>
<td>Alireza Boloori, Student, Arizona State University Tempe, United States</td>
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<tr>
<td>Soroush Saghafian, Assistant Professor, Harvard University, United States</td>
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Hospital EDs are in part responsible for opioid overprescription (as the main reason for the opioid epidemic). This is because of Medicare’s HCAHPS survey system, which prompts physicians to prescribe more opioids. We develop a principal-agent framework to analyze this problem and provide further insights for policy makers.

<table>
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<tr>
<th>073-1024</th>
<th>Reference Pricing for Healthcare Services</th>
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<tbody>
<tr>
<td>Shima Nassir, Student, University of Washington/ Business Schoo, United States</td>
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<tr>
<td>Elodie Adida, Associate Professor, University of California Riverside, United States</td>
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<tr>
<td>Hamed Mamani, Associate Professor, University of Washington, United States</td>
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The traditional healthcare payment system does not incentivize hospitals to limit their prices. Reference pricing (RP) has been proposed as a way to better align incentives. Under RP, patients may be responsible for part of the cost if they select a high-price hospital. We propose a model to analyze RP.

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<tr>
<th>073-0854</th>
<th>Hospital-Patient Alignment in Healthcare Systems</th>
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<tbody>
<tr>
<td>Soroush Saghafian, Assistant Professor, Harvard University, United States</td>
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<tr>
<td>Wallace Hopp, Professor, University of Michigan Ann Arbor, United States</td>
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Ensuring that patients are seen by the most appropriate hospitals is a central problem in healthcare systems. Lack of alignment between patient choices and hospital capabilities can create inefficiencies and prevent from achieving the best possible outcomes. We study policies that can be enforced to achieve higher levels of alignment.

### Session: DEA and Pricing in Healthcare
#### 420 Sunday, 03:00 PM - 04:30 PM, Evergreen B
**Track:** Healthcare Operations Management
**Chair(s):** C. Christopher Lee

<table>
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<tr>
<th>073-0931</th>
<th>Service Investment and Pricing Strategies of a Pharmaceutical Two-Sided Platform</th>
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<tbody>
<tr>
<td>Jianbin Li, Professor, Huazhong University of Science &amp; Technology, China</td>
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<tr>
<td>Tai Zhou, Student, Huazhong University of Science &amp; Technology, China</td>
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<tr>
<td>Bin Dai, Associate Professor, Wuhan University, China</td>
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We investigate service investment and pricing strategies of a pharmaceutical two-sided platform where doctors provide diagnostic service and platform sells drugs for patients, and find that the optimal service investment and pricing strategies for both doctors and drugs under various situations in terms of drug market size and diagnostic price.

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<tr>
<th>073-0925</th>
<th>E-tailer Competition in Pharmaceutical Supply Chain: Pricing Strategies and Formulary Design in China</th>
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<tbody>
<tr>
<td>Xueyuan Cai, Student, Huazhong University of Science &amp; Technology, China</td>
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<tr>
<td>Bin Dai, Associate Professor, Wuhan University, China</td>
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<tr>
<td>Jianbin Li, Professor, Huazhong University of Science &amp; Technology, China</td>
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We study pricing strategies of competitive pharmaceutical e-tailers under medical insurance, and investigate the formulary design of drugs by government-run health care institution considering online drug sales, and show the effects of pharmaceutical e-tailers’ entry on formulary design of drugs and social welfare.

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<tr>
<th>073-0066</th>
<th>Performance Evaluation of Mexico’s Public Health Care System: A DEA Window Analysis</th>
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<tbody>
<tr>
<td>Victor Pimentel, Assistant Professor, Mr., United States</td>
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<tr>
<td>Xun Xu, Assistant Professor, California State University Stanislaus, United States</td>
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<tr>
<td>Phillip Witt, Assistant Professor, University of Nebraska At Omaha, United States</td>
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Although research measuring technical efficiency as it relates to hospital performance has been present across the literature for several years, little is known about the performance of hospitals in Mexico. This paper aims to apply the Window Data Envelopment Analysis method to measure the efficiencies of hospitals in Mexico.

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<tr>
<th>073-1694</th>
<th>Do Nurse Practitioners Matter in Hospital Performance? A Data Envelopment Analysis Model</th>
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<tr>
<td>C. Christopher Lee, Associate Professor, Central Connecticut State University, United States</td>
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<tr>
<td>David Hwang, Assistant Professor, Shippensburg University, United States</td>
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<tr>
<td>Pauline Hwang, Student, Penn State University State College, United States</td>
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<tr>
<td>Yong-Taek Min, Assistant Professor, Florida Gulf Coast University, United States</td>
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<tr>
<td>Seung-Jin Ryu, Assistant Professor, Nagoya University of Commerce &amp; Business, Japan</td>
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This study investigates impacts of nurse practitioners on the hospital performance. A hospital’s relative efficiency score serves as a proxy for the performance measure, which is determined by a data envelopment analysis model. This research hypothesizes that if hospitals employ more nurse practitioners, then they become more efficient.
We analyze under what conditions the voluntary-based bundled payment programs (such as the BPCI initiative) become profitable for majority of healthcare providers. We aim to suggest alternative approaches that mitigate high drop-out rate of current system.

We develop procedures based on an optimization model and a heuristic to devise daily schedules for elective patients with deterministic surgery time. Then, we develop rescheduling procedures for the scheduled patients impacted by the arrival of an emergency patient and extend the analysis to stochastic surgery times for elective patients.

We consider a variant of the well-known appointment scheduling problem in which surgeries are allowed to start earlier than scheduled but idling of resources is not allowed. We show that the Smallest-Variance-First rule is optimal under the assumption of dilation ordering of the duration of the surgeries.

We study outpatient appointment block scheduling policies for single providers under conditions of patient heterogeneity in service times and patient no-shows.

Study looks at the impact of geographical manufacturing location risks a firm faces and 3 resilience indicators on firm performance. The study uses a unique cross sectional data set including 300 publicly traded firms and over 3,000 manufacturing locations. Findings indicate that resilience has a positive impact on performance.

We use one online tool to manage all aspects of the supply chain ramp readiness from equipment, to materials, to supplier readiness for our ramping products. We use Business Intelligence reporting to identify issues and roll up all segments of our data together to get the entire supply chain picture.

We examine whether combinations of vertical and horizontal integration strategies effectively mitigate supply chain risks and how they influence firm performance. Considering the demand- and supply-side challenges facing the maritime industry, we investigate these research questions by gathering and analyzing archival data from ocean liners.
On Models for the Planning and Scheduling of Operation Theaters: A Review of Literature

Rohit Titiyal, Student, Indian Institute of Technology Kharagpur, India
Kalyan Kumar Guin, Professor, Indian Institute of Technology Kharagpur, India

The objective of this review paper is to provide the comprehensive literature on operation theater room planning and scheduling with the classification of methodologies used, problem formulation and modeling consideration. The Contribution of this paper is future research direction to elaborating more knowledge and differentiating between the theory and implementation.

Predictive Analytics for Operational Failures in Medical and Healthcare Systems

Keivan Sadeghzadeh, Lecturer, Massachusetts Institute of Technology, United States

Despite the necessary improvements, medical and healthcare systems still struggle to address operational failure issues. The objectives are to design novel models for the prediction of failure time, by making use of complex and large-scale datasets to analyze causes and effects of failures, as well as to improve decision-making.

Development of Neutrosophic Analytic Hierarchy Process: Application to a Healthcare Problem

Irem Otyar, Assistant Professor, Okan University, Turkey
Cengiz Kahraman, Professor, Istanbul Teknik University, Turkey

We develop a novel Analytic Hierarchy Process (AHP) under uncertainty and apply it to a healthcare problem. This uncertainty is handled by neutrosophic sets measuring uncertainty based on three concepts: Truth, Indeterminancy and Falcity. Neutrosophic AHP enables decision makers to take into account their hesitancy in defining a membership function.

Directed Sourcing under Goal Incongruence: An Multi-Task Model of Triad

Yang Yang, Assistant Professor, University of Texas at El Paso, United States
Rui Yin, Associate Professor, Arizona State University Tempe, United States
Thomas Choi, Professor, Arizona State University Tempe, United States

We consider “directed sourcing”, an emerging practice in which buying companies directly source from second-tier suppliers, and formulate a multi-task principal-agent model to investigate the benefits (or the lack of) of directed sourcing structure to the OEM, top-tier supplier, and second-tier supplier under different levels of goal incongruence.

Design of a Mathematical Framework for Supplier-Based Revenue Sharing Coordination Policy under Inventory-dependent Demand Rate

Kumar Rohit, Student, Indian Institute of Technology Kharagpur, India
Sujoy Bhattacharya, Associate Professor, Indian Institute of Technology Kharagpur, India
Kalyan Guin, Professor, Indian Institute of Technology Kharagpur, India
Kunal Ghosh, Professor, Indian Institute of Technology Kharagpur, India

This paper addresses the mathematical design and formulation of profit-sharing mechanism for supplier-based revenue sharing contract for the goods experiencing inventory-dependent demand, and compares this with the non-coordinated case between the supply chain partners. The insights will develop a framework for an optimal ordering policy.

Supply Chain Competition With Strategic Supplier Collaboration

Zuqiang Liu, Associate Professor, Penn State Hazleton, United States
Jia Wang, Associate Professor, Rowan University, United States

We develop a modeling framework that studies competing supply chain firms who can strategically invest in suppliers. The firms can collaborate with strategic suppliers to develop new products. We model the decision-making process of each firm as an optimization problem and study the equilibrium of all competing firms.

CRM Implementation as a Competitive Strategy of a Metalworking Company: A Case Study

Jose Martino Neto, Professor, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
José Neves, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil
José Campanele, Professor, IFSP - Instituto Federal de São Paulo, Brazil
Marcelo Paranzini, Student, CEETEPS, Brazil

The research aims to describe the implementation of CRM (Customer Relationship Management) in a metal mechanics company, as a strategy of competitiveness. It analyzes the costs involved in the operations and describes the main advantages and disadvantages of the company in the application of CRM as a competitive differential.
Building flexible production networks is crucial in a volatile business environment. Local content requirements influence network structure, capacity investments, and needed flexibility. This paper proposes a stochastic programming model for the design of global production networks with local content requirements under demand and exchange rate uncertainty.

073-0335 Sustainable Supplier Responsibility: Global Consequences of the Initiative in Mobile Phone Market
Haruo H. Horaguchi, Professor, Hosei University, Japan
Apple disclosed its suppliers list since 2013 because one of the suppliers, Foxconn, had a history of suicides at its factories. A field research on a Japanese supplier to Apple is conducted to trace the concept of supplier responsibility. It had a higher standard as an automobile parts supplier.

073-0906 Using a Volatility Portfolio to Improve Supply-Chain Performance
Lauri Saarinen, Student, Universite De Lausanne, Switzerland
Katarina Kemppainen, Professor, Aalto University, Finland
Suzanne de Treville, Professor, Universite De Lausanne, Switzerland
Dedicating a local production facility to time-sensitive products (high demand volatility and low residual value after the demand period) risks loss of responsiveness due to excessive capacity utilization. We illustrate the value of producing a “volatility portfolio” locally using two manufacturing examples. We uncover performance potential and implementation issues.

073-1599 Digital Transformation of Logistics and SCM in Germany - A Cross-Country Empirical Analysis
Wolfgang Kersten, Professor, Hamburg University of Technology, Germany
Niels Hackius, Student, Hamburg University of Technology, Germany
Birgit von See, Student, Hamburg University of Technology, Germany
Digitalization is a mega trend that impacts logistics and supply chain management. Our empirical study with more than 300 participants highlights the current state of the digital transformation in logistics and SCM. Changes of technologies, value chains, business models, and skill requirements have been focused to derive recommendations for companies.

433 Sunday, 03:00 PM - 04:30 PM, Grand I
Session: Retail Formats and Product Variety
Chair(s): José Roberto Lyra
Track: Retail Operations Management

073-0725 Assortment Effects in the Scalability of Online Grocery Retail Platforms
Eliot Rabovich, Professor, Arizona State University Tempe, United States
Timothy Richards, Professor, Arizona State University Tempe, United States
Min Choi, Assistant Professor, California State University, United States
Lina Wang, Student, Arizona State University, United States
We use data from an online grocery retail platform to evaluate different assortment effects on the scale of the platform. We also evaluate unique challenges in planning optimal assortments in the platform, including product substitutability and the availability of inventory owned and held by vendors participating in the platform.

073-1360 Examining the Effects of Product Categories on Consumers’ Spending in Multiple Retail Formats
Qin Zhang, Assistant Professor, Pacific Lutheran University, United States
We propose a multivariate Tobit model to examine the effects of different products on consumers’ spending in multiple retail formats. The model also allows us to analyze complementary or substitution relationships among different retail formats. We estimate this model using panel data on consumer basket purchases across retail formats.

073-0728 Quantifying Transaction Costs in Omnichannel Grocery Retailing
Eliot Rabovich, Professor, Arizona State University Tempe, United States
Rui Sousa, Professor, Universidade Catolica Portuguesa, Portugal
Sungho Park, Associate Professor, Arizona State University Tempe, United States
Households incur a variety of transaction costs when choosing between picking up an online order at a store or having that order delivered to their homes. We examine these transactions costs and obtain monetary valuations using data obtained through a quasi natural experiment performed in collaboration with a grocery retailer.

073-1376 Retail Supply Chain at Omnichannel Era: Facing the Challenges
José Roberto Lyra, Student, Centro Paula Souza, Brazil
Olivia Amaral, Student, Centro Paula Souza, Brazil
Murilo Stankevic, Student, CEEEPs, Brazil
Eliane Simoes, Professor, CEEEPS, Brazil
Getulio Akabane, Retired, CEEEPS, Brazil
The omi-channel is part of any strategy for retailers growth then the importance of a solid back office in order to support the new demands is the key success factor. Thus the research aims to present the Brazilian big players experience supported by literature review and specific documents analysis.

434 Sunday, 03:00 PM - 04:30 PM, Grand J
Session: Emergency Logistics and Operational Preparedness for Weather-Related Disasters - 2
Chair(s): Gyöngyi Kovács Peter Tatham
Track: Humanitarian Operations and Crisis Management

073-1431 Snowmaggedon: The Logistics of Extreme Snowfall Events
Natalie Simpson, Associate Professor, SUNY at Buffalo, United States
Zhasmima Tacheva, Student, SUNY at Buffalo, United States
Climate change is credited with an increase in extreme snowfall events, or rapid accumulations that trigger building collapse and complete loss of ground transportation for extended periods. We document the response to one such event, which underscores society’s growing dependency on ground logistics for immediate survival.
073-1326  A Study of Factors Affecting Preparedness for Weather-Related Disasters  
Paul Larson, Professor, University of Manitoba, Canada  
This piece identifies and discusses several factors that may facilitate (or hinder) logistics and operations preparedness -- along with their link to the severity of weather-related disasters. Data are gathered largely from secondary sources, and analyzed using regression techniques.

073-0286  Disaster Logistics Preparedness for Seasonal Weather Extremes  
Minchul Sohn, Student, HUMLOG Institute, Finland  
Gyöngyi Kovács, Professor, HUMLOG Institute, Finland  
Disaster logistics preparedness for seasonal weather extremes is a routine process that occurs recurrently and temporally. We identify the routine dynamics of disaster logistics preparedness by investigating how actors make related decisions in consideration to climate and climate information.

073-0005  Hybrid Cargo Airships: How They Might Change the Response to a Rapid Onset Disaster  
Peter Tatham, Professor, Griffith University, Australia  
Craig Neal, Student, University of New South Wales, Australia  
Yong Wu, Senior Lecturer, Griffith University, Australia  
Hybrid Cargo Airships which have the potential to convey large payloads over significant distances with a relatively low cost/ carbon footprint are currently being trialed. Through consideration of three recent events, this conceptual research demonstrates how such HCAs could be used to improve the logistic response to a rapid onset disaster.

073-0488  Decision Support Framework for Humanitarian Relief Stockpiles: The Case of West Sumatra  
Giuseppe Timperio, Lecturer, National University of Singapore, Singapore  
Rika Hadiguna, Assistant Professor, Andalas University, Indonesia  
Avinash Samvedi, Lecturer, National University of Singapore, Singapore  
Robert De Souza, Professor, National University of Singapore, Singapore  
Insanull Kam, Associate Professor, Andalas University, Indonesia  
This paper provides a decision support framework to preposition humanitarian relief stockpiles for the real life case of West Sumatra. A novel methodology integrating GIS and fuzzy AHP, with four layer hierarchical structure, is used. Decision making criteria and sub-criteria consider stakeholders requirements and blue print of economics zones.

073-0580  A Scenario Robust Optimization Model to Stockpile Strategic Relief Supplies for Natural Disasters  
Xinfang Wang, Associate Professor, Georgia Southern University, United States  
Muer Yang, Assistant Professor, University of St. Thomas, United States  
Michael Fry, Professor, University of Cincinnati, United States  
Stockpiling relief supplies at strategic facility locations is critical for disaster preparedness planning. Robust stockpiling plans are in urgent need due to the inherent uncertainty in humanitarian logistics. This paper develops and illustrates a scenario robust optimization model in a realist case study of hurricane preparedness in the southeastern US.

073-1479  A Framework of Strategies for Delivering Effective Response to Disasters  
Amir Karimi, Student, University of Minnesota, United States  
Karthik V. Natarajan, Assistant Professor, University of Minnesota, United States  
Kingshuk Sinha, Professor, University of Minnesota, United States  
Humanitarian organizations pre-position supplies in proximity to disaster-prone areas enabling rapid redistribution in the event of a disaster. We develop strategies that focus on increasing the effectiveness of pre-positioning practices.

073-1699  Blood Inventory Management During Disaster Response  
Gina Dumkrieger, Student, Arizona State University Tempe, United States  
In the event of a disaster blood inventories can see substantial increases in demand with potential delays in restocking. Through the use of optimal allocation policy utilization of limited blood inventory can be improved, allowing more time for restocking. The same policies reduce outdated under normal operations.

073-0578  The Role of Social Planner in Closed-Loop Supply Chain  
Lan Wang, Assistant Professor, California State University East Bay, United States  
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States  
Asos Vakharia, Professor, University of Florida, United States  
Motivated by current observations, we study two diametrically opposed legislative practices for regulating and financing e-waste disposal. The two legislative practices are evaluated in the context of multiple stake-holder objectives: product prices; OEM profits; and consumer and environmental surplus.

073-0588  Pollution Regulation and Market Structure: An Operations Perspective  
Krishnan Anand, Associate Professor, University of Utah, United States  
Francois Giraud-Carrier, Assistant Professor, University of Illinois at Springfield, United States  
We model two popular regulations— Cap-and-Trade and Taxes— under imperfect competition, and prove that well-chosen regulation can simultaneously improve firms’ profits, consumer surplus and welfare. Further, firms can be induced to perfectly internalize their pollution externalities, without being charged a penny in taxes.
In many industries, there is growing recognition of the importance of tracking and documenting the environmental impact associated with goods and services offered through global supply chains. While this is a laudable goal, the challenges are not fully understood. We discuss some challenges and consider how they might be addressed.

The research is about the process of brazilian multimodality that became a neo-liberal exploitation of port cost unsustainable appointed by brazilian companies. The maritime laws were investigated to suggest innovations as ecoefficiency system in environmental compliance which could be proposed by Brazilian authorities.

This research develops and tests a benchmarking framework to robustly assess and quantify sport infrastructure and their operations. This will provide a major contribution to the field and influence the drivers for Stadium Management which is critical due to the complex nature of Sporting Venues and operational capability.

Anecdotal evidence suggests that trade plays an important role in the diffusion of managerial practices. Developed countries are an important destination for developing country exports. We analyze how trade with developed countries motivates firms in developing countries to adopt sustainable practices. Our findings suggest trade linkages promote sustainability.
We examine the moderating role of business strategy and operational slack on the relationship between service disruptions and service quality in the US airline industry. Our findings suggest that, while disruptions have a significant impact on service quality, the effect is more pronounced for more diversified airlines.

<table>
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<tr>
<th>Session:</th>
<th>Assessing the Bundling Effect in Plant-Level Operations Practices</th>
<th>Track:</th>
<th>Energy and Natural Resources</th>
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<tr>
<td>Chair(s):</td>
<td>Sarah Wu, Associate Professor, Fordham University, United States</td>
<td>Track:</td>
<td>Sehwon Kang</td>
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<td>Barbara Flynn, Professor, Indiana University, United States</td>
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<td>University of Minnesota, United States</td>
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<td>Steve Melnyk, Professor, Michigan State University, United States</td>
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<td>United States</td>
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The synergistic bundling effect has been argued among lean manufacturing practices in the sense that each of lean practices contribute significantly to higher operational performance. The study, following this theoretical framework, proposed an alternative approach to measure the potential bundling effects of plant-level practices on operations performance.

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<tr>
<td>Chair(s):</td>
<td>Shaunak Babadghao, Assistant Professor, Technische Universiteit Eindhoven, Netherlands</td>
<td>Track:</td>
<td>Kenneth Schultz</td>
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<td>Maximiliano Udenio, Assistant Professor, Technische Universiteit Eindhoven, Netherlands</td>
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Aggressive cash conversion cycle strategies can improve performance, but harm supply chain partners. We study the effect of a change in the CCC of a firm on their supply chain partners, both in terms of impact on their CCC as well as their profitability. We derive general insights and recommendations.

<table>
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<tr>
<th>Session:</th>
<th>Experimental Investigation on Effect of Stress on Decision Making in OM Setting</th>
<th>Track:</th>
<th>Operations Management</th>
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<tr>
<td>Chair(s):</td>
<td>George Kurian, Student, University of Texas Arlington, United States</td>
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<td>George Kurian, Student, University of Texas Arlington, United States</td>
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This study takes a look into the effect of time stress and social stress on decision making (inventory management) in a controlled lab setting. The results can provide insights into decision making at an individual level.

<table>
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<tr>
<th>Session:</th>
<th>Judgmental Adjustment of Quantitative Forecasts</th>
<th>Track:</th>
<th>Operations Management</th>
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<tr>
<td>Chair(s):</td>
<td>Santiago Forero, Student, University of Houston, United States</td>
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<td>Arunachalam Narayanan, Assistant Professor, University of Houston, United States</td>
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In spite of companies having access to sophisticated quantitative forecasting techniques, empirical research indicates that majority use some form of judgement to make the final forecast. Thus there is a need to understand how decision maker adjusts these quantitative forecasts, and we investigate this through a laboratory experiment.

<table>
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<tr>
<th>Session:</th>
<th>Antecedents to Fuel Efficiency</th>
<th>Track:</th>
<th>Operations Management</th>
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<tr>
<td>Chair(s):</td>
<td>James Cotton, Student, Air Force Institute of Technology, United States</td>
<td>Track:</td>
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<td>Kenneth Schultz, Professor, Air Force Institute of Technology, United States</td>
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Certain USAF airlift pilots use less fuel than others, even controlling for variables such as cargo, aircraft, and weather. We employ the Theory of Planned Behavior and a survey instrument to evaluate potential antecedents to fuel-efficient behavior such as attitudes, beliefs, perceived impact, and social pressure.

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<td>Chair(s):</td>
<td>Sehwon Kang</td>
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Taiwan government has been initiated the energy policy of nuclear-free homeland after Fukushima disaster. Power supply development is influenced by energy prices and policies. System dynamics methodology is used to simulate that accumulation of generation capacity from different energy sources. The policy effect is evaluated under alternative scenarios.

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<td>Chair(s):</td>
<td>Iłka DeLuque, Student, George Washington University, United States</td>
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<td>Iłka DeLuque, Student, George Washington University, United States</td>
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We apply optimal control theory with uncertainties in the magnitude and timing of two market-based environmental policies to determine the optimal allocation of R&D investments on fossil-fueled electricity generation technologies such as coal and gas versus non-fossil technologies such as solar, wind, geothermal, and biomass.

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<tr>
<th>Session:</th>
<th>Are Inspections Effective? The Differing Roles of Self-Inspections and External Inspections</th>
<th>Track:</th>
<th>Operations Management</th>
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<tr>
<td>Chair(s):</td>
<td>Sehwon Kang, Student, University of Minnesota, United States</td>
<td>Track:</td>
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<td></td>
<td>Rachna Shah, Associate Professor, University of Minnesota, United States</td>
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</table>

We study the differing roles of self-inspections and external inspections. We apply optimal control theory with uncertainties in the magnitude and timing of two market-based environmental policies to determine the optimal allocation of R&D investments on fossil-fueled electricity generation technologies such as coal and gas versus non-fossil technologies such as solar, wind, geothermal, and biomass.
Operators and government agencies in pipeline industry have striven to reduce incidents through inspections: self-inspections by operators and external inspections by government agencies. Using econometric analysis with data sets from over 1,500 pipeline operators, this study examines the differing roles of self-inspections and external inspections on future incidents.

**442**  
**Session:** NPD Process Improvement  
**Chair(s):** Zhaowei Hao  
**073-0543** Social Media and NPD Performance  
Debasish Mallick, Professor, University of St. Thomas, United States  
Use of social media is becoming increasingly popular in new product development (NPD). Yet, the performance impact of social media use in NPD remains inconclusive. Using a cross-industry survey of new product development projects, we explore the factors affecting the relationship between social media use and NPD performance.

**073-1191** Optimal R&D And Pricing Decision in the Presence of Advance Selling Strategy  
Haomin Li, Student, Peking University, China  
Shuxiao Sun, Student, Peking University, China  
R&D investment can increase consumers’ willingness to pay or the potential market size, and advance selling strategy is common used by firms to attract consumers and recover capital. This paper constructs a game-theoretic model to find out firm’s optimal R&D and pricing decision in the presence of advance selling strategy.

**073-1069** Analysis of Time, Cost and Quality Tradeoffs in New Product Development Decision-Making  
Je bum Pyun, Lecturer, So ok myung Women’S University, Korea, Republic of (South Korea)  
DaeSoo Kim, Professor, Korea University, Korea, Republic of (South Korea)  
This study analyzes previously unexplored complex development time, cost (associated with R&D resource input and indirect components) and performance quality tradeoffs involving U-shaped function in new product development decision-making. We solve this nonlinear model optimally and conduct extensive sensitivity analyses of decision variables and key parameters to provide managerial insights.

**073-2014** Innovation Uncertainty, New Product Press Timing and Strategic Consumers  
Zhaowei Hao, Student, Peking University, China  
We develop a framework where a high-tech firm sequentially introduces new products over two selling seasons in the presence of strategic consumers, to address the firm’s optimal stocking and pricing decisions, and investigate how innovation level, innovation uncertainty, new product press timing impact the firm’s operations strategy and profits.

**443**  
**Session:** Collaboration and Innovation  
**Chair(s):** Nikhil Mehta  
**073-2064** A Study on the Military Application of Commercial Drone  
Ha-Gyo Jung, Research Fellow, Korea Institute for Defense Analyses, Korea, Republic of (South Korea)  
Dennis Hong, Professor, University of Southern California, United States  
The objective of this paper is to examine the military application of commercial drone. Based on the model presented in the Impact of Drone Business, commercial drones were classified by autonomous flight ability and information gathering ability, and then military application field was suggested with the operation area of UAV.

**073-1362** Managing Information Security Investment with Mutual Information Sharing  
Yueran Zhuo, Student, University of Massachusetts Amherst, United States  
Senay Solak, Assistant Professor, University of Massachusetts Amherst, United States  
In information system security practice, the optimal policy of technology investments and information sharing largely depends on the interplay between these two operational decisions. We model such interplay with the uncertainty involved, and present the results on the value of sharing security information within and across industries.

**073-0755** Industry and Country Effects on NPD Practices and Performance  
So hel Ahmad, Professor, St.Cloud State University, United States  
Debasish Mallick, Professor, University of St. Thomas, United States  
Janine Sanders Jones, Associate Professor, University of St. Thomas, United States  
We use a survey of 310 new product development projects across three industries and ten countries to explore if NPD practices differ across industries and countries, and if NPD performance is affected by these differences in practices.

**073-1568** Competition, Collaboration, or Both: The Sweet Spot of Innovation Strategy for Virtual Teams  
Nikhil Mehta, Assistant Professor, University of North Carolina Greensboro, United States  
Indira Dasanayake, Assistant Professor, University of North Carolina Greensboro, United States  
Vasyl Taras, Associate Professor, University of North Carolina Greensboro, United States  
Prashant Palvia, Professor, University of North Carolina Greensboro, United States  
We investigate how innovation-related outcomes of global virtual teams solving complex business problems are influenced by inter-team competition and collaboration strategies. Specifically, we compare and contrast the innovativeness of solution (uniqueness, originality, impact) generated across three groups of global virtual teams: competing teams, collaborating teams, and hybrid -(cooperation) teams.
### Sunday, 03:00 PM - 04:30 PM

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<th>Room</th>
<th>Chair(s)</th>
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<td>Sunday, 03:00 PM - 04:30 PM, Balsam</td>
<td>Ling Xue</td>
<td>Analytics and Supply Chains</td>
<td>Information in Operations Management</td>
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<td>073-1567</td>
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<td>Willard Price, Emeritus Professor, University of Pacific, United States</td>
<td>Critical Insights about Data Analytics</td>
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<td>073-1541</td>
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<td>Shubin Xu, Assistant Professor, Northeastern Illinois Univ, United States, Yue Fang, Associate Professor, University of Oregon, United States</td>
<td>Value of Information Sharing in Supply Chains</td>
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<td>073-1513</td>
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<td>Anuragini Shrish, Assistant Professor, Telecom Ecole de Management (Institut Mines Telecom), France, Shalini Chandra, Assistant Professor, S P Jain School of Global Management, Singapore, Shirish C. Srivastava, Associate Professor, HEC Paris, France</td>
<td>Investigating Stress and Strain due to Operational Information Systems</td>
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<td>073-1521</td>
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<td>Ling Xue, Assistant Professor, Georgia State University, United States, Arun Rai, Professor, Georgia State University, United States, Peijian Song, Associate Professor, Nanjing University, China, Cheng Zhang, Professor, Fudan University, China</td>
<td>The Generation and Impacts of Supplier Process Control Information in Make-to-Order Supply Chain</td>
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<td>445</td>
<td>Sunday, 03:00 PM - 04:30 PM, Birch</td>
<td>Davis Alves</td>
<td>Retail Store Operations III</td>
<td>Retail Operations Management</td>
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<td>073-1465</td>
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<td>Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil, Monalyza Teixeira, Student, Faculdade Santo Agostinho, Brazil</td>
<td>The Influence of Operations Management on Customer Satisfaction of a Shopping Center</td>
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<td>073-0753</td>
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<td>Hao-Wei Chen, Assistant Professor, San Jose State University, United States, Wen-Ya Wang, Assistant Professor, Department of Marketing and Decision Sciences, United States</td>
<td>Managing Product Quality Through Retailer-Initiated Returns</td>
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<td>073-062</td>
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<td>Howard Hao-Chun Chuang, Associate Professor, National Chengchi University, Taiwan, Republic of China, Rogelio Oliva, Professor, Texas A&amp;M University College Station, United States, Subodha Kumar, Professor, Texas A&amp;M University College Station, United States</td>
<td>Identifying the Structure of Group-level Information Decay and Optimizing Inventory Inspection Policy</td>
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<td>073-0991</td>
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<td>Davis Alves, Professor, Universidade Municipal de São Caetano do Sul, Brazil, Mark Tunu, Student, Universidade Municipal de Sao Caetano do Sul, Brazil, Milton Farina, Professor, Universidade Municipal de Sao Caetano do Sul, Brazil, Alexandre Azevedo, Professor, Universidade Municipal de Sao Caetano do Sul, Brazil</td>
<td>Social Networking Analysis: Interorganizational Relationship among Laptop Shopkeepers in the City of Sao Paulo</td>
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<td>446</td>
<td>Sunday, 03:00 PM - 04:30 PM, Auditorium</td>
<td>Sam Wood</td>
<td>Responsive Technologies Corporate Session: Play an online game designed to teach sourcing</td>
<td>Panels, Tutorials, Meetings</td>
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**Chair(s):**

- Willard Price
- Shubin Xu
- Anuragini Shrish
- Ling Xue
- Davis Alves
- Sam Wood

**Track:**

- Information in Operations Management
- Retail Operations Management
- Analytics and Supply Chains
- Responsive Technologies Corporate Session
- Retail Store Operations III
- Panels, Tutorials, Meetings
073-2059  Corporate Session: Play an Online Game Designed to Teach Sourcing  
Sam Wood, President, Responsive Learning Technologies, United States  
Play a new competitive online simulation designed for Purchasing and Supply Chain Management courses. Teams produce inventory, negotiate distribution agreements with other teams, and set retail prices. Learning objectives include inventory control, pricing, double marginalization, two-part tariffs, working capital management, risk-sharing, and negotiation. Bring a laptop if possible.

447  
Sunday, 03:00 PM - 04:30 PM, Maple  
Session: Product Introduction and Diffusion  
Chair(s): Xiaoxuan Zhu  
Track: Marketing and Operations Management Interface  
073-1622  The Impact of Product Concept Demonstration on Strategic Product Line Design  
Taewan Kim, Assistant Professor, Lehigh University, United States  
Ryan Choi, Assistant Professor, Eastern Michigan University, United States  
We study how the product concept demonstration activities interact with the firm's product line design strategy in competitive markets. The equilibrium results indicate that product concept demonstrations in trade shows may have the effect of preempting competition, as well as expanding the market size under certain market conditions.

448  
Sunday, 03:00 PM - 04:30 PM, Cottonwood  
Session: Operations and Finance Models  
Chair(s): Naveed Chehrazi  
Track: Economic Models in Operations Management  
073-0059  Can Dynamic Pricing Reduce What Consumers Pay?  
Achal Bassamboo, Associate Professor, Northwestern University, United States  
Naveed Chehrazi, Assistant Professor, University of Texas Austin, United States  
Yannis Stamatopoulou, Assistant Professor, University of Texas Austin, United States  
We illustrate that when pricing decisions are made in conjunction with other operational decisions, dynamic pricing can result in increased system efficiencies, which can pass-through to consumers. To demonstrate this point, we use the most generic operations model, EOQ.

073-1426  The Effectiveness of Supplier Buy Back Finance: Evidence from Chinese Automobile Industry  
Tunay Tunca, Professor, University of Maryland, United States  
Weiming Zhu, Assistant Professor, I E S E, Spain  
Facing a budget-constrained buyer, a novel approach for large suppliers is adopting buy-back financing schemes to relieve their downstream partners and reduce channel costs. We both theoretically and empirically analyze the efficiency of these financing schemes, and explore their impact on operational decisions and contract design.

073-1999  The Impact of Valuation Heterogeneity and Network Structure on Equilibrium Prices in Supply Networks  
Aiper Nakkas, Associate Professor, Universidade Nova De Lisboa, Portugal  
Yi Xu, Assistant Professor, University of Maryland, United States  
We study how valuation heterogeneity and network structure on equilibrium prices in supply networks by identifying the main factors that influence the equilibrium prices, trading pattern and surplus allocation in such networks. We also show what types of links can be added into a supply network to improve its competitiveness.

449  
Sunday, 03:00 PM - 04:30 PM, Juniper  
Session: Behaviors in Queues  
Chair(s): Sina Ansari  
Track: Service Operations  
073-0581  Managing Service Systems Via Hidden Queues: The Role of Strategic Customer Behavior  
Eren Cil, Assistant Professor, University of Oregon, United States  
This paper studies service firms that can partially hide their waiting lines in order to influence the customer demand. We show that firms can significantly benefit from hidden queues if customers strategically react to the queue hiding tactics whereas any hidden queues hurt firms when they face non-strategic customers.

073-1494  How Experienced Waits Drive Queue Behavior in the Lab  
Zeynep Aksin, Professor, Koc University, Turkey  
Busra Gencer, Student, Universite de Lausanne, Switzerland  
Evrinc Gunes, Associate Professor, Koc University, Turkey  
Ozge Pala, Assistant Professor, Koc University, Turkey  
This paper studies service firms that can partially hide their waiting lines in order to influence the customer demand. We show that firms can significantly benefit from hidden queues if customers strategically react to the queue hiding tactics whereas any hidden queues hurt firms when they face non-strategic customers.
Using laboratory experiments, we study join and quit decisions by subjects from a single server, observable, FCFS queue. We explore the role of queue length and encountered service time experience. We show that reneging behavior is affected by the queue length and experienced service times, for the same total wait.

**073-1603** Queue Joining Decisions When There Is a Prerequisite Condition for Receiving Service
Mona Iampaor Yourdshahy, Student, Sauder School of Business, Canada
Tim Huh, Professor, Sauder School of Business, Canada
Steven Shechter, Associate Professor, Sauder School of Business, Canada

We consider an M/M/1 queueing system in which a customer needs to satisfy a prerequisite condition before receiving service. We investigate whether an individual arriving to this system should join the queue at that time, or wait to join later. We show the structure of optimal policy for this setting.

**073-1765** Server Scheduling Policies for the Queues with Abandonment
Sina Ansari, Student, Northwestern University, United States
Seyed Irvani, Professor, Northwestern University, United States
Laurens Debo, Associate Professor, Dartmouth College, United States

We study the optimal server scheduling policy in a multi-class service system with abandonment. With the objective of minimizing the total average abandonment cost per unit time, we characterize the optimal control policy at the server using Markov Decision Process.

**450**

**Session:** Strategic Customers & Quantity/Pricing Decisions

**Track:** Revenue Management and Pricing

**Chair(s):** Mikhail Nediak

**073-0812** Resale Price Maintenance with Limited Forward-Looking Ability of Strategic Customers
Andrei Bazhanov, Professor, Queens University, Canada
Yuri Levin, , Queens University, Canada
Mikhail Nediak, Associate Professor, Queens University, Canada

Profit of decentralized supply chain under resale price maintenance exceeds profit of centralized SC when customers do not know inventory and are highly strategic. This does not hold under complete information because CSC exploits customer awareness more efficiently than DSC. Thus, overestimation of customer awareness may lead to overcentralization.

**073-0878** Trade Credit and Lifetime Value of a Newsvendor Buyer
Meisam Soltani-koopa, Student, Smith School of Business, Canada
Yuri Levin, , Queens University, Canada
Mikhail Nediak, Associate Professor, Queens University, Canada
Anton Ovchinnikov, Associate Professor, Queens University, Canada

We study a one-layer supply chain in a dynamic Stackelberg game where the retailer is a repeated newsvendor. The supplier maximizes its long-term profit by offering a financing and wholesale price contract while the retailer decides about the ordering quantity and the borrowing amount from the supplier or a bank.

**073-1135** Dynamic Pricing of The Fixed Term Subscription Contract Offered to the Strategic Customers.
Roozbeh Yousefi, Student, Smith School of Business, Canada
Jue Wang, Assistant Professor, Smith School of Business, Canada
Yuri Levin, Professor, Smith School of Business, Canada
Mikhail Nediak, Associate Professor, Smith School of Business, Canada

Service access limits can be stipulated in the subscription contract. We present a continuous-time dynamic pricing model for a monopolist offering a fixed-term subscription contract to strategic customers. We formulate the problem, derive its optimality conditions, and study the structure of the optimal solution and the stationary optimal pricing regime.

**073-1600** On the Relationship Between Quantity Pre-Commitment and Cournot Games
Amr Farahat, Assistant Professor, Washington University St Louis, United States
Tim Huh, Professor, University of British Columbia, Canada
Hongmin Li, Associate Professor, Arizona State University Tempe, United States

We study a two-stage Quantity Pre-commitment game (compete on quantity first and then on price) to a single-stage Cournot game, and show that any equilibrium of the Quantity Pre-commitment game is an equilibrium of the Cournot game, under certain conditions.

**451**

**Session:** Allocations in Risk Pooling Problem

**Track:** Manufacturing Operations

**Chair(s):** Xin Chen    Zhenyu Hu

**073-1901** The Benefit of Scale: Capacity Allocation in Differentiated Service System
Guodong Lyu, Student, National University of Singapore, Singapore
Mabel C. Chou, Associate Professor, National University of Singapore, Singapore
Chung-Piaw Teo, Professor, National University of Singapore, Singapore
Zhichao Zheng, Assistant Professor, Singapore Management University, Singapore
Yuanguang Zhong, Assistant Professor, South China University of Technology, China

We study the capacity pooling problem under Type-1 service level constraints. We show that the capacity required does not scale in the number of customers when we use randomized allocation rule in the class of anticipative policies. We further propose a new responsive rule to characterize the optimal capacity needed.

**073-1116** Outsourcing Maintenance Optimization Model with Data Breaches and Theft
Anh Ta, Student, University of North Texas, United States
Hakan Tarakci, Assistant Professor, University of North Texas, United States
Session: Teaching through Engagement with Industry
Chair(s): Evelin Croce

073-0970 Processes of Management of Stakeholders as a Tool for Development of Corporate Education Projects
Thais Ramos, Student, CEETEPS, Brazil
Murilo Stankevix, Student, CEETEPS, Brazil
José Neves, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil
Celi Langhi, Professor, CEETEPS, Brazil

The development of corporate education projects in companies is growing. This study aims to show that the Stakeholder Management processes, guided by PMBOK, can contribute to the development and evaluation of organizational learning projects. It was concluded that these processes help significantly the generation of organizational knowledge processes.

073-1775 Best Practices in Field Based Education
Michael Gorman, Professor, University of Dayton, United States

I review the literature on field-based education - student training through projects with live projects. I review over twenty articles on field-based training, culling out a common structure, best practices and lessons learned.

073-1843 The Entrepreneur's Profile for the 21st Century: The Importance of Encouraging Entrepreneurship in Education
Evelin Croce, Professor, Centro Paula Souza, Brazil
Roberto Kanaane, Professor, CEETEPS, Brazil

Education and entrepreneurship have been discussed as a way of generating autonomy and employability and as an agent of transformation and wealth. This work reflects on the profile of the entrepreneur for the XXI century, the importance of PBL methodology and the students as protagonist of their own lifelong learning.

Session: Transshipment and Quality
Chair(s): Sayan Chakraborty

073-1297 Multi-Locations Transshipment Problem with Non-Zero Transshipment Times
Olga Senicheva (Rusyaeva), Lecturer, Purdue University, United States
Joern Meissner, Professor, Kuehne Logistics University, Germany

Lead times for inventory repositioning between nearby locations are often neglected in the literature. We examine multi-location inventory systems with transshipments that have non-zero transshipment times. The methods of approximate dynamic programming are used to derive a proactive transshipment policy. The policy outperforms the commonly used deterministic rolling horizon approach.

073-0634 A New Inventory Model for Liquefied Natural Gas Storage and Refueling Facilities
Jose Alejandro Lopez Alvarez,Student, Rijksuniversiteit Groningen, Netherlands
Paul Buijs, Student, Rijksuniversiteit Groningen, Netherlands
Onur Kilic, Assistant Professor, University of Groningen, Netherlands
Iris Vis, Professor, University of Groningen, Netherlands

We address the small-scale Liquefied Natural Gas (LNG) supply chain and propose a new inventory model for LNG storage and refueling facilities. Being a cryogenic fuel, LNG vaporizes throughout the supply chain. The deterioration in quantity and quality—as a result of vaporization—must be considered in inventory management decision-making.

073-1208 An Effective Heuristic Approach for Food Grain Transportation in India
Sayan Chakraborty, Student, IIT Kharagpur, India
Kaushik Bhattacharjee, Reader, IIT Kharagpur, India
Sarada Sarmah, Professor, IIT Kharagpur, India

In this paper, we study the food grain transportation planning problem faced by Food Corporation of India to avoid shortages over the country. We propose an MILP model and an efficient heuristic based solution approach that can be used to solve similar real time problems.
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<td>Operational issues in the emergency department</td>
<td>Martin Land</td>
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| 073-0861 | Novel Instruments for Measuring Emergency Physician Performance in a Multi-Facility Management Network | Krista Foster, Student, University of Pittsburgh, United States  
Jennifer Shang, Professor, University of Pittsburgh, United States |
| 073-0116 | Quantifying Resilience Against Emergency Department Overcrowding | Zachary Davis, Student, Business Information Technology, United States  
Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States |
| 073-1303 | Emergency Care Waiting Time: Beyond Congestion | Martin Land, Associate Professor, University of Groningen, Netherlands |
| 458 | Pricing in healthcare (I) | Fernanda Bravo |
| 073-0576 | Hospital Payment Schemes Under Competition | Zheng Han, Student, University of Kansas, United States  
Mazhar Arikan, Assistant Professor, University of Kansas, United States  
Suman Mallik, Associate Professor, University of Kansas, United States |
| 073-1870 | Healthcare Service Pricing Strategy Under Platform Competition | Yi Luo, Student, Southeast University, China  
Lindu Zhao, , Southeast University, China |
| 073-0285 | Price Discrimination in a Regulated Healthcare Market: Role of Government Subsidy And Price Cap | Jie Song, Associate Professor, Peking University, China  
Frank Chen, Professor, City University of Hong Kong, Hong Kong  
Jianpei Wen, Student, Peking University, China |
| 073-1936 | Contracts for Healthcare Referral Services | Fernanda Bravo, Assistant Professor, University of California Los Angeles, United States  
Elodie Adida, Associate Professor, University of California Riverside, United States |
| 459 | Better Scheduling for Better Healthcare | Zhankun Sun  
Marco Bijvank |
| 073-0147 | Integer Programming Approaches for Appointment Scheduling With Random No-Shows and Service Durations | Ruwei Jiang, Assistant Professor, University of Michigan - Ann Arbor, United States  
Siqan Shen, Assistant Professor, University of Michigan Ann Arbor, United States |
Yazan Roumani, Assistant Professor, Oakland University, United States

Classifying Readmissions to a Cardiac Intensive Care Unit on learning algorithms, and Mixed Networks, based inheritance method is tries to their machine algorithm method and in which fast do a use Networks, Bayesian develop propose is System inference Support to

Ratna Babu Chinnam, Professor, Wayne State University, United States

Logic Bayesian Networks in Clinical Decision Support Systems Using Clustering in Constraint Networks

Lu Kong

Session: Track: Supply Chain Risk Management
Chair(s): Renata Silva

073-0089 Interconnected ICT Integration in Supply Chain Risk Management
Mathias Doetzter, Student, University of Bamberg, Germany
Alexander Pflaum, Professor, University of Bamberg, Germany

We analyze interconnected integration of information- and communication technology between mitigation and resilience phases in different supply chain risk categories. The results are based on a case study approach in the German automotive industry.

073-0373 A Multi-View Ontology for Risk Communication in International Horticultural Value Chains
Shoufeng Cao, Student, University of Queensland, Australia
Kim Bryceson, Associate Professor, University of Queensland, Australia
Damin Hine, Associate Professor, University of Queensland, Australia

The objective of this presentation is to demonstrate a multi-view risk ontology for an end-to-end agent-oriented international horticultural value chain. The designed multi-view risk ontology consists of two levels: (i) define commonly-accepted risk terminologies for system-wide risk communication, and (ii) visualise risk transmission effect from multiple viewpoints.

073-1967 The Effects of Trust on Food Safety Risks: A Study on the Milk Supply Chain
Danielle Pozzo, Student, Pontificial Catholic University of Rio Grande Do Sul, Brazil

This study aims to understand how trust can affect food safety risk level in the milk supply chain. A theoretical model was developed considering the constructs "trust", "perceived risk", "formal control" and "food safety risk level". Then, a survey was conducted with milk chain companies to test the proposed model.

073-1713 Resilience Aspects for the Undesirable Events
Artur Sartori Lopes, Professor, Fundacao Getulio Vargas, Brazil
Jose Barbieri, Fundacao Getulio Vargas, Brazil
Renata Silva, Student, Fundacao Getulio Vargas, Brazil

The objective of this research is to understand how resilience help undesirable events. Ten interviews were conducted with decision makers. The participation of workers, identification of individual's abilities, cooperation between those actors, effective communication and simplification of procedures are integrator's aspects for a better risk management.

Sunday, 04:45 PM - 06:15 PM
Session: Analytics for Decision Support
Chair(s): Lu Kong

073-0309 Logic Bayesian Networks in Clinical Decision Support Systems Using Clustering in Constraint Networks
Elham Nosrat, Student, Wayne State University, United States
Ratna Babu Chinnam, Professor, Wayne State University, United States

We propose a novel algorithm to do inference in large Bayesian Networks, and use this method to develop a Clinical Decision Support System which is fast and reliable. This method is based on Mixed Networks, Bayesian Logic Networks and machine learning algorithms, and tries to inherit their advantages altogether.

073-1487 Classifying Readmissions to a Cardiac Intensive Care Unit
Yazan Roumani, Assistant Professor, Oakland University, United States

We consider an appointment scheduling problem with random no-show and service duration. We propose a distributionally robust optimization model and derive computationally tractable reformulations based on integer programming approaches. Numerical results demonstrate that the proposed approach yields better out-of-sample performance, especially when the randomness is misspecified.

073-1248 Dynamic Scheduling of Social Workers in Elderly Care
Yimin Yu, Assistant Professor, City University of Hong Kong, Hong Kong
Han Zhu, Student, City University of Hong Kong, Hong Kong
Eman Leung, Assistant Professor, City University of Hong Kong, Hong Kong

We consider the dynamic scheduling of social workers in elderly care. We model the the status of patients as a continuous Markov chain. The objective to maximize the length of stays in the elderly care by decide which patients should assistant by social workers.

073-0764 Physician Scheduling To Improve Patient Flow Through Emergency Departments
Farzad Zaerpour, Student, University of Calgary, Canada
Marco Bijvank, Assistant Professor, University of Calgary, Canada
Zhankun Sun, Assistant Professor, City University of Hong Kong, Hong Kong

Emergency department crowding has become a serious concern worldwide. In this study, we develop a mixed-integer stochastic program for assigning physicians to shifts where we include stochastic arrivals and stochastic, physician specific patient-per-hour rates to balance the availability of physicians with the demand for emergency care and reduce wait times.
ICU readmissions are associated with increased risk of morbidity and mortality. We compared the classification performance of three methods for identifying patients who are more likely to be readmitted. Our findings can be used to develop a decision support tool to help clinicians in identifying high risk patients.

073-1730 Assessing Decisions In Medical Referral Networks From Empirical Data
Mojtaba Araghi, Assistant Professor, Wilfrid Laurier University, Canada
Michael Pavlin, Assistant Professor, Wilfrid Laurier University, Canada

Informal referral networks are central to the allocation of medical resources in many healthcare systems. In this paper we assess decisions in a cataract surgery referral network. The system is modeled as a bipartite queueing network and empirical techniques are developed to estimate decision making parameters from aggregate data.

073-1748 The Impact of Living Environment on Healthcare Choices: Insights From New York State Residents
Lu Kong, Student, Cornell University, United States
Hessam Sadatsafavi, Student, Cornell University, United States
Rohit Verma, Professor, Cornell University, United States

We demonstrate relationship between healthcare choices and neighborhood characteristics (e.g. walking, biking options) using structured survey and publicly available data from the state of New York.
This study presents two phase approach that considers efficiency assessment and prediction modeling of US States based on input-output energy indicators. First phase aims to find the efficiency frontier for each US State and second phase applies machine learning technique(s) to predict the future outcomes for the US Energy industry.

**Chair(s):** Roger Solano  
**Session:** Vertical Integrations and Operations Planning  
**Track:** Economic Models in Operations Management

**465** Sunday, 04:45 PM - 06:15 PM, Grand A  
**Session:** Vertical Integrations and Operations Planning  
**Chair(s):** Pengyu Chen  
**073-1821** ‘Tool Port’ to ‘Landlord Port’: Gains From Governance Model Transformation  
Ziaul Haque Munim, Student, University of Agder, Norway  
Naima Saeed, Associate Professor, University of Agder, Norway  
We investigate potential port users’ surplus and profit of terminal operators due to governance model transformation to “landlord port” from “tool port” model. The optimal concession contract for landlord port model is estimated through a non-cooperative game under different settings. We choose Chittagong and Mongla Port to construct the game.

**073-1146** What Makes Manufacturing in a High Cost Environment Successful?  
Subhashish Samaddar, Professor, Georgia State University, United States  
Satish Nargundkar, Associate Professor, Georgia State University, United States  
Economic Geography and Industrial Organization explains the impact of location on the economic success of the firm. TCE and RBV explain how firms bundle resources to be competitive. Informed by these theories and using case data, we investigate what enables a firm to manufacture competitively in a high cost country.

**073-0942** Research on the Total Cost of Ownership of Power Battery Consumer Based on Capacity Fade  
Chunyan Duan, Student, University of Washington, United States  
Jianxin You, Professor, Tongji University, China  
Chao Lu, Lecturer, Shanghai University, China  
Liu Huchen, Associate Professor, Shanghai University, China  
We study the power battery consumer’s total cost of ownership through mathematical modeling and empirical analysis by taking charging mode selections and the power battery’s capacity fade into consideration. Suggestions are provided from measurements of electric vehicle’s economic performance, purchasing and usage decisions of customers and policy improvements.

**073-0162** The Effects and Incentive of Vertical Mergers: An Analysis From the View of OM  
Pengyu Chen, Student, Huazhong University of Science & Technology, China  
He Xu, Professor, Huazhong University of Science & Technology, China  
We investigate the incentive of vertical mergers in a supply chain with suppliers, manufacturers and integrated firms. We also find conditions under which integrated firms selling parts to other manufacturers, analyze the effects of mergers on other firms, industry profit and social welfare, and explore the phenomenon of merger waves.

**466** Sunday, 04:45 PM - 06:15 PM, Grand B  
**Session:** Procurement Strategy and Risk  
**Chair(s):** Martin C. Schleper  
**073-0054** Bidder Characteristics and Behavior in B2B Procurement Auctions  
Alex Scott, Assistant Professor, Northeastern University, United States  
Research suggests that firms behave heterogeneously in B2B auctions, but no empirical studies evaluate what types of firms behave in which ways. We use a longitudinal dataset of spot auctions alongside information on the participating firms’ market orientation and size to understand the propensity to bid and bid prices.

**073-0497** Analyzing Risk in Procurement Focusing Mega Project Supply Chains in India  
Jitender Madaan, Assistant Professor, Indian institute of Technology Delhi IIT, India  
Farhan Ansari, Student, Indian institute of Technology Delhi IIT, India  
This paper gives a pragmatic view on the risk issues related to mega projects supply chain and its procurement process. Paper proposes Interpretive Structural Modeling for mapping potential risk factors in a metro rail project in India and develop a flexible model for sanitizing procurement process risks.

**073-1234** Archetypes of Global Sourcing Decision-Making: The Role of Context  
Alina Stanczyk, Student, Ebs Business School, Germany  
Constantin Blome, Professor, University of Sussex, United Kingdom  
Martin C. Schleper, Assistant Professor, Nottingham Business School, United Kingdom  
We empirically investigate archetypes of global sourcing decision-making along with their respective contingencies. We seek to answer the questions: Which archetypes of global sourcing decision-making exist and how do contextual factors influence these types of global sourcing decision-making?

**467** Sunday, 04:45 PM - 06:15 PM, Grand C  
**Session:** Empirical Studies of Efficiency and Cost  
**Chair(s):** Roger Solano  
**073-1280** A Comparison of Newsvendor Decisions Under Inventory Record Inaccuracy and Supply Uncertainty  
Nienke Hofstra, Student, Vrije Universiteit Amsterdam, Netherlands  
Wout Dullaert, Professor, Vrije Universiteit Amsterdam, Netherlands
Sunday, 04:45 PM - 06:15 PM

468  
**Session:** Data Analytics: New Frontiers and Directions  
**Chair(s):** Vidyanand Choudhary

- **073-0083**  
  **A Hybrid Approach for Hierarchical Time Series Forecasting**  
  Hakeem-Ur Rehman, Student, Shanghai Jiao Tong University, China  
  Guohua Wan, Professor, Shanghai Jiao Tong University, China

A hybrid approach is proposed for hierarchical forecasting (HF) which produce better results compare to the existing methods. Impact of demand features also observed on forecasting performance. We demonstrate the forecast performance evaluation by forecasting the artificially constructed monthly data of 'Industrial' category of M3-Competition study in the form of hierarchy.

- **073-0095**  
  **Allowed Time, Half-Cycle Time, and Recovery Time Analysis for a Rural Transit System**  
  Roger Solano, Associate Professor, Slippery Rock University, United States

This paper analyzes Automatic Vehicle Location (AVL) data from a rural transportation system. We analyze running time, allowed time, half-cycle time, and recovery time. We identified problems with schedule achievability. We determine a statistically based scheduled running time for one route in the system.

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469  
**Session:** Managing Supply Chain Networks and Relationships  
**Chair(s):** Marcus Bellamy

- **073-1048**  
  **The Effects of Network Structural Characteristics on Firm's Productivity Growth**  
  Ta-Wei (Daniel) Kao, Assistant Professor, University of Michigan Dearborn, United States  
  Yi-Su Chen, Assistant Professor, University of Michigan Dearborn, United States  
  Hung-Chung Su, Assistant Professor, University of Michigan Dearborn, United States

This paper analyzes the effects of firm's network position on its productivity growth pattern. Specifically, we adopt the fixed-effect stochastic frontier model to evaluate firm's technical efficiency change, technological change, and Malmquist Productivity index. Theoretical and managerial implications are also discussed.

- **073-0974**  
  **The impact of additive manufacturing on the total supply chain cost of spare parts**  
  Ann Vereecke, Professor, Vlerick Management School, Belgium

A cost model for the total supply chain cost is developed for a global provider of spare parts. The cost is estimated for two scenarios, that is, using conventional fabrication and 3D-printing. The case shows the potential impact of 3D-printing on current and future total supply chain cost.

- **073-0999**  
  **The Influence of Supplier Attributes, Buyer-Supplier Interaction and Buyer-Supplier Dependence on Supplier Sustainability Performance**  
  Dagmar Reinerth, Student, Swiss Federal Institute of Technology Zurich, Switzerland  
  Christian Busse, Senior Lecturer, Swiss Federal Institute of Technology Zurich, Switzerland  
  Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland

Drawing on unique secondary data, this research investigates the influence of supplier attributes (e.g., supplier size), buyer-supplier interaction (e.g., duration of buyer-supplier collaboration), and buyer-supplier dependence (e.g., scarcity of supplier alternatives) on the sustainability performance of the supplier.

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468  
**Session:** Data Analytics: New Frontiers and Directions  
**Chair(s):** Vidyanand Choudhary

- **073-2068**  
  **Panel: Data Analytics: New Frontiers and Directions**  
  Vidyanand Choudhary, Associate Professor, University of California Irvine, United States  
  Sanjeev Dewan, Professor, University of California Irvine, United States  
  Yong Tan, Professor, University of Washington, United States  
  Karthik Kannan, Professor, Purdue University, United States  
  Debrabata Dey, Professor, University of Washington, United States

The increasing use and sophistication of business analytics is creating new opportunities for research and teaching. This panel will discuss some of the key insights from prior research and explore future research directions that are likely to be the most promising.

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469  
**Session:** Managing Supply Chain Networks and Relationships  
**Chair(s):** Marcus Bellamy

- **073-1968**  
  **Cross-Industry Analysis of Supply Network Strategies**  
  Marcus Bellamy, Assistant Professor, Boston University, United States  
  Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States
E-Fulfillment and Its Components: A Review of Literature
Rohit Titiyal, Student, Indian Institute of Technology Kharagpur, India

Delay Compensation and Pricing Strategies during Hot-Selling Period in Online Retailing
Jin Qin, Associate Professor, University of Science and Technology of China, China
Zhennan Yuan, Student, University of Science and Technology of China, China

User Motivations Behind Online Shopping
Mahendra Singh, Student, Yokohama National University, Japan
Yoshiki Matsui, Professor, Yokohama National University, Japan

Delay Compensation and Pricing Strategies during Hot-Selling Period in Online Retailing
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E-Fulfillment and Its Components: A Review of Literature
Rohit Titiyal, Student, Indian Institute of Technology Kharagpur, India
Kalyan Kumar Guin, Professor, Indian Institute of Technology Kharagpur, India

Mitigating the Supply Chain Risk by Decreasing Supply Uncertainty
Xi Shan, Student, University of Texas Dallas, United States
Suresh Sethi, Professor, University of Texas Dallas, United States
Chenglin Zhang, Reader, Southern Methodist University, United States

We study a retailer's procurement problem facing supply chain default risks. The solution is providing a contract menu to suppliers to let them choose from within the capacity of their reliabilities. We show that it is never optimal to let the suppliers be perfect reliable.

Modeling Effects of Correlation in Price Competition
Engin Yildiz, Student, Bogaziçi University, Turkey
Refik Gullu, Professor, Bogaziçi University, Turkey
Taner Bilgic, Professor, Bogaziçi University, Turkey

We consider a price competition game of two firms where the demands observed at the firms are correlated through consumers' willingness to pay for the products or services at these firms. We show characteristics of the response function and discuss properties of the equilibrium under various correlation structures.

Surcharges as a Form of Revenue Management in Container Shipping
Michele Acciaro, Associate Professor, Kuehne Logistics University, Germany

The liner shipping sector is one where the application of revenue management (RM) methods has been least researched. This paper proposes a model that explains the proliferation on surcharges in container shipping as a form of RM and shows the economic benefits that are derived from such approach.

Temporal Distance and Price Elasticity: Empirical Investigation of the Cruise Industry
Mingyu (Max) Joo, Assistant Professor, Ohio State University, United States
Kenneth Wilbur, Associate Professor, UC San Diego, United States
Dinesh Gauri, Associate Professor, University of Arkansas, United States

The conventional view of advance-sales industries, based on evidence from air travel, is that aggregate demand becomes less price-elastic as the advance sales period proceeds. We offer the first evidence that, unlike the airline-based conventional wisdom, cruise demand becomes more sensitive to price during the advance sales period.

Judgmental Demand Forecasting for Online Sales
Arnd Huchzermeier, Professor, Whu - Otto Beiseheim School of Management, Germany
Christoph Diermann, Senior Consultant, Whu - Otto Beiseheim School of Management, Germany

In this paper, we compare two fundamentally different judgmental demand forecasting approaches to estimate demand distributions: parameters obtained from i) a linear regression and maximum likelihood estimation and ii) based on team forecasts and dispersion within the judgmental forecasts. An application in online sales of premium bicycles is presented.

Modeling Effects of Correlation in Price Competition
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Judgmental Demand Forecasting for Online Sales
Arnd Huchzermeier, Professor, Whu - Otto Beiseheim School of Management, Germany
Christoph Diermann, Senior Consultant, Whu - Otto Beiseheim School of Management, Germany

In this paper, we compare two fundamentally different judgmental demand forecasting approaches to estimate demand distributions: parameters obtained from i) a linear regression and maximum likelihood estimation and ii) based on team forecasts and dispersion within the judgmental forecasts. An application in online sales of premium bicycles is presented.

Modeling Effects of Correlation in Price Competition
Engin Yildiz, Student, Bogaziçi University, Turkey
Refik Gullu, Professor, Bogaziçi University, Turkey
Taner Bilgic, Professor, Bogaziçi University, Turkey

We consider a price competition game of two firms where the demands observed at the firms are correlated through consumers' willingness to pay for the products or services at these firms. We show characteristics of the response function and discuss properties of the equilibrium under various correlation structures.
### 073-1706 Structuring a Decision Model for Humanitarian Relief Logistics

Irem Otag, Assistant Professor, Okay University, Turkey  
Sezi Cevik Onar, Assistant Professor, Istanbul Technical University, Turkey  
Iker Topcu, Professor, Istanbul Teknik University, Turkey  

The needs of people that may confront natural, health or man-made disasters necessitate complex but quick responses that may be treated by humanitarian logistics. We propose a multi-criteria decision making approach to support emergency management personnel at humanitarian logistics operations.

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### 073-1756 Location and Routing Decisions for Humanitarian Supply Chains Using a Fuzzy Multi-Objective Approach

Ashish Kaushal, Student, Indian institute of Technology Delhi IIT, India  
Ravi Shankar, Professor, Indian institute of Technology Delhi IIT, India  
Alok Choudhary, Lecturer, Loughborough University, United Kingdom  

In humanitarian supply chains, input data related to victims' requirement, available resources etc., are often imprecise or fuzzy as some information is incomplete or unavailable. This work presents a novel fuzzy multi-objective linear programming (FMOLP) model that solves the location and routing problem for effective disaster response.

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### 073-1757 Warehouse Location Decisions Using Taguchi Loss Function, Fahn and Multi-Choice Goal Programming for Disaster

Ashish Kaushal, Student, Indian institute of Technology Delhi IIT, India  
Ravi Shankar, Professor, Indian institute of Technology Delhi IIT, India  

This study integrates Taguchi loss function, Fuzzy analytical hierarchy process (Fahn) and multi-choice goal programming (MCGP) model for solving the warehouse location problem for effective disaster response. The advantage of this proposed method is that it allows decision makers to set multiple aspiration levels for the decision criteria.

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### 073-1829 An Emergency Routing Model for Post-Disaster Casualty Relief with Consideration of Differentiated Human Sufferings

Li Zhu, Associate Professor, Nanjing Univ Information and Sci & Techn, China  

We propose a model for post-disaster casualty transportation operations. One of innovation is the diversity of sufferable time that victims can stick to be cured, in addition to intuitively different time window constraints. We also pay attention to those casualties with injuries of higher severity and assign emergency response priority.

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### Sunday, 04:45 PM - 06:15 PM, Grand K

#### Session: Resiliency and Information Diffusion

**Chair(s):** Irineu Brito Jr

#### 073-0332 Diffusion of Passenger Information in Metro Emergency

Haifeng Zhao, Associate Professor, Tongji University, China  
Weiija Jiang, Student, Tongji University, China  

The objective of this study is to investigate the process of passenger information dissemination under metro emergency. Based on the epidemic model and mean field theory, we develop a passenger information diffusion model. The model is modified to be suitable for passenger’s habit and positive social reinforcement is considered.

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#### 073-0880 The Impact of Increased Social Media Traffic on Information Diffusion During Disasters

Eunae Yoo, Student, Arizona State University Tempe, United States  
Elliot Rabinoivich, Professor, Arizona State University Tempe, United States  
Bin Gu, Professor, Arizona State University Tempe, United States  

Social media platforms typically experience a surge in activity in disasters. However, increased traffic may obscure information visibility and thereby affect diffusion. Our research investigates how information competes for attention and the effects of this on diffusion speed using a large data set of tweets from multiple disasters.

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#### 073-0882 Evaluating the Drivers of Follower Growth on Social Media for Disaster Relief Organizations

Eunae Yoo, Student, Arizona State University Tempe, United States  
Elliot Rabinoivich, Professor, Arizona State University Tempe, United States  
Bin Gu, Professor, Arizona State University Tempe, United States  

Social media users with larger follower networks can spread information more rapidly and extensively, which is imperative in crises. Using Twitter data from the 2016 Ecuador earthquake, we analyze changes in the follower network topology of organizational users involved in disaster response and identify what mechanisms drive follower growth.

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#### 073-0675 Humanitarian and Commercial Supply Chain Resilience Capabilities: Learning from Each Other?

Julia Brugger, Student, University of Technology Graz, Austria  
Siegfried Voessner, Professor, Technische Universität Graz, Austria  

The purpose of this paper is to take a closer look at supply chain resilience capabilities of organizations involved in humanitarian operations and cross-learning potentials with the commercial world. Therefore, a multiple case study approach was used to identify and explore applied strategies and methods.

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#### 073-1583 Humanitarian Logistics Concepts Presented by the Handbook "How to Make Cities More Resilient"

Maira Oliveira, Student, Fatec São José dos Campos, Brazil  
Irineu Brito Jr, Professor, Universidade De Sao Paulo, Brazil  

This paper aims to identify the concepts of humanitarian logistics that may be applicable for cost-efficient investments in disaster risk reduction and to build resilience. This study is based on the 10 essentials presented by the handbook “How to Make Cities More Resilient” and brings up a literature review.
**Sunday, 04:45 PM - 06:15 PM**

<table>
<thead>
<tr>
<th>474</th>
<th>Sunday, 04:45 PM - 06:15 PM, Regency A</th>
<th><strong>Track:</strong> Environmental Operations Management</th>
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<tbody>
<tr>
<td><strong>Session:</strong> Green Supply Chains</td>
<td><strong>Chair(s):</strong> Andrew Simpson</td>
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</table>

**073-1207** Green Supply Chain Management Practices in the Construction Industry Reduce Carbon and Improve the Sustainability

Mohammed Chowdhury, Student, LSC - Cardiff Metropolitan University, United Kingdom
Md Mostain Belal, Student, Middlesex University, United Kingdom
Arvind Upadhyay, Senior Lecturer, University of Brighton, United Kingdom
Abu Anchari, Student, Manchester Metropolitan University, United Kingdom

Construction industry consumption and production patterns create impact on key environmental aspects such as carbon, energy, water and waste. Green supply chain management Practices (GSCM) in the construction industry is largely established on tangible benefits associated with energy efficiency and reduction of carbon, and improve the building sustainability.

**073-1035** The Impact of Sustainable Supply Chain Management on Firm Value: The Role of Governance Mechanisms

Mengfeng Gong, Student, The University of Sheffield, United Kingdom
Lenny Koh, Student, The University of Sheffield, United Kingdom
Andrew Simpson, Professor, The University of Sheffield, United Kingdom

Employing a large cross-section of UK firms (FTSE 350 listed), we find the corporate sustainable supply chain performance (SSCP) positively affects corporate financial performance (CSP). Furthermore, we find firms with specific corporate governance mechanisms have a significantly positive role in enhancing such causal relationship.

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<th>475</th>
<th>Sunday, 04:45 PM - 06:15 PM, Regency B</th>
<th><strong>Track:</strong> Environmental Operations Management</th>
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<tbody>
<tr>
<td><strong>Session:</strong> Sustainable Supply Chains</td>
<td><strong>Chair(s):</strong> Anirban Adhikary</td>
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**073-0706** Environmental Practices in UK Food Supply Chains: Role of Supplier Collaboration

Abdul Ali, Student, University of Bedfordshire, United Kingdom
Yongmei Bentley, Reader, University of Bedfordshire, United Kingdom
Guangming Cao, Reader, University of Bedfordshire, United Kingdom

This research examines supplier collaboration in environmental practices of UK food supply chains. A conceptual framework is developed, and data analyzed using structural equation modeling. The research confirms that supplier collaboration helps improve environmental practices in UK food supply chains. This study should help widen stakeholder participation in environmental practices.

**073-0494** A Keyword Analysis of Supply Chain Risk and Sustainability Management: Issues and Trends

Hyokyoung Kim, Student, Korea University, Korea, Republic of (South Korea)
Eulbeom Jeong, Student, Korea University, Korea, Republic of (South Korea)
DaeSoo Kim, Professor, Korea University, Korea, Republic of (South Korea)

This study thoroughly examines the area of sustainable supply chain management, focusing on supply chain risk and sustainability (both environmental and social issues) beyond greening. Through a keyword analysis, we uncover the advances in research over time and the linkages among key issues to excavate crucial current and future trends.

**073-1923** Integration of CSR and Risk Management: A Strategic Perspective

Kalinga Jagoda, Assistant Professor, University of Guelph, Canada
Patrick Wojcik, Student, Mount Royal University, Canada
Senxri Kirden, Senior Lecturer, University of Wollongong Australia, Australia

Many organizations have modified their mission statements to encompass corporate social responsibility as a crucial goal in reducing risk. This paper proposes a theoretical framework for analyzing and reducing risk within the oil and gas sector. It also investigates the direct relationship between risk management strategies and CSR.

**073-1210** Impact of Supply Network Structure on Network Level Environmental Performance

Anirban Adhikary, Student, Indian Institute of Management Bangalore, India
Krishna Sundar Diath, Professor, Indian Institute of Management Bangalore, India

Adopting a multi-tier network perspective, this work empirically investigates the impact of a firm’s position and its overall supply network structure on its supply network level environmental performance. Using secondary data from diverse sources, the network effect on supply network level green house gas (GHG) emissions have been studied.

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<tr>
<th>476</th>
<th>Sunday, 04:45 PM - 06:15 PM, Regency C</th>
<th><strong>Track:</strong> Closed Loop Supply Chains</th>
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<tr>
<td><strong>Session:</strong> Emissions Control Policies and Renewable Energy</td>
<td><strong>Chair(s):</strong> Greys Sosic, Hailong Cui</td>
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**073-0537** The Effectiveness Of Consumption vs. Production-Based Emission Tax Under Demand Uncertainty

Jie Ren, Student, University of Michigan Dearborn, United States
Xi Chen, Assistant Professor, University of Michigan Dearborn, United States
Jian Hu, Assistant Professor, University of Michigan Dearborn, United States

In recent years, there has been a debate on whether emission taxes should be imposed at the points of production or directly at consumption. We investigate this important issue in the context of the production, pricing, and emission reduction decisions of a manufacturer in the presence of demand uncertainty.

**073-2037** Dynamics of Capacity Investment in Renewable Energy Projects

Nur Sunar, Assistant Professor, Kenan-Flagler Business School, United States
John Birge, Professor, University of Chicago, United States
Using a continuous time model, we analyze the dynamics of capacity investment in renewable power. In this context, we explicitly identify the optimal policy. We also present some numerical examples to explain the structure of the optimal strategy.

**073-0368**  
**Incentives And Emission Responsibility Allocation In Supply Chains**  
Sanjith Gopalakrishnan, Student, University of British Columbia, Canada  
Daniel Granot, Professor, University of British Columbia, Canada  
Frieda Granot, Professor, University of British Columbia, Canada  
Greys Sosic, Associate Professor, University of Southern California, United States  
HaiLong Cui, Student, University of Southern California, United States

We consider the problem of allocating emission responsibilities in supply chains and propose the Shapley value of an associated cooperative game. We show that it is easy to compute, uniquely characterized by some compelling axioms, and incentivizes firms to exert abatement efforts optimally, in the worst-case, with private abatement costs.

**Sunday, 04:45 PM - 06:15 PM**

**Track: Empirical Research in Operations Management**

<table>
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<tr>
<th>Session: Human Capital 3</th>
<th>Chair(s): Muhammad Abdulrahman</th>
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<tbody>
<tr>
<td>477 073-1165</td>
<td>Estimating the Value of an Apprenticeship Program</td>
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<tr>
<td>Laurie Saarinen, Student, Universite De Lausanne, Switzerland</td>
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<tr>
<td>Susan Helper, Professor, Case Western Reserve University, United States</td>
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<tr>
<td>Suzanne de Treville, Professor, Universite De Lausanne, Switzerland</td>
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Apprenticeship programs represent a potentially value creating investment for technology companies. We evaluate a successful program from option valuation perspective to gain insight into how costs compare to benefits. We show that apprentice-program graduates combine increased flexibility with higher productivity to more than offset the cost of training.

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<tr>
<th>Session: OM Research Employing Simulation and Related Methods</th>
<th>Chair(s): Joel Goldhar</th>
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<tbody>
<tr>
<td>478 073-1043</td>
<td>Decision Analysis in Complex Production Systems Using Simulation and Social Judgment Theory</td>
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<tr>
<td>Thomas Ladinig, Student, Szechenyi Istvan University, Hungary</td>
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<tr>
<td>Gyula Vastag, Professor, Szechenyi Istvan University, Hungary</td>
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We use a behavioral approach to organizational decision-making in a complex production system by combining tools of social judgment theory with OR methods. The results of a discrete event simulation are combined with judgments of the management team about potential performance improvements within the production of an automotive manufacturer.

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<tr>
<th>Session: OM Research Employing Simulation and Related Methods</th>
<th>Chair(s): Joel Goldhar</th>
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<tbody>
<tr>
<td>478 073-1720</td>
<td>Behavioral Operation Teaching Based on Process Simulation Under a Center Participant Learning Method</td>
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<tr>
<td>Miguel Estrada, Professor, Ipade Business School, Mexico</td>
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This work presents how behavioral operations can be taught using process simulation based on participant-centered methodologies such as role playing with real actors and dynamic case analysis of complex representation of business’s flows.

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<th>Session: OM Research Employing Simulation and Related Methods</th>
<th>Chair(s): Joel Goldhar</th>
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<tr>
<td>478 073-0899</td>
<td>Presenteeism and Absenteeism Related to Depression: A Computational Investigation</td>
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<tr>
<td>Haomiao Jin, Student, University of Southern California, United States</td>
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Loss-of-productivity caused by depression is $110 billion/year in America. A reinforcement learning (RL) model is developed to simulate presenteeism/absenteeism behavior of depressed employees. A sequential computer-experimental design is used to investigate the relations among cognitive impairments (modeled by abnormal RL parameters), reward structure, and presenteeism/absenteeism behavior. Management implications are discussed.

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<th>Session: OM Research Employing Simulation and Related Methods</th>
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<tr>
<td>478 073-0447</td>
<td>Integrating Human Behavior Issues Into the MBA OM Core Course</td>
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<tr>
<td>Joel Goldhar, Professor, Illinois Institute of Technology, United States</td>
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<tr>
<td>Matt Lauritsen, Student, Illinois Institute of Technology, United States</td>
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Most OM required core courses emphasize optimization techniques and Industrial Engineering Tools and Techniques. We offer a sample curriculum design that adds, and integrates, consideration of the ‘Human Element’ and Organization Design variables. This becomes increasingly important as OM moves toward Services and Experiences processes.
Sunday, 04:45 PM - 06:15 PM

**073-1753**  Analyzing The ROI of Conducting Occupant Energy Saving Intervention Using Deterministic and Probabilistic Approaches  
Shuoqi Wang, Student, University of Washington, United States  
Amy Kim, Assistant Professor, University of Washington, United States  
Emma Johnson, Resource Conservation Manager, City of Bellevue, United States

To determine whether the reduction in building energy consumption justify the cost of occupant based plug load monitoring, a series of hypothesis tests were carried out using empirical data and significant reduction of energy usage were found during post-intervention period. The return-on-investment was evaluated using both deterministic and probabilistic methods.

**073-1022**  Biogas Upgrading Facility Location and Allocation Decisions  
Jan Eise Fokkema, Student, Rijksuniversiteit Groningen, Netherlands  
Martin Land, Associate Professor, University of Groningen, Netherlands

In search of sustainable fuels, biogas is an interesting alternative that allows obtaining energy from biomass. However, several logistic challenges exist related to biogas upgrading and electricity production. This study utilizes numerical simulations to examine upgrading facility location problems by focusing on biogas allocation decisions under volatile energy prices.

**073-1467**  Performance in Knowledge-Intensive Environments: Interplay among Worker, Supervisory and Organizational Experience  
Juan Madiedo, Assistant Professor, Rotterdam School of Management, Netherlands  
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States  
Fabrizio Salvador, Professor, Instituto De Empresa, Spain

Using information on the operation of a Fortune-100 company we find evidence that the interplay between worker’s execution experience and manager’s supervisory experience has a significant effect on the worker’s task execution performance. Moreover, our findings reveal that such effect is contingent on the level of the organization’s overall experience.

**073-0689**  Role of the Internet of Things in Shaping Distribution Networks - Case Studies  
Natalia Szozda, Assistant Professor, University of Economics, Poland

The aim of the presentation is to demonstrate the impact that the Internet of Things has on the organization of product and information flow in distribution networks of modern supply chains. In order to meet this aim, the case studies of European supply chains will be presented.

**073-1100**  TMT Transactive Memory System, Shared Leadership and Ambidexterity  
Qian Chen, Student, University of Science and Technology of China, China  
Zhiying Liu, Professor, University of Science & Technology, China

Although transactive memory system (TMS) in top management team (TMT) has been shown to benefit innovation ambidexterity, the mechanisms underlying this effect are still ambiguous. We identify TMS as micro-foundation of heterogeneous cognition, and suggest that the link between TMS and innovation ambidexterity is mediated by TMT shared leadership.

**073-1611**  Digitalization in Small and Medium Sized Enterprises  
Wolfgang Kersten, Professor, Hamburg University of Technology, Germany  
Henning Schoepfer, Student, Hamburg University of Technology, Germany

Digitalization changes the way of operations in all industries. For an efficient use of digitalization it is important to cover the whole supply chain including small and medium sized enterprises. Our study analyses the current state of digital transformation in German SMEs and outlines a framework for successful implementation.

**073-1790**  Innovation Contests with Endogenous Participation  
Konstantinos Stouras, Student, The Darden School, University of Virginia, United States  
Raul Chao, Associate Professor, University of Virginia, United States

Through an analytical model, we examine the best strategy for a firm that outsources innovation to an online community of users who voluntarily participate.

**073-0307**  Crowdsourcing and Open Innovation: A Literature Review to Compose a Theoretical Framework  
Marcelo Okano, Professor, CEETEPS, Brazil  
Eliane Simoes, Professor, CEETEPS, Brazil

We study what theoretical foundations help build crowdsourcing for open innovation generation in institutions or companies. The objective is to investigate the foundations that make up the theoretical framework of the subject through a theoretical revision, which allows a researcher to analyze and evaluate both the research within a domain.

**073-0520**  Are More Frequent Releases Always Better? Dynamics of Pivoting and the Minimum Viable Product  
Edward Anderson, Professor, University of Texas Austin, United States  
Nitin Joglekar, Associate Professor, Boston University, United States
### 073-0445 Bayesian Network Model for Quality Control with Categorical Attribute Data

Barry Cobb, Associate Professor, Missouri State University, United States

Using the system dynamics methodology, we model the minimum viable product (MVP) approach to product development and examine the impact of release frequency, planning practices and committed reengineering capacity on software development outcomes. We leverage the organizational learning, Lean Startup, and Agile methodology literature.

### 482 Session: E-Business and Logistics  (Track: Scheduling and Logistics)

#### 073-0385 JIT Picking and Delivering of Orders for Online Supermarkets

**Chair(s):** Nesim Erkip

Minfang Huang, Associate Professor, North China Electric Power University, China
Yanxin Wang, Lecturer, Business College of Beijing Union University, China
Xiangpei Hu, Professor, Dalian University of Technology, China

For a great amount of customized orders of online supermarkets, each of them should be fulfilled through the processes of order picking, packing, loading and delivering. The paper attempts to incorporate the streamline processing and JIT production of multi-type and small batch items into order fulfilment.

#### 073-1150 Enhancing E-Commerce Cost-Effective Deliveries Through Integrated Logistics Platform

Lindawati Lindawati, Reader, National University of Singapore, Singapore
Robert De Souza, Professor, National University of Singapore, Singapore

The real crux of the challenges in e-commerce logistics is about the fulfillment matched to the needs of each unique environment e-commerce has to serve. We propose E-Commerce Logistics Management (ELM) as a platform to integrate critical success factors and concepts in last mile fulfillment for cost-effective deliveries.

#### 073-1269 Shipment Consolidation Under Different Delivery Date Options For E-tailing

**Chair(s):** Matthew Petering

Nesim Erkip, Professor, Bilkent University, Turkey
Tugce Vural, Student, Sm(e)all College of Business, United States

We consider shipment consolidation for an e-retailer that provides two types of services. In regular service, the e-retailer guarantees a maximum delivery time, whereas in premium service customers receive in negligible time. Under deterministic demand structure of optimal policy is derived using KKT conditions. Uses and extensions are discussed.

### 483 Session: X-channel Demand Fulfillment  (Track: Retail Operations Management)

#### 073-1933 Optimizing Multi-Objective Omnichannel Order Fulfillment

Ayaj Deshpande, Research Staff Member, IBM, United States
Ali KOC, Senior Software Engineer, IBM, United States
Xuan Liu, Principal RSM, IBM, United States
Brian Quanz, Research Staff Member, IBM, United States

To help retailers leverage their store network in fulfilling online orders, we propose a two-stage multiple-objective optimization problem that assigns items in an order to nodes in the network and selects the most economical carrier while meeting the customer promise date. We provide computational results for heuristic and exact methods.

#### 073-0536 Impact of a Pickup Depot on a Retailer with Impatient Customers and Online Competition

James Cao, Assistant Professor, University of Saskatchewan, Canada
Rick So, Professor, University of California Irvine, United States

A pickup depot can be an attractive option for customers who are too impatient to wait for delivery of online orders. We develop an analytical model to evaluate the costs and benefits of implementing such a distribution channel and provide guidance regarding conditions in which it would be most beneficial.

#### 073-0490 Multi-Channel Retailing: Inventory and Pricing Issues

Jaimini Bhattacharyya, Student, Indian Institute of Technology Madras, India
Rahul Marathe, Associate Professor, Indian Institute of Technology Madras, India
Srinivasan G, Professor, Indian Institute of Technology Madras, India

We find an optimal strategy for a manufacturer to allocate inventory amongst various retailing channels in order to maximise her utility. The manufacturer is the Stackelberg leader who announces the capacity available, and proposes inventory for each channel. We also design a pricing strategy to mitigate the channel conflicts.

### 484 Session: Learning in Manufacturing Operations  (Track: Manufacturing Operations)

#### 073-0445 Bayesian Network Model for Quality Control with Categorical Attribute Data

Barry Cobb, Associate Professor, Missouri State University, United States

We use discrete event simulation and optimization to compare options for assigning the orders placed with an online retailer to the retailer’s fulfillment centers. We show that large online retailers can significantly reduce total shipping costs by intelligently reevaluating their order fulfillment plans.
A Bayesian network is developed for quality control with categorical data. Sample items from each category are entered, allowing calculation of the revised probabilities of the system operating in one of multiple out-of-control states. The model can accommodate unequal sample sizes and intervals, as well as qualitative observations.

073-0776 Machine Learning, Waveless Picking, and Automated E-commerce Warehouses
Nima Zaerpour, Assistant Professor, California State University San Marcos, United States
Sholeh Norouzzadeh, Student, California State University San Marcos, United States
Amazon enjoyed its biggest day ever on Prime-Day 2016; a whopping 600 orders/second. Such a growth of online shopping next to piece picking, and same-day delivery require responsive and adaptive automated e-commerce warehouses. Can Machine learning improve the performance of such warehouses? We show the answer is yes!

073-1785 Developing and Deploying Lean Leadership Practices Through Action Learning
Daryll Powell, Associate Professor, Norwegian University of Science And Technology, Norway
Torbjørn Netland, Assistant Professor, ETH Zurich, Switzerland
It is suggested that the most effective kind of managerial leadership arises through learning and development opportunities based on action learning principles. In our research, we adopt and discuss the use of action learning for the development and deployment of lean leadership practices in a Norwegian hi-tech multinational organization.

073-0374 Analyzing the Operations Strategy of a Diagnostic & Medical Research Centre
Parikshit Charan, Assistant Professor, Indian Institute of Management Raipur, India
Sanat Panda, Central Excise Officer, Department of Revenue, Govt. of India, India
Jitender Madaan, Assistant Professor, Indian Institute of Technology Delhi IIT, India
Manojit Chattopadhyay, Assistant Professor, Indian Institute of Management Raipur, India
The paper uses Terry Hill Framework to analyze the operations strategy of a Diagnostic & Medical Research Centre. It recommends possible operational strategic solutions in structural and infrastructural dimensions to complement the respective business objectives and enhance the operational efficiency and effectiveness.

485 Sunday, 04:45 PM - 06:15 PM, Maple
Session: Targeted Promotions
Chair(s): Benjamin Lawrence

073-1588 Robust Integrated Ad Delivery Planning for Targeted Display Advertising
Huaxiao Shen, Assistant Professor, Sun Yat-Sen University, China
Yanzhi Li, Associate Professor, City University of Hong Kong, Hong Kong
Frank Chen, Professor, City University of Hong Kong, Hong Kong
An online display advertising publisher faces a trade-off between earning greater short-term spot-market profit and improving upfront market advertising effectiveness. To address this challenge, we propose an integrated planning model that is robust to the uncertainties associated with advertising resources. Numerical experiments based on real data demonstrate our method's effectiveness.

073-1812 Competition Strategies for Location-based Mobile Coupon Promotion
Pengcheng Xia, Student, The Hong Kong Polytechnic University, Hong Kong
Gang Li, Professor, School of Management, China
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China
Retailers target consumers via location-based mobile coupons (LBMCs) to enhance market performance. We find that under different market intensities, only no adoption and symmetric adoption of LBMC promotion are the possible equilibria for competing retailers at a low marginal targeting cost. We also extend our model to consider quality differentiation.

073-1813 Why and How Do Branders Sell New Products on Flash Sales Platforms?
mingshang Zhang, Student, Beijing Jiaotong University, China
Juliang Zhang, Professor, Beijing Jiaotong University, China
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China
guowei hua, Professor, Beijing Jiaotong University, China
Flash sales is a marketing mode under which brander firms sell products at discounted price within a specified time. We construct a two-period model and characterize the brander’s optimal policy. We show the aim of using the flash sales platform is for product promotion or as a profit source.

073-0229 The Impact of Advertising Expenditures on Profitability in Franchised Outlets
Benjamin Lawrence, Assistant Professor, Cornell University, United States
Jie Zhang, Assistant Professor, University of Vermont, United States
Liwu Hsu, Assistant Professor, University of Alabama Huntsville, United States
We examine advertising allocation at the unit level with line items from the P&L statements of over 3,500 franchised hotel properties. We find that outlets underinvest in national and local advertising and that franchisee independence moderates the effect of different types of advertising expenditures on performance.

486 Sunday, 04:45 PM - 06:15 PM, Cottonwood
Session: Game Theoretic Models
Chair(s): Harish Krishnan

073-1723 The Paradox of Choice in Matching: How Can Platforms Facilitate the Search for Partners?
Yash Kanoria, Assistant Professor, Columbia University, United States
Daniela Saban, Assistant Professor, Stanford University, United States
We consider a dynamic model of two-sided matching market with search frictions, and study the impact of the platform design on the efficacy of the marketplace in serving the users. We find that a few different solutions may be optimal in different settings.

073-1755 Should Brands Tighten Certification Standards?
Li Chen, Associate Professor, Cornell University, United States
Shiqing Yao, Lecturer, Chinese Univ of Hong Kong, Hong Kong
Kaijie Zhu, Associate Professor, Chinese Univ of Hong Kong, Hong Kong

Global brands are increasingly relying on third-party certification to screen out low-quality suppliers. However, an unethical certifier may collude with a low-quality supplier to produce a false certification. In this study, we investigate the buyer's equilibrium strategy in setting certification standard under the risk of supplier-certifier collusion.

073-1612 Managing Reputation Risk in Supply Chains
Vibhuti Dhingra, Student, University of British Columbia, Canada
Harish Krishnan, Associate Professor, University of British Columbia, Canada

Multinationals are increasingly facing "reputation risk" due to improper conduct of their suppliers. Lack of transparency in supply chains can allow suppliers to take actions that benefit them but threaten the buyer's reputation. We study the role of incentives and financial tools in designing contracts that ensure suppliers behave responsibly.

487 Sunday, 04:45 PM - 06:15 PM, Juniper
**Session:** Servitization and Contracts
**Chair(s):** Xuying Zhao

073-0585 Antecedents of Service Strategy Adoption by Manufacturing Firms
Sina Golara, Student, ASU, United States
Kevin Dooley, Professor, Arizona State University Tempe, United States

Diversification into services has been a popular strategy among some manufacturers. This paper attempts to investigate the drivers of this phenomenon by analyzing service strategies of U.S. public manufacturers. Using a financial panel, we conduct a multi-level analysis to reveal the antecedents of different types of service strategies.

073-0782 The Impact of Servitization on Firm Performance: A Service Dominant (S-D) Orientation Perspective
Nihar Kumthekar, Student, Georgia Southern University, United States
Kwabena Boakye, Assistant Professor, Georgia Southern University, United States

Servitization (i.e., integrating service design, strategy, delivery, and processes) as a manufacturing firm strategy has produced ambiguous findings in its relationship with firm performance. Thus, we propose a service dominant (S-D) orientation approach to help firms develop capabilities needed to cover various methods of customer value co-creation to improve performance.

073-1657 Service Firm Diversification and Coordination Costs
John Goodale, Associate Professor, Southern Illinois University Carbondale, United States
Sumeet Jhamb, Student, Southern Illinois University Carbondale, United States
Ye Dai, Assistant Professor, Southern Illinois University Carbondale, United States

Service operations have distinctive characteristics such that package and/or market diversification strategies warrant a service-specific investigation. This study explores the impact of coordination costs (Zhou, 2011) that arise when firms diversify. Moderating variables that influence the relationship between diversification and coordination costs are examined.

073-1029 Economic Analysis of Mobile Service Contracts
Xuying Zhao, Associate Professor, University of Notre Dame, United States
Hong Guo, Associate Professor, University of Notre Dame, United States
Gangshu Cai, Associate Professor, Santa Clara University, United States
Subhajyoti Bandyopadhyay, Associate Professor, University of Florida, United States

Mobile carriers usually offer two-year contracts to consumers. However, recently major mobile carriers are eliminating contracts. We investigate carriers' service contract and marketing strategies. Our findings offer explanations for the observed practice. We also explore the impact of carriers' service contract and marketing strategies on consumer welfare.

488 Sunday, 04:45 PM - 06:15 PM, Laurel
**Session:** Dealing with Uncertainties in Service Systems
**Chair(s):** Nikhil Varma

073-1940 Information Directed Policy Sampling in MDPs with Parametric Uncertainty
Peeyush Kumar, Student, University of Washington, United States
Archis Ghate, Associate Professor, University of Washington, United States

We study the problem of policy sampling in MDPs with parametric uncertainty. This research develops an information theoretic algorithm for efficiently finding policies that maximize the expected reward while learning the true MDP. This algorithm provides an explicit formulation of trade-off and strong bounds in problems with complex information structure.

073-1402 Voice of the Machine: Machine Diagnostics and Service Supply Chain Inventory Management
Daniel Steeneck, Assistant Professor, Air Force Institute of Technology, United States
Daniel Gettens, Chief Analytics Officer, OnProcess, United States
Chris Caplice, Professor, Center for Transportation and Logistics, United States

IoT enables remote monitoring of status and usage information from products in the installed base. Signals based on binary classifiers are used to predict individual product failures and can be seemingly useless. Even so, by applying a Bayesian forecast update, service part forecasts can be significantly improved.
Assignment Model Solution for Challenges in Complex Service Systems
Miguel Ruiz, Student, University of Puerto Rico, United States
Betzabe Rodriguez, Associate Professor, University of Puerto Rico, Puerto Rico

Our research tailors the assignment model to account for common challenges faced by service organizations such as detrimental benefit of fulfilling tasks with unfit resources, myriad of tasks and diverse personnel profile. The proposed model will use as a test bed the Puerto Rico Agricultural Extension Service.

Dynamic Service Design Using Behavioral Analytics
Nikhil Varma, Assistant Professor, Ramapo College of New Jersey, United States
Julie Paquette, Associate Professor, HEC Montreal, Canada
Federico Pasin, Professor, HEC Montreal, Canada

The research assists managers’ by providing a model for dynamic service design. Artificial neural networks (ANN) is trained using behavioral data from service infusion in an online car purchase experiment. The trained ANN is then used to dynamically hypothesize a service portfolio based on a user’s behavioral interaction with the system.

Assessing the Effectiveness of Value Stream Analysis Towards the Lean Improvements: An Application-Based Approach
Garima Rathaur, Student, Shri G.S. Institute of Technology and Science, Indore MP, India
Kumar Rohit, Student, Indian Institute of Technology Kharagpur, India
Avadhesh Dalpati, Associate Professor, Shri G.S. Institute of Technology and Science, Indore MP, India

This study evaluates the significance of value stream mapping tools implied for value stream analysis to interpret which type of tool will best suit to eliminate different lean wastes. The interpretations portray future process improvements in terms of quantitative data like reduction in supplier lead time and inventory level.

Toward the Operationalization of Production Systems - Simultaneously Increasing Effectiveness and Efficiency
Nicolas Ponce, Student, University of St. Gallen, Switzerland

In recent history, multinational corporations from all industries have established their own production systems. However, most of them fail to quantify its influence on the company’s overall performance. The proposed research work empirically analyzes these interrelations by matching production principles and performance metrics generated from 336 pharmaceutical manufacturing sites.

Measuring Over-Complexity in Global Production: The Ninth Waste of Lean Production?
Amardeep Banerjee, Project Engineer - Complexity management in industry, Mannheim University, Germany
Boris Brinzer, Professor, Competence centre for modern production, Mannheim University of Applied Sciences, Germany
Michael Hauth, Professor, KMP Hochschule Mannheim, Head IntraLogistics group, Germany

The Lean Production philosophy has universal applications; but there is an ongoing debate about its positive and negative consequences on shop floor operations. Complexity management which is more than variety management, views takes into account perspectives of all process stakeholders could extend the Lean production.

The Process of Operational Capability Development
Alexandre Prim, Student, Fundacao Getulio Vargas, Brazil
Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil

Previous studies have shown that the operational capabilities influence the firms’ performance, however do not demonstrate how they are created and transformed. We address a discussion in this gap by developing a theoretical framework to evaluate the operational capabilities development through coevolutionary theory.

Scaling Up PhD Numbers in an Indian Academic Institution
Supriya Ghatak, Student, Indian Institute of Technology Kharagpur, India
Biswajit Mahanty, Professor, Indian Institute of Technology Kharagpur, India

Indian academic-institutions are not quite able to meet the country’s requirement of doctoral-degree-recipients (PhD) in terms of numbers. This paper tries to find out the bottlenecks that inhibit the growth. Dynamic-simulations found that increase in PhD is possible only with simultaneous growth of research-infrastructure, faculty-strength, and postdoctoral-support with the increasing-intake.

Optimization in Team Formation Problem
Hoda Atef Yekta, Student, University of Connecticut, United States
Robert Day, Associate Professor, University of Connecticut, United States
David Bergman, Assistant Professor, University of Connecticut Storrs, United States

We model a team formation problem as an exponentially sized integer programming problem which optimizes stability and efficiency simultaneously, and propose a branch-and-price algorithm to solve it. We also compare our solutions with existing algorithms on efficiency, fairness, stability, and strategic effects.

Quality Control Rules: How the Number of Rules Impacts Compliance and Quality Level
Anna Devlin, Assistant Professor, University of Alabama Huntsville, United States
Jatinder Gupta, Professor, University of Alabama Huntsville, United States
To regulate quality level, companies implement sets of quality control rules or checklists. In this research, we examine whether the number of quality control rules determines the number of rules employees comply with. We find that employees are demotivated by large numbers of rules that negatively impacts ultimate quality levels.

Gender Biases and Differences in Online Equity Crowdfunding
Mingfeng Lin, Assistant Professor, University of Arizona, United States

We study whether there is a gender difference in the probability of securing financing through online crowdfunding, using proprietary data from a large platform. We also report behavioral differences between female and male investors in this nascent market.

Strategic Planning: The Steps of Strategic Planning
José Campanele, Professor, IFSP - Instituto Federal de São Paulo, Brazil
Jose Martino Neto, Professor, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Francisco Costa, Student, UNISANTOS, Brazil

This research highlights the essential steps in the process of developing and implementing strategic planning. The purpose of the research is to make a comparison between the methodologies developed by the main authors of the subject, synthesizing them within an illustrative and explanatory framework.

How Do Macro and Micro Environment Affect the Inventory Adjustment Speeds of US Manufacturing Firms?
Shih-Sian Jhang, Student, University of Buffalo, United States
Joseph Ogden, Professor, University of Buffalo, United States

We examine how the inventory adjustment speeds toward target inventory are related to the deviation from the target inventory, macro environment, and financial strength of firms. The empirical dataset covers the U.S. manufacturing sector from 1984 to 2014.

The Strategic Vision of Inventory Management and Customer Service Level in a Brazilian Environment
Wagner Delmo Croce, Student, Centro Paula Souza, Brazil
Cláudio Dona, Student, Centro Paula Souza, Brazil
Clayton Mangini, Student, Centro Paula Souza, Brazil
Julio Cruz, Student, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil

This study shows the usefulness of a strategic and systemic vision of inventory management identifying interest conflicts among inventory level, marketing interests and finance issues. It was performed by an analytical study and literature search on the topic as customer service dimensions impact service level performance indicators.
### Sessions for Monday, May 08

#### Monday, 08:00 AM - 09:30 AM

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<tr>
<th>Track: Empirical Research in Operations Management</th>
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<tr>
<td><strong>495</strong></td>
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<tr>
<td><strong>Session:</strong> Bidding Behavior, Decision Bias, and Customer Satisfaction</td>
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<tr>
<td><strong>Chair(s):</strong> Abdulkareem Awwad</td>
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<tr>
<td><strong>073-1564</strong></td>
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<tr>
<td>Newsvendor Decision Bias: Empirical Evidence from Smart Card Reloading</td>
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<tr>
<td>Wei Geng, Associate Professor, Southwest Jiaotong University, China</td>
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<td>We develop a Newsvendor model for some bus passengers' smart card reloading decisions, and manage to find new empirical evidence on Newsvendor decision bias, which has drawn sustained discussions since two decades ago but most existing literature stands by means of laboratory experiments.</td>
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<td><strong>073-0327</strong></td>
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<tr>
<td>Bidding Behavior in Below Average Bid Mechanism for Procurement Auction</td>
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<tr>
<td>Zihan Yin, Student, Peking University, China</td>
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<tr>
<td>Shijie Deng, Associate Professor, Georgia Institute of Technology, United States</td>
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<tr>
<td>Ming Lei, Professor, Peking University, China</td>
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<tr>
<td>Procurement auction data of China's electricity industry is studied to investigate bidding behavior including entering, pricing and colluding under below average bid mechanism. Factors from multiple-levels of auction configuration, bidder heterogeneity and market information are explored. Collusion detection method and managerial suggestions are proposed to improve this prevalent bid mechanism.</td>
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<tr>
<td><strong>073-0291</strong></td>
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<tr>
<td>Competitive Priorities as Measurements for Customer Satisfaction: Evidence From the Telecommunication Industry in Qatar</td>
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<tr>
<td>Abdulkareem Awwad, Associate Professor, Qatar University, Qatar</td>
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<tr>
<td>This study is carried out in the telecommunication industry in Qatar as an attempt to develop measurement scales for customer satisfaction through the competitive priorities that comprised of (quality, cost, dependability, speed, and flexibility). The results showed empirical evidence on the role of competitive priorities in meeting customer satisfaction.</td>
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#### Monday, 08:00 AM - 09:30 AM

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<th>Track: Healthcare Operations Management</th>
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<td><strong>496</strong></td>
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<tr>
<td><strong>Session:</strong> Healthcare supply chain management</td>
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<tr>
<td><strong>Chair(s):</strong> Yunsik Choi</td>
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<td><strong>073-0067</strong></td>
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<tr>
<td>RFID and Hospitals of the Future</td>
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<tr>
<td>Afrooz Moatari-Kazerooni, Assistant Professor, Adelphi University, United States</td>
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<tr>
<td>As hospitals are aiming to decrease costs throughout their supply chain, RFID technology is evolved as an effective solution for tracking equipment, people, and medical data. How the future of healthcare is influenced by different adaptation of RFID in hospital’s supply chain is discussed along with its benefits and barriers.</td>
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<tr>
<td><strong>073-0971</strong></td>
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<tr>
<td>Development of a Comprehensive Framework for Identification and Prioritization of Risks in Healthcare Supply Chain</td>
</tr>
<tr>
<td>DinDayal Agrawal, Student, Indian institute of Technology Delhi IIT, India</td>
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<tr>
<td>Jitender Madaan, Assistant Professor, Indian institute of Technology Delhi IIT, India</td>
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<tr>
<td>Healthcare supply chain (HSC) is very complex, dynamic, and is subjected to various risks. The first step towards the mitigation of risks is their identification and prioritization. In this work we have developed a comprehensive framework to identify and prioritize various risks in HSC using multi-criteria decision making (MCDM) techniques.</td>
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<tr>
<td><strong>073-1365</strong></td>
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<tr>
<td>Effects of Hospital Occupancy and Demand Variation (Patient Volume and Case Mix) on Hospital Performance</td>
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<td>Yunsik Choi, Student, Clemson University, United States</td>
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<td>Lawrence Fredendall, Professor, Clemson University, United States</td>
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<td>Aleda Roth, Professor, Clemson University, United States</td>
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<td>Babur De los Santos, Assistant Professor, Clemson University, United States</td>
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<td>Michael Makowsky, Assistant Professor, Clemson University, United States</td>
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<td>We examine the effect of hospital occupancy and demand variation on time from admission to procedure start (stage 1) and the time from procedure end to discharge (stage 2). We investigate the effect of occupancy and variation on stage 1 and 2 completion times and on readmission and mortality rates.</td>
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#### Monday, 08:00 AM - 09:30 AM

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<tr>
<th>Track: Energy and Natural Resources</th>
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<td><strong>497</strong></td>
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<tr>
<td><strong>Session:</strong> Empirical methods in energy</td>
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<td><strong>Chair(s):</strong> Roula Michaelides</td>
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<td><strong>073-1995</strong></td>
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<tr>
<td>Forecast of Shanghai’s Energy Demand</td>
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<td>Xuan Tu, Student, Tongji University, China</td>
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<td>Jianxin You, Professor, Tongji University, China</td>
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<td>Chunyan Duan, Student, University of Washington, United States</td>
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<td>The energy security of Shanghai will pose a daunting challenge for the city as its economy continues to grow. The paper makes forecasts of Shanghai’s long-term energy demand in three sectors: manufacturing, transportation and construction, based on a revised GM (1,1) model which adds PSO to increase the forecast accuracy.</td>
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<tr>
<td><strong>073-1064</strong></td>
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<tr>
<td>The Choice of Energy Saving Modes for an Energy-Intensive Manufacturer</td>
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<td>Jianjun Ouyang, Lecturer, Shihezi University, China</td>
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<td>Houcai Shen, Professor, Nanjing University, China</td>
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<td>In this paper, we will discuss the choice for an energy-intensive manufacturer facing self-saving and shared savings options. We find that the manufacturer will prefer the second option to the first when the investment cost factor ratio of the energy service company (ESCO) to the manufacturer is small.</td>
</tr>
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Monday, 08:00 AM - 09:30 AM

**073-0164**  
**Relationships Between TQM Practices and Performance in Upstream Operational Activities in Oil and Gas Companies**  
David Bryde, Professor, Liverpool John Moores University, United Kingdom  
Christine Unterhitzenberger, Lecturer, Liverpool John Moores University, United Kingdom  
Roula Michaelides, Senior Lecturer, Management School, United Kingdom  
Khalil Sawalmi, Student, Liverpool John Moores University, United Kingdom  
Yusra Mouzuzhi, Professor, Muscat University, Oman

The soft-hard TQM practices which lead to enhanced project performance in the upstream operational activities of oil and gas companies in the Middle East and North Africa are identified. Informed by 12 exploratory interviews, a practice-performance model is derived from survey data (n=161) using structured equation modelling.

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**073-1876**  
**Risk Analysis in Mobile Banks**  
Antonio César Galhardi, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil  
Getulio Akabane, Retired, CEETEPS, Brazil  
Marcelo Okano, Professor, CEETEPS, Brazil

Banking technology means innovation and modernity when it comes to mobile applications. Undoubtedly, banks benefit greatly from Information Systems, but they have also become susceptible to a greater risk, which may include disruption of critical processes. This article analyzes the different types of risk in the mobile bank.

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**073-1675**  
**An Empirical Assessment of Supply Chain Risks in the Petroleum Industry of Ghana**  
Charles Amoatey, Lecturer, GIIMA, Ghana  
Kwasi Amoako-Gyampah, Professor, University of North Carolina Greensboro, United States  
Samuel Famiyeh, Senior Lecturer, GIIMA, Ghana  
Ebenezer Addaku, Senior Lecturer, GIIMA, Ghana

The paper identifies the critical supply chain risks that plague the downstream petroleum supply chain in Ghana. It identifies and analyses the extent and severity of risk exposures on key players along the supply chain. Appropriate mitigation measure were suggested.

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**073-1125**  
**The Effects of Global Supply Chain Disruptions on Companies’ Market Performance**  
Hugo Lam, Student, The Hong Kong Polytechnic University, Hong Kong  
Li Ding, Student, Hong Kong Polytechnic Univ, Hong Kong  
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China  
Honggeng Zhou, Professor, Zhejiang University, China

This paper investigates the effect of Japanese earthquake on Chinese publicly traded firms’ financial performance with event study method. We also test the moderating effect of commonly identified variables. Our study complements the scarce quantitative studies of the global impact of supply chain disruptions and provides some managerial implications.

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**073-1724**  
**Critical Food Safety Risk Events in the Brazilian Milk Chain: Preliminary Data**  
Danielle Pozzo, Student, Pontifical Catholic University of Rio Grande Do Sul, Brazil  
Peter Hansen, Associate Professor, Pontifical Catholic University of Rio Grande Do Sul, Brazil

This study aims to identify the critical food safety risk events in the brazilian milk chain. The first phase - already conducted - consisted of an exploratory study. Academic researchers and practitioners’ interviews as well as secondary data were integrated for data analysis.

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**073-1723**  
**Estimation Viability of C2C as a Metrics for Supply Chain Performance**  
Seock Hong, Assistant Professor, University of North Texas, United States  
Hossein Najmi, Student, University of North Texas, United States

In this paper, the Cash-to-Cash cycle time (C2C) and financial performance metrics of seven selected industries are investigated with data taken from their annual reports from 2008 to 2012. The purpose of this paper is to study C2C whether it is appropriate to measure supply chain performance or not.

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**073-2047**  
**The Value of Price-Adjustment (Surge-Pricing) for Competing Retailers in Presence of Supply Disruption**  
Milan Kumar, Student, Indian Institute of Management Calcatta, India

Supply disruption has become a critical concern for businesses around the world. We study how retailers can use pricing decisions with sourcing strategies under disruption risk while competing against another retailer with reliable supply chain. We further study the value of price-adjustment for retailers in case of supply disruption.

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**073-0998**  
**Consumer Learning of Product Quality with Time Delay: Insights from Spatial Price Equilibrium Models**  
Dong Li, Assistant Professor, Arkansas State University, United States  
Anna Nagurney, Professor, University of Massachusetts Amherst, United States  
Min Yu, Assistant Professor, University of Portland, United States

SPE network models under perfect quality information and under quality information asymmetry with consumer learning of product quality are presented, along with a measure of the value of perfect quality information. The models are especially relevant to agricultural products where SPE models have found wide application.
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<th>Session</th>
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<td>500</td>
<td>Production Scheduling</td>
<td>Si Zhang</td>
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<tr>
<td>073-0361</td>
<td>A Hybrid Heuristic Approach to Minimize Number of Tardy Jobs in Group Technology Systems</td>
<td>Ahmad Bajwa, Assistant Professor, University of Arkansas, United States</td>
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<td>Sharif Melouk, Associate Professor, University of Alabama Tuscaloosa, United States</td>
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<td>We consider scheduling jobs on a single machine in group technology system with the objective of minimizing number of tardy jobs without preemption. To solve this NP-hard problem, we develop a hybrid heuristic based on GRASP &amp; PSO meta-heuristics. The hybrid heuristic finds optimal solutions for 63% of problem instances.</td>
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<tr>
<td>073-1793</td>
<td>Order Acceptance and Scheduling Decisions in Manufacturing</td>
<td>Bobin Cherian Jos, Student, Indian Institute of Technology Madras, India</td>
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<td>Rajendra Chandrasekharan, Professor, Indian Institute of Technology Madras, India</td>
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<td>We study simultaneous order acceptance and scheduling decisions in a manufacturing environment consists of non-identical parallel machines. We are addressing this in a deterministic scenario with due date, processing time and revenue. We present an MILP model for the problem and review the various solution approaches available.</td>
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<tr>
<td>073-1062</td>
<td>Improving the Efficiency of Solving Scheduling Problems in Flexible Manufacturing System by Using Multi-Fidelity Optimization</td>
<td>Si Zhang, Associate Professor, School of Management, China</td>
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<td>The scheduling problems in flexible manufacturing system are usually large-scale optimization problems. In this work, we integrate the approach of multi-fidelity optimization, named as Multi-fidelity Optimization with Ordinal Transformation and Optimal Sampling (MO2TOS), with Particle Swarm Optimization (PSO) to improving the efficiency of solving the scheduling problems.</td>
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<tr>
<td>073-0256</td>
<td>The Impact of Advance Selling And Quality Disclosure On Sales Strategy For Perishable Products</td>
<td>Yuan Jiang, Student, Huazhong University of Science &amp; Technology, China</td>
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<td>Shihua Ma, Professor, Huazhong University of Science &amp; Technology, China</td>
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<td>The effect of advance-selling and quality disclosure strategies was investigated in a supply chain with only asymmetric product quality information. Advance-selling greatly improved the whole profit, while quality disclosure was detrimental to retailer’s profit. Only when disclosure cost was below a certain threshold would the manufacturer prefer quality disclosure.</td>
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<tr>
<td>073-0451</td>
<td>Comparison of Quality Incentive Strategies for a Second-Tier Supplier</td>
<td>SEUNG HO YOO, Associate Professor, Sunmoon University, Korea, Republic of (South Korea)</td>
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<td>We introduce possible incentive strategies to enhance a second-tier supplier's quality in a three-stage supply chain, such as an incentive based on a quality target, a subsidy for quality investment and a reward based on market performance. Then, we reveal their unique characteristics by comparing their overall performances.</td>
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<tr>
<td>073-1676</td>
<td>Performance Interactions in Sustainable Supply Chain Management Framework: A Literature Review</td>
<td>Hee Yoon Kwon, Student, College of Business Administration, United States</td>
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<td>Gawon Yun, Student, University of Rhode Island, United States</td>
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<td>Mehmet Yalcin, Student, University of Rhode Island, United States</td>
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<td>Douglas Hales, Professor, University of Rhode Island, United States</td>
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<td>This paper evaluates the research conducted among the interactions suggested in the seminal Carter &amp; Rogers (2008) sustainability framework. In doing so this study suggests future interaction into the interactions that create model dynamics. We find that research on environmental-social performance interaction should be encouraged.</td>
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<tr>
<td>073-1358</td>
<td>Green Supply Chain: Deciphering the Gap between Theory and Practice</td>
<td>Abhishek Vashishth, Student, Indian Institute of Management, Tiruchirappalli, India</td>
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<td>Ayon Chakraborty, Assistant Professor, Indian Institute of Management, Tiruchirappalli, India</td>
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<td>In this study we highlight the gap between desirability of green supply chain activity in theory and its slow implementation at aggregate level across firms. We explore and report possible reasons with an interdisciplinary approach aimed towards providing a road-map for bridging this gap.</td>
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<tr>
<td>073-0524</td>
<td>Public Reactions to Supply Chain Glitches - A Twitter Sentiment Analysis</td>
<td>Christoph Schmidt, Student, Ebs Business School, Germany</td>
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<td>David Wuttke, Lecturer, Ebs Business School, Germany</td>
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<td>H. Sebastian Heese, Professor, North Carolina State University, United States</td>
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<td>In order to evaluate public reaction to supply chain glitches we conduct sentiment analysis on Twitter data of about 80 companies. Attribution Theory is applied to examine factors driving attention and sentiment shifts.</td>
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<tr>
<td>073-0859</td>
<td>Design of a Resilient Hazardous Material Network Considering Perishability</td>
<td>Behzad Zahiri, Student, Suny At Buffalo, United States</td>
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<td>Jurriaan de Jong, Assistant Professor, Suny At Buffalo, United States</td>
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In this study, we present a new mathematical model to address the hazardous material transportation design with respect to perishability and resiliency. The proposed problem is modeled as a bi-objective mixed-integer non-linear programming model that seeks to minimize total cost and risk with built-in de-resiliency measures in the network.

Managing Ambiguities Associated with Supply Chain Disruption Onset And Discovery: An Empirical Analysis
Rahul Pandey, Student, Ohio State University, United States
Dipanjan Chatterjee, Associate Professor, Brock University, Canada
Johnny Rungtusanatham, Professor, Old Dominion University, United States

Supply chain disruptions (SCDs) onset and discovery are fraught with ambiguities: trigger anticipation ambiguity and loss scoping ambiguity. Employing a sample of 206 manufacturing firms, we find that ties with supply-base and ties within supply-base are negatively associated with SCD ambiguities. Furthermore, SCD ambiguities are negatively associated with firm performance.

An Operational Formulation of the Supply Network Resilience Concept Using Simulation Based Experiments
Yaneth Correa-Martinez, Assistant Professor, Colorado State University Pueblo, United States
Mamadou Seck, Assistant Professor, Old Dominion University, United States

This research explores an operational formulation of the concept of resilience of a supply network as a function of its structure, using an Agent Based Model and simulation experiments. The research also evaluates how different supply network structures and operational decisions give rise to resilience under network disruptions.

Maximizing Ridership in Bike Sharing Systems Using Empirical Data and Stochastic Models
Pradeep Pendem, Student, Kenan Flagler Business School, United States
Vinayak Deshpande, Professor, University of North Carolina Chapel Hill, United States

We analyze optimal allocation of bikes in network of stations to improve ridership under non-stationary demand and station substitution. We utilize large data sets on trips, real time inventory information and distance between stations to estimate true demand. Our study provides insights on the relationship between bike allocation and ridership.

Reducing GHG Emissions From Container Shipping: A Panel Data Analysis
Michele Acciaro, Associate Professor, Kuehne Logistics University, Germany
Alan McKinno, Professor, Kuehne Logistics University, Germany

This research analyses panel data on Greenhouse Gas (GHG) emissions in international container shipping. Results show that although reductions up to 15% have been achieved in some years, this is unlikely to repeat in the future. A regulatory response as well as further industry collaborations are necessary.

Incentives for Low-Carbon Technology Adoption in the Presence of Learning Among Heterogeneous Firms
Jaewoong Lee, Student, KAIST College of Business, Korea, Republic of (South Korea)
Jyong Eom, Associate Professor, Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of (South Korea)

Carbon policy that promotes diffusion of low-carbon technologies can be improved by taking firm heterogeneity and industry-level learning into account. Based on a two-stage model, we characterize the firms’ inter-temporal technology choice and operational decisions and demonstrate how the optimal carbon policy schedule would differ from the conventional one.

Buyer-Supplier Relationships: A Systematic Analysis of the Literature’s Knowledge Structure and Its Future Scope
Anton Wetzstein, Student, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany
WC Benton, Professor, Ohio State University, United States
Evi Hartmann, Professor, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

This mixed-method study conducts a citation-based meta-examination of 416 papers. Employing tools such as the Louvain algorithm we analytically identify key contributions and find seven research clusters. The purpose is to assist scholars in positioning BSR research and to identify recommendations for future research in this highly relevant research field.

Buyer-Supplier Relations and Supplier Compensations for Price Concessions
Sengun Yeniyurt, Associate Professor, Rutgers University, United States
Steven Carnovale, Assistant Professor, Portland State University, United States
John Henke, Emeritus Professor, Oakland University, United States

Evaluation of 1,646 buying situations across seven years of a longitudinal panel dataset collected from Tier 1 production suppliers found that suppliers compensate for price concessions given by reducing product quality, service support, and R&D expenditures. Buyers can alleviate this by building good working relations with the suppliers.

The Roles of Managerial Knowledge Transfer Activities in Improving Suppliers’ Performance
Daesik Hur, Associate Professor, Yonsei University, Korea, Republic of (South Korea)
This study suggests a buyer firm’s managerial knowledge transfer activities as an important yet unexplored dimension of supplier development activities, and posits that these activities will improve a supplier’s strategic as well as operational performance through relational asset accumulation. Hierarchical linear modeling (HLM) methodology is employed for empirical analysis.

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<th>505</th>
<th>Monday, 08:00 AM - 09:30 AM, Grand C</th>
<th>Track: Empirical Research in Operations Management</th>
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<tbody>
<tr>
<td>Chair(s):</td>
<td>Ebenezer Adaku</td>
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<tr>
<td>073-0750</td>
<td>Influence of Political Environment on Foreign Firms’ Operations Strategy: Empirical Evidence from China</td>
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<tr>
<td>Remi Charpin, Student, Clemson University, United States</td>
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<tr>
<td>Erin Powell, Assistant Professor, Clemson University, United States</td>
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<td>Aleda Roth, Professor, Clemson University, United States</td>
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Firms are greatly influenced by their political environment when it comes to strategic decision-making. Less is known about the influence of this political environment on firms’ operations and supply chain decisions. We present results from a grounded theory-based qualitative study with foreign managers in China.

<table>
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<th>506</th>
<th>Monday, 08:00 AM - 09:30 AM, Grand E</th>
<th>Track: Behavior in Operations Management</th>
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<tr>
<td>Chair(s):</td>
<td>Drew Stapleton</td>
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<tr>
<td>073-0090</td>
<td>Continuous Improvement Practice in Iowa and Ireland</td>
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<tr>
<td>Daniel Bumbalaukas, Assistant Professor, University of Northern Iowa, United States</td>
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<tr>
<td>Brad Meyer, Associate Professor, Drake University, United States</td>
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<td>Richard Keegan, Manager Competitiveness Department, Enterprise Ireland, Ireland</td>
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New research based on an experimental study originally presented at POMS 2015 in Washington DC. Data was collected from numerous companies across various industry segments with a refined survey instrument to analyze continuous improvement projects across Ireland and Iowa to provide more comprehensive results as compared to 2015.

<table>
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<tr>
<th>507</th>
<th>Monday, 08:00 AM - 09:30 AM, Grand F</th>
<th>Track: Global Supply Chain Management</th>
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<tbody>
<tr>
<td>Chair(s):</td>
<td>Ozgu Turgut</td>
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<tr>
<td>073-0600</td>
<td>Impact of Tax on a Manufacturing Firm's Strategic Decision of Selling to a Rival</td>
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<tr>
<td>Vernon Hsu, Professor, Chinese Univ of Hong Kong, Hong Kong</td>
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<td>Wenqiang Xiao, Associate Professor, New York University, United States</td>
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<tr>
<td>Jiayin Xu, Student, Chinese Univ of Hong Kong, Hong Kong</td>
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</table>

We consider a multinational firm who faces the decision of whether to sell inputs used by its internal division to an external rival. We show that the consideration of tax has significant impact on the outcomes of sale or no sale between the two rivals.
073-0699 The Effects of International Tax Policy on Firms' Production Outsourcing Strategies
Guoming Lai, University of Texas Austin, United States
Yixuan Liu, Student, University of Texas Austin, United States
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China
We study the effects of international tax policy on firms' production outsourcing strategies. We reveal the operational inefficiencies that can be caused by the current US tax deferral system and we then discuss the implications of a frequently raised tax reform proposal.

073-0929 Tax and Duty Cost Based Network Optimization
Ozgu Turgut, Assistant Professor, Massachusetts Institute of Technology, United States
Tax and duty costs are more than half of the total supply chain expenses in global market. In this study, we are aiming at developing insight about the optimization methods of a network model which contains realistic tax and duty cost calculations of the most generic form.

508 Monday, 08:00 AM - 09:30 AM, Grand G
Session: Closed-loop Supply Chain Design
Chair(s): Gemma Berenguer

073-0017 A Joint Pricing-Location-Inventory Problem Considering Market Cannibalization
Yanzi Zhang, Student, Tsinghua University, China
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China
This paper studies a joint location-inventory-pricing problem with cannibalization effect of new products sales by remanufactured products. The problem is modeled as a nonlinear mixed integer program. Extensive numerical experiments demonstrate the effects of market cannibalization on the supply chain network design and operations.

073-0954 Returns Management in an Omni-Channel Retailing Environment under Time-Value Considerations
Sung Ook, PhD Student, Texas A&M University College Station, United States
Halit Uster, Associate Professor, Southern Methodist University, United States
Canan Savaskan, Associate Professor, Southern Methodist University, United States
For commercial product returns, we study returns management with multiple reverse channels in the recovery logistics network. We develop a mathematical model that captures the decisions on how the returned products should be handled for efficient recovery that would maximize the total profit over a planning horizon.

073-1880 Channel Coordination in Reverse Supply Chains
Sila Celinkaya, Professor, Southern Methodist University, United States
Yi Zhang, Senior Business Analyst, Maxim Integrated, United States
Elif Akcak, Associate Professor, University of Florida, United States
We study a channel coordination problem arising in the context of a reverse supply chain comprised of a collector and a remanufacturer. We propose and investigate effective coordination mechanisms under general return processes. We also investigate the coordination mechanisms for some specific classes of return processes.

073-1663 Testing, Location and Inventory Decisions in the Design of Closed-Loop Supply Chains
Gemma Berenguer, Assistant Professor, Purdue University, United States
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China
We study location, inventory, and testing decisions in closed-loop supply chain design with stochastic demands of new and time-sensitive returned products. This analysis strikes a balance between responding to different industry-wide questions and assisting our partnering firm, a Chinese manufacturer of multimedia products.

509 Monday, 08:00 AM - 09:30 AM, Grand I
Session: Entry and Exit in Retailing
Chair(s): Stanley Lim

073-0568 (Un)Intended Consequences of Retail Store Openings: An Analysis of Costco's Market Entries in the U.S.
Stanley Lim, Student, University of Cambridge, United States
Elliot Rabinoivich, Professor, Arizona State University Tempe, United States
Sungho Park, Associate Professor, Arizona State University Tempe, United States
We use quasi-natural experiment to examine the impact on household demand, travel expenditures and environmental externalities caused by Costco’s entry to a variety of markets in the U.S. Moreover, we estimate monetary values assigned by households to different purchase benefits and travel costs associated with Costco's entry to these markets.

073-1225 Determining the Value of Local Showrooms to Online Competitors from Consumer Search and Purchase
Jayarajan Samuel, Student, University of Texas Dallas, United States
Ying Xie, Associate Professor, University of Texas Dallas, United States
Eric Zheng, Professor, University of Texas Dallas, United States
Using a unique dataset of online purchases and an exogenous showroom closure event we study the value of a local showroom. By a difference in difference approach we examine the change in sales and search intensity when a showroom closes. Finally, we conclude with implications to online and offline retailers.

073-0960 Adding Bricks to Clicks: Self-Operated or Franchised?
Chenhuizi Wang, Student, Peking University, China
Shuxiao Sun, Student, Peking University, China
Xiaona Zheng, Associate Professor, Peking University, China
We conclude the online sales with offline showroom and a final approach implications to retailers.
Since consumers prefer to experience the merchandise, online sellers are adding bricks (self-operated or franchised) to clicks. We construct a game-theoretic model to examine the alternatives. We find that the degree of showcase effect and the seller's efficiency determines whether a self-operated or franchised offline store should be adopted.

**510**  
Monday, 08:00 AM - 09:30 AM, Grand J  
**Track:** Humanitarian Operations and Crisis Management  
**Session:** Emergency Logistics and Operational Preparedness for Weather-Related Disasters - 3  
**Chair(s):** Rob Cook

**073-0938**  
A Framework for Outsourcing in Humanitarian Logistics  
Timo Gossler, Student, Vienna Univ of Econ & Business Admin, Austria  
Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria

Based on a review of current literature we develop a decision framework for outsourcing of humanitarian logistics processes. The framework structures the multitude of potential outsourcing engagements and provides criteria for selecting the appropriate form of outsourcing. It can be used by humanitarian organizations to guide their make-or-buy decision.

**073-0964**  
Supply Chain Considerations for Humanitarian Projects in Weather-Related Disasters  
Alain Vaillancourt, Assistant Professor, Jönköping International Business School, Sweden

Every year, vulnerable people become victims of weather-related disasters. These disasters and their negative outcomes will become ubiquitous with the combination of global warming and growing population. This paper explores the supply chain considerations behind immediate response planning by aid agencies for major weather-related disasters.

**073-1552**  
Explaining the Failure to Prevent Disaster  
Willard Price, Emeritus Professor, University of Pacific, United States

Much attention is paid to disaster response, reacting to a system collapse/breakdown and disastrous consequences. Assuming "failure to prevent" disaster is an "irrational choice", this research uses an explanatory model to synthesize ten cases, leading to recommendations for preventing rather than responding to unacceptable impacts caused by human/natural events.

**073-1578**  
Dispatching Policies for Relief Distribution with Stochastic Supply and Demand  
Robert Cook, Student, University of Alabama Tuscaloosa, United States  
Emmett Lodree, Associate Professor, University of Alabama Tuscaloosa, United States

This study introduces a Markov decision process (MDP) model for collecting donations and distributing them to disaster survivors. Donations that accumulate over time at collection sites are periodically transported to a relief center where they are distributed to beneficiaries. The MDP model minimizes expected unsatisfied demand during a finite horizon.

**511**  
Monday, 08:00 AM - 09:30 AM, Grand K  
**Track:** Humanitarian Operations and Crisis Management  
**Session:** Organizational Issues in HOCM - 2  
**Chair(s):** Matthieu LAURAS

**073-1546**  
Collaboration in humanitarian operation: Huge challenges for the humanitarian workers  
Renata Silva, Student, Fundacao Getulio Vargas, Brazil  
Marlei Pozzebon, Professor, HEC Montreal, Canada

This works goal is to understand how the types and phases of projects in the humanitarian sector influence the collaboration between international NGOs and local organizations. 30 interviews were conducted with humanitarian workers. Challenges that hindered the collaboration by the humanitarian were related to principals, time restraints and context.

**073-1767**  
Leading Local and Expatriate Humanitarian Aid Workers in the Field: A Case For Intergroup Leadership  
Mojtaba Salem, Student, Kuehne Logistics University, Germany  
Maria Basiou, Professor, Kuehne Logistics University, Germany  
Niels Van Waquebeke, Professor, Kuehne Logistics University, Germany  
Louisa Meyer, Aid Worker, Kuehne Logistics University, Germany

Using data from 125 aid workers, we study and empirically support that leaders can improve effectiveness and efficiency of humanitarian operations via integrating technical and contextual insights that diverse teams bring into field offices. Specifically, we consider how leaders build cooperation between expatriate and local staff inside a field office.

**073-1900**  
Towards a Sustainable Humanitarian Supply Chain: Planning Sustainable Tactical Humanitarian Operations  
Laura Laguna Salvado, Student, Mines Albi, France  
Matthieu Lauras, Associate Professor, Mines Albi, France  
Tina Comes, Professor, University of Agder, Norway  
Frederick BENABEN, Professor, Toulouse University, Mines Albi, Industrial Engineering Center, France

Sustainability is becoming part of the strategic plan of HSC. However, practitioners do not have the tools to consider it on the tactical level. Thus, we discuss the definition of sustainable performance indicators aligned with humanitarian objectives, and we suggest an optimization approach to plan HSC sustainable operations.

**518**  
Monday, 08:00 AM - 09:30 AM, Cedar A  
**Track:** Product Innovation and Technology Management  
**Session:** Technology Commercialization and Adoption  
**Chair(s):** Shadi Goodarzi

**073-1818**  
Measuring Innovation in Manufacturing with an Index  
Anand Kandaswamy, Economist, NIST, United States  
Douglas Thomas, Economist, NIST, United States
Monday, 08:00 AM - 09:30 AM

Manufacturing advances are driven by innovation diffusion. Current diffusion research does not explain the key drivers of manufacturing-specific innovation. To remedy this, the authors have developed a diffusion index that examines factors like patent applications and change in market size to explain the key drivers of manufacturing innovation.

073-1677  Technological Discontinuity and Market Competition in the Mobile Service Industry
Xiahua Wei, Assistant Professor, University of Washington, United States

We study how technological discontinuity contributes to market competition in the mobile service industry. Based on a firm-level panel dataset, we examine whether the ability of new entrants to disrupt incumbents depends on the responsiveness of incumbents to new technologies, and whether technological discontinuities by incumbents can delay industry shakeouts.

073-2076  Bitcoin Digital Divide
Hemang Subramanian, Professor, Florida International University, United States
Karlene Cousins, Assistant Professor, Florida International University, United States
Pouyan Zadeh, Lecturer, Florida International University, United States

Using a qualitative multi-modal study that uses text mining of forum comments, focus group interviews and longitudinal surveys, we examine the digital divide with respect to Bitcoin adoption in society. Our results help inform scholars and practitioners regarding both drivers and blockers for adoption, while recommending remediation measures.

073-0687  Time Value of Different Information: Dimensions on Environmental Technology Adoption
Shadi Goodarzi, Assistant Professor, Mihaylo College of Business and Economics, United States
Andrea Masini, Associate Professor, Hec Paris, France
Sam Afifi, Assistant Professor, Hec Paris, France

We empirically examine the time-dependent impact of different types and channels of information on both the intention to adopt a photovoltaic system and the actual adoption decision. The findings have important implications for both policy making and for technology manufacturing companies that need to optimize their marketing strategy and distribution.

073-1040  Windows of Acceleration and Disconformity: Competitive Reaction to Technological Innovation
Hyunwoo Park, Lecturer, Georgia Institute of Technology, United States
Rahul Basole, Associate Professor, Georgia Institute of Technology, United States

We study the impact of dominant design in sequential product categories on product innovation using a dyadic perspective in the context of mobile phone industry. Our results indicate that dominant design accelerates incremental product innovation and causes temporary adverse shift in product category focus.

Young Sik Cho, Assistant Professor, Jackson State University, United States
Kevin Linderman, Professor, University of Minnesota, United States
Xiaosong (David) Peng, Associate Professor, University of Houston, United States

A firm’s innovation activities are recognized as not only a primary driving force of competitive advantage but also a significant cause of competitive disruption. This study argues the limitations of current PLC-based innovation models, and empirically investigates how to optimize a firm’s product and process innovations based on the RBV.

073-0868  Factor That Influence Innovation in Brazilian Enterprises
Paulo Oliveira, Professor, Universidade Anhembi Morumbi, Brazil
Luciano Silva, Associate Professor, Universidade Nove De Julho, Brazil
Dirceu Silva, Professor, Universidade Nove De Julho, Brazil
Maria Tecilla, Student, FMU - Faculdades Metropolitanas Unidas, Brazil
Roberta de Barros, Student, FMU - Faculdades Metropolitanas Unidas, Brazil

This paper aims to create a factor model about innovation in Brazilian Enterprises and in which way this happens to improve operations and create new products. To achieve this objective the authors mapped the type of innovation the Brazilian enterprises prefer and how they use this innovation during the operations.

073-1395  Adoption of Collaborative Container Logistics Information Systems Under Benefits Redistribution
Rob Zuidwijk, Professor, Rotterdam School of Management, Netherlands
Irina Romochkina, Student, Rotterdam School of Management, Netherlands
Peter Baalen, van, Professor, Universiteit van Amsterdam, Netherlands

This paper draws from cooperative game theory and is inspired by actual issues in the adoption of Inter-Organizational Systems in container logistics in a sea port environment. While considering the redistribution of benefits using Shapley value, we study the influence of network effect and network structure on system adoption.

073-1356  A Framework to Implementations of Decision Supports System in Production, Planning and Control Departments
Ricardo Delle Piagge, Student, Universidade Federal de São Carlos, Brazil
José Henrique de Andrade, Professor, Instituto Federal de São Carlos, Brazil
Paulo Politano, Associate Professor, Universidade Federal de São Carlos, Brazil
The use of decision support systems (DSS) in production, planning, and control (PPC) has been growing rapidly. The goal of this work was building a framework of DSS implementations in PPC. Therefore, a literature review was conducted and five case studies and an action research, developing and validating the framework.

### 073-0843 Platform Pricing and Investment to Drive Third Party Value Creation in Two-Sided Networks
Burcu Tan Erciyes, Assistant Professor, Tulane University, United States
Edward Anderson, Professor, University of Texas Austin, United States
Geoffrey Parker, Professor, Dartmouth College, United States

Many two-sided platforms provide integration tools such as APIs to reduce the costs and improve the functionality of third-party content developed for the platform. We develop an analytic model to explore the key trade-offs behind investment in integration tools and how that investment interacts with two-sided pricing decisions.

### 073-1243 The Missing Link - Manufacturing Execution Systems Adoption: Performance Impacts and Contextual Drivers
Nicolas Brune, Student, RWTH Aachen University, Germany
David Bendig, Assistant Professor, RWTH Aachen University, Germany
Malte Brettel, Professor, RWTH Aachen University, Germany

Linking enterprise and shop-floor level, Manufacturing Execution Systems (MES) form part of the digital thread, an enabler for smart manufacturing and analytics applications. Using an event study we investigate the effect of MES adoption on operating performance and explain the impact of industry dynamics and prior slack on this relationship.

### 073-2023 Implications of a Negative Market Spillover
Jeffrey Shulman, Associate Professor, University of Washington, United States
Amir Fazli, Student, University of Washington, United States

Recently firms have decided to withdraw from profitable unhealthy good markets, believing the move will benefit their overall business. We build a model of two competing firms to examine how firms react to a negative market spillover and find conditions under which different firms exit the unhealthy good market.

### 073-2021 Real-Time Bidding in Online Display Advertising
Amin Sayedi, Assistant Professor, University of Washington, United States

In recent years, a growing number of impressions in display advertising are being sold in real-time bidding (RTB). In this paper, we use a game theory model with two advertisers and a publisher to study the effects of RTB on advertisers' and publishers' strategies and their profits.

### 073-2020 Conspicuous Consumption on the Long Tail: How Can Luxury Brands Benefit From Counterfeits?
Pinar Yildirim, Assistant Professor, University of Pennsylvania, United States
Zhenqi Liu, Student, University of Pennsylvania, United States
John Zhang, Professor, University of Pennsylvania, United States

We study how luxury brands can use product line expansion as a strategy when facing a threat from the counterfeit market. Our findings suggest that product line expansion strategy serves the high-end status-conscious consumers and their motives to strengthen their status image.

### 073-2022 The Effects of Autoscaling in Cloud Computing on Entrepreneurship
Amir Fazli, Student, University of Washington, United States
Amin Sayedi, Assistant Professor, University of Washington, United States
Jeffrey Shulman, Associate Professor, University of Washington, United States

We build a game theory model to examine how a recent innovation in cloud computing known as autoscaling, which allows companies to automatically scale their computational load up or down as needed, will affect entrepreneurs’ decisions to enter a new market.

### 073-1273 Social Media and Consumption Of Teenage Women: The Case of Flatform Sandals
Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
Millena Calixto, Student, Faculdade Santo Agostinho, Brazil

This research had as objective to understand the influence of social media on the consumption of sandals by adolescent women. The results showed that industries should include this marketing communication in their operations management due to the high capacity of penetration in adolescent women using nostalgic elements in this communication.

### 073-0475 Multi-Period Pricing in the Presence of Competition and Social Influence
Shuxiao Sun, Student, Peking University, China
Xiaona Zheng, Associate Professor, Peking University, China

This paper examines competing firms' pricing decisions over two periods in the presence of social influence. We find that social influence may lead firms to set prices below marginal costs. When social influence is not significant, dynamic pricing dominates fixed pricing. We extend the model to multiple periods.

### 073-1945 Pricing in Social Networks With Strategic Consumers
Biying Shou, Assistant Professor, City University of Hong Kong, Hong Kong
Rui Zheng, Student, City University of Hong Kong, Hong Kong
We analyze a two-period pricing problem in social networks with strategic consumers. Consumers who purchase in the second period can gain positive network externality from her neighbors who have purchased in the first period. We derive the equilibrium prices under general social network structures and show some interesting properties.

**073-1123** Comparison Between AON and KIA Mechanisms in Crowdfunding  
Lei Guan, Assistant Professor, Beijing Institute of Technology, China

In this research, we compare the seller's pricing strategy between AON and KIA mechanisms in crowdfunding based on Hu et al. (2014). Our model also includes the scenario that the seller only keeps part of the money that supports paid.

**073-0650** Short vs. Long-Term Procurement Contracts When Supplier Can Invest In Cost Reduction  
Aadhaar Chaturvedi, Assistant Professor, University of Namur, Belgium  
Gilles Merckx, Student, University of Namur, Belgium

We first investigate the effect of supply base size on buyer's decision on contract length when incumbent supplier can invest in production cost improvement. We then investigate how supplier discrimination can resolve the tension between selecting a short-term or a long-term contract.

**073-0161** The Adoption Time of Production Commonality When Consumers Are Deliberate  
He Xu, Professor, Huazhong University of Science & Technology, China  
Pin Zhou, Student, Huazhong University of Science & Technology, China

In this paper we study the impact of commonality strategy and consumer deliberation on the optimal product line design in multiple quality attributes. When the firm adopts the commonality strategy to maximize the profits ,there is a trade off between cost savings and product differentiation(i.e.cost-reduction effect and cannibalization effect).

**073-1305** Optimizing of Expected Profit of Retail Products Sale  
Shradha Gawankar, Assistant Professor, University of Richmond, United States

We consider the problem of determining the expected profit for a quantity by considering a three products case. The formulation is carried out to maximize the objective function and it has been analyzed using Matlab. Our procedure helps to handle demand and supply control and stock out situations optimally.

**073-1654** Strategic Provision of Inventory Information Under Competition  
Kate Ashley, Assistant Professor, Montclair State University, United States

Firms in many industries provide customers with real-time inventory availability information, which is typically unverifiable by consumers. We use a game-theoretic model to characterize the information provision strategies that emerge in equilibrium when two firms compete and both customers and firms act strategically in sending and interpreting messages.

**073-0631** A Principal-Agent Problem with Heterogeneous Demand Distributions  
Welbo Cai, Assistant Professor, New Jersey Inst of Technology, United States  
Dashi Singham, Assistant Professor, Naval Postgraduate School, United States

We study the implications of uncertainty in agents’ demands on a principal’s contracts. We present analytical solutions for the special case when there are two distributions, as well as a method for deriving analytical solutions from numerical solutions. Carbon capture and storage systems provide a motivating example for this problem.

**073-1229** Taxi Services in a Large Metropolis: Gig Economy Influences and Implications  
Orlando Cattini Junior, Associate Professor, Fundacao Getulio Vargas, Brazil  
Andrea Vilas Boas, Student, Fundacao Getulio Vargas, Brazil

Identification of the new personal value by customers and taxi drivers due to the inclusion in the gig economy of taxi services provider companies in Sao Paulo with the use of mobile apps. Among the 35,000 taxi drivers in the city, 30,000 chose to use these applications.

**073-1454** A Human Resource Management and Quality Assurance Risk Management Approach Among Honduran Service Manufacturing  
Cesar Ortega, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras  
Jesus Argueta, Professor, National University Autonomous of Honduras, Honduras  
Taria Andino Ruiz, Student, UNIVERSIDAD NACIONAL AUTONOMA HONDURAS, Honduras

The present study intends to provide diagnose from the Honduran context characteristics, that trigger certain risks appearance and thereby condition the Human Resource Management and Quality Assurance conditions. It is worth mentioning that these analysis represents the first stage of an overall investigation, by studying the Honduran Hotel Industry.

**073-1143** Value Co-Creation in Service Innovation: A Process Perspective  
Qiang Wang, Assistant Professor, Xi'an Jiaotong University, China  
Xiande Zhao, Professor, China Europe International Business School, China

This research proposes a theoretical model to study the value co-creation activities among service providers, their business partners, and customers in different stages of the service innovation process including idea generation, development, and launch and deployment. Empirical data were collected from 200 innovation projects and structural equation modeling was used.

**073-1789** Product Support Forums: Customers as Partners in the Service Delivery  
Konstantinos Stouras, Student, The Darden School, University of Virginia, United States
## 073-0955 Dynamic Stackelberg Multi-Agent Transient Analysis of Food Grain Public Distribution System

Sankaranarayanan Gopalan, Student, IIT-KGP, India
Sri Krishna Kumar, Assistant Professor, Indian Institute of Technology Kharagpur, India
Manoj Tiwari, Professor, Indian Institute of Technology Kharagpur, India

An Evolutionary Stackelberg Multiagent analysis of the inbound section of a Food grain Supply Chain under transient conditions due to changes in policies and other associated factors are modelled. The strategy profiles of various stakeholders are considered for decision making for better forecasting of procurement.

## 073-1925 Competitive Environment and Investment Decision Effects on Firm Competitive Position and Performance

Flávia Rossi, Student, Fumec University, Brazil
Alexandre Dias, Professor, Fumec University, Brazil
Julia De-Carvalho, Student, Fundacao Getulio Vargas, Brazil

The paper approaches the competitive environment and investment decision effects on American manufacturing industry firms competitive position and performance under the Industrial Organization Theory point of view. The results of partial least squares structural equations modelling point out to effects of different strengths before and after the 2008 default crisis.

## 073-0439 Railways Meta-Analysis: A Literature Systematic Review of the Mean Efficiency of the Systems

Dalmó Marchetti, Student, Federal University of Rio De Janeiro, Brazil
Peter Wanke, Associate Professor, Federal University of Rio De Janeiro, Brazil

A meta-analysis of railways efficiency showed a significant difference between parametric and non-parametric models, but NDEA and DEA and panel data and cross-section structures have not differed significantly. Passengers and high speed systems got significantly higher results than cargo and Japan and US railways seemed to have features toward efficiency.

## 073-1206 Impact of Communities of Practice in Quality Improvement Initiatives in Supply Chain Management

Kiran Kumarawamy, Student, Indian Institute of Management Bangalore, India
Krishna Sundar Diattha, Professor, Indian Institute of Management Bangalore, India

Primary objective of this work is to understand the impact of Communities of Practice (CoP) activities on quality initiatives of firms in a competing environment. Taking a Game theoretic approach, we analyze the impact of CoP for symmetric firms. The implications for dominant and mildly dominant firms have been discussed.

## 073-0701 Producing Customized Cars: Meanings Associated With Car Consumption by People with Physical Disabilities

Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil

The objective was to understand the meanings associated with the consumption of automobiles by people with physical disabilities. The results demonstrate that: This consumer has difficulties in choosing the ideal model and little access to companies specialized in installing adaptations; How industries must produce these vehicles to reach these consumers.

## 073-0797 The Location Decision Revisited: Empirical Findings from the Automotive Sector

Ioannis Siskos, Student, Kuehne Logistics University, Germany
Matthias Holweg, Professor, University of Oxford, United Kingdom
Ann Vereecke, Professor, Vlerick Management School, Belgium
Luk Van Wassenhove, Professor, INSEAD, France

In this paper we empirically test location factors in the automotive context, using de facto location decisions car firms have taken, i.e Vehicle Manufacturing Plant (VMP) openings and closures. The main research question here is whether the location factors identified have the same effect in both VMP openings and closures.

## 073-1615 Multi-Job Production Systems

Pooya Alavian, Student, University of Michigan - Ann Arbor, United States
Peter Denno, Project leader, National Institute of Standards and Technology, United States
Semyon Meerkov, Professor, University of Michigan - Ann Arbor, United States

Multi-job production is a class of flexible manufacturing systems intended to produce different job-types according to a build-schedule. In MJP, job-types are processed by the same sequence of manufacturing operations, but with different cycle-times at some machines. We characterize MJP systems, analyze their performance, report an application in automotive industry.

## 073-0617 Automobile Consumption: Meanings Associated With Custom Production for the Elderly

Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
Talesa Viana, Student, Faculdade Santo Agostinho, Brazil
Francisco Freires, Associate Professor, Federal University of Bahia, Brazil
Acácio Silva Júnior, Associate Professor, Faculdade Mauricio de Nassau, Brazil

This paper analyzes the meanings associated to automobile consumption by people with disabilities, using the concept of Communities of Practice (CoP) and lessons from the automotive industry.
These are the abstracts of the presentations:  

**528 073-1570**  
**Session:** Revenue Management and Crowdfunding  
**Track:** Revenue Management and Pricing  
**Chair(s):** Soraya Fatehi  
**Examining Influential Factors of Hotel Revenue Management Sophistication**  
Lizao Zhang, Student, Washington State University Pullman, United States  
Xun Xu, Assistant Professor, California State University Stanislaus, United States  
Revenue management highly influences hotels’ financial performance. Our study designs a decision tree that measures the degree of hotel revenue management sophistication. Via empirical analysis, our study examines the influential factors of hotel revenue management sophistication. Implications for hotels to improve revenue management performance are provided.

**532 073-0160**  
**Session:** Inventory Management of Spare Parts and Perishables  
**Track:** Inventory Management  
**Chair(s):** Zheng Wang  
**Crowdfunding via Revenue-Sharing Contracts**  
Soraya Fatehi, Student, University of Washington, United States  
Michael R. Wagner, Professor, University of Washington, United States  
We analyze a new model of crowdfunding recently introduced by Bolstr and Localstake. In this model, a platform acts as a matchmaker between a firm needing funds and a crowd of investors willing to provide capital. Once the firm is funded, it pays back the investors using revenue sharing contracts.

**532 073-1392**  
**Session:** Inventory Management of Spare Parts and Perishables  
**Track:** Inventory Management  
**Chair(s):** Zheng Wang  
**Dynamic Expiration Dates for Perishables: An Application of Rfid-Enabled Information**  
Gary Gaukler, Associate Professor, Drucker School of Management, United States  
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States  
We describe an MDP-based inventory model to establish the value of a product's time and temperature history (TTH) for setting expiration dates based on known environmental conditions. We use the example of a supply chain for fresh packaged tomatoes to discuss the impact of TTH on costs and product freshness.

**532 073-1489**  
**Session:** Inventory Management of Spare Parts and Perishables  
**Track:** Inventory Management  
**Chair(s):** Zheng Wang  
**Can We Use Maintenance Plan to Improve Spare Parts Inventory Control?**  
Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands  
Sha Zhu, Student, Erasmus University Rotterdam, Netherlands  
Willem Jaarsveld, van, Assistant Professor, TU Eindhoven, Netherlands  
Preventive maintenance and inspections can be planned quite some time before execution. Yet the number of spare parts needed may depend on the actual state observed. We will show with real data that this information can be used to improve spare parts inventory control by comparing it with standard forecasting.

**532 073-0913**  
**Session:** Inventory Management of Spare Parts and Perishables  
**Track:** Inventory Management  
**Chair(s):** Zheng Wang  
**Temporary Replacements of Spare Parts Through Additive Manufacturing**  
Bram Westerweel, Student, Eindhoven University of Technology, Netherlands  
Rob Basten, Assistant Professor, Eindhoven University of Technology, Netherlands  
Geert-Jan van Houtum, Professor, Eindhoven University of Technology, Netherlands  
When spare parts have long supply lead times, equipment may experience high downtime costs during stockouts. We propose to use additive manufacturing, i.e., 3D printing, to supply temporary replacements. Analyzing the resulting model and using empirical data leads to interesting insights.

**532 073-0181**  
**Session:** Inventory Management of Spare Parts and Perishables  
**Track:** Inventory Management  
**Chair(s):** Zheng Wang  
**Integrated Ordering, Pricing and Freshness-Keeping Strategy for Perishable Products Under Inventory Inaccuracy**  
Zheng Wang, Professor, Southeast University, China  
Unlike pricing policy, freshness-keeping decision is seldom integrated with inventory control for perishable products. To fill this gap, we develop an integrated ordering, pricing and freshness-keeping strategy under inventory inaccuracy, which includes a switching-curve-based optimal policy for a single replenishment cycle and a POMDP-based policy iteration algorithm for infinite horizon.
<table>
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<tr>
<th>Session Time</th>
<th>Session Location</th>
<th>Chair(s)</th>
<th>Track</th>
<th>Session Title</th>
<th>Authors</th>
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<tr>
<td>Monday, 09:45 AM - 11:15 AM</td>
<td>Evergreen A</td>
<td>M Montazer</td>
<td>Healthcare Operations Management</td>
<td>The Vaccine Supply Chain - A Literature Review</td>
<td>Evelot Duijzer, Student, Erasmus University Rotterdam, Netherlands Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands Willem Jaarsveld, van, Assistant Professor, tu/e, Netherlands</td>
</tr>
<tr>
<td>Monday, 09:45 AM - 11:15 AM</td>
<td>Evergreen C</td>
<td>Marcelo Okano</td>
<td>Healthcare Analytics &amp; Medical Decision-Making</td>
<td>Development and Evaluation of A Model-Based Policy for Repeated Depression Screening</td>
<td>Haomiao Jin, Student, University of Southern California, United States Shinyi Wu, Associate Professor, University of Southern California, United States</td>
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We distinguish literature on vaccine logistics in four components: composition, production, allocation and distribution. Vaccine supply chains are characterized by high uncertainty in both supply and demand; asymmetry between supplier, public health organizations and end customer; complex decisions regarding allocation and deciding and acting in time.

In 1992, the accelerated approval pathway (AP) was instituted to speed up the development of new drugs but failed to be effective due to sponsors’ lack of incentives to complete post-market study. We propose the augmented user fee mechanism for inducing compliance on post-market study.

Healthcare is a complex systems problem and requires systems thinking type solutions. We will show how systems thinking and the robust tools developed by Schewhart/Deming in 1940s and the more recent techniques and philosophy of Lean-SixSigma have been used by various practitioners to address quality and cost in healthcare.

This study examines the design of care coordination teams in healthcare. We hypothesize that greater levels of team structure improves coordination and leads to better outcomes. To test the hypothesis, we conduct a quasi-experiment using a unique data set of healthcare teams.

Social Desirability Bias (SDB) explains why self-reported compliance (SRC) with hand-hygiene (HH) regulations is much higher than observed compliance (OC). SDB decomposes into self-deception and image management. Using hospital data we show that SRC and OC are uncorrelated, respondents know their own compliance rate, and image-management dominates self-deception.

This study aims to assess Brazilian public university hospital outpatient chemotherapy treatment performance index and costs. It was considered labor, material and drug costs. At total, 72 treatment protocols were assessed during 2014. The treatments production costs identification allow to identify losses, enhance budget use and increase patient care.
073-0533  Predicting Colorectal Cancer Mortality  
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States  
Leila Zia, Student, Wikipedia, United States  
David Anderson, Assistant Professor, City University of New York, United States  
Kim Rhoads, Assistant Professor, Stanford University, United States  

Having accurate, unbiased prognosis information can help patients and providers make better decisions about what course of treatment to take. Using a comprehensive dataset of all colorectal cancer patients in California, we generate predictive models that estimate short-term and medium-term survival probabilities for patients based on clinical and demographic characteristics.

073-1930  Robust Fractionation in Cancer Radiotherapy With Two Modalities  
Sevnaz Noroullahi, Student, University of Washington, United States  
Archis Ghate, Associate Professor, University of Washington, United States  

The optimal fractionation problem with two modalities involves finding the dose per treatment session for each modality and the total number of sessions. We present a robust formulation of this problem using interval uncertainty for the linear-quadratic dose-response parameters. An exact solution method based on KKT conditions will be discussed.

073-0501  Healthcare Data: A Review of the Literature  
Giovana de Oliveira, Student, CEETEPS, Brazil  
Marcelo Okano, Professor, CEETEPS, Brazil  
Marcia Ito, Researcher, IBM Research, Brazil  

Large amounts of data are generated in healthcare, structured or unstructured and they come from different sources (clinical, hospital, sensors, etc.). This paper aims to analyze the architecture of health database, through a review of the literature in order to contribute in how the integration of health data is model.

073-0444  Disruption Risk Management for Two-Echelon Supply Chains: Inventory versus Reserve Capacity  
Florian Lücker, Student, Epfl, Switzerland  

This research focuses on managing supply chain disruption risk using inventory and reserve capacity in a two-echelon supply chain under stochastic demand. We find conditions when the use of inventory versus reserve capacity is optimal.

073-1380  Incentive Contracts for Capacity Restoration under Risk of Supply Disruption  
Zhiyuan Chen, Lecturer, Wuhan University, China  
Jianbin Li, Professor, Huazhong University of Science & Technology, China  
Zhong Zheng, Student, Huazhong University of Science and Technology, China  
Zhixin Liu, Associate Professor, University of Michigan Dearborn, United States  

We consider a supply chain consisting of a supplier and a buyer. There is risk of capacity disruption, but the supplier can rebuild his capacity if he invested before a disruption. For both direct and indirect incentive contracts for capacity restoration, ex post and ex ante commitment strategies are studied.

073-1499  Stability of Complex Supply Networks  
Guven Demirel, Lecturer, University of Essex, United Kingdom  
Bart MacCarthy, Professor, University of Nottingham, United Kingdom  
Daniel Ritterskamp, Lecturer, Bristol University, United Kingdom  

We study the impact of network structure on the stability of material flows in real-world supply networks. We show that the network complexity, shared resources, and strains due to material availability and capacity limitations impact stability. We identify the firms that are critical for the dynamic behaviour of the network.

073-1523  Corporate Social Responsibility: Insurance or Liability?  
Christoph Bode, Professor, University of Mannheim, Germany  
Maximilian Merath, Student, University of Mannheim, Germany  

Prior research revealed mixed effects of a firm's CSR reputation on stakeholder reactions subsequent to CSR incidents. Based on a randomized vignette experiment, we study whether these differences depend on incident severity and on the nature of a firm's CSR reputation (substantive vs. symbolic).

073-0904  The Impact of Social Capital on Downstream Resilience and Financial Performance  
Minhao Gu, Student, Zhejiang University, China  
Baofung Huo, Professor, Zhejiang University, China  

Using 216 samples collected from Chinese manufacturers, we empirically investigate how social capital with customers improves downstream resilience, and then improves financial performance. We also explore how demand and supply side risks moderate the relationship between social capital and downstream resilience. The results will contribute to theory and practice.

073-1195  Hidden Capabilities for Mitigation of External Threats  
Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil  

Companies in different regions of the world are facing increasing threats like robbery and counterfeiting, among others. We proposed the concept of hidden capabilities, which are capabilities developed in the supply chain in order to mitigate those threats. Case studies are presented to discuss the proposal.

073-1317  Resilience Capabilities to Fight Counterfeit Medicines in Supply Chain: Evidences From a Literature Review  

Chair(s): Ricardo Magnani Piaggio
This article aims to identify resilience capabilities to combat counterfeits in medicines supply chain. A systematic literature review reveals agility and collaboration capabilities as enablers to the implementation of new technologies and government regulations. Risk management enhances consumer awareness to the issue. New research avenues combining these capabilities are proposed.

<table>
<thead>
<tr>
<th>Session: Stochastic Models for Scheduling and Logistics</th>
<th>Chair(s): Mahshid Salemi Parizi</th>
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<tbody>
<tr>
<td><strong>073-0106</strong> The Effects of the Variability in the Performance of Business Processes: A Practitioners’ Guide</td>
<td>Rodrigo Romero-Silva, Assistant Professor, Universidad Panamericana, Mexico</td>
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<td></td>
<td>Sabry Shaaban, Assistant Professor, ESC La Rochelle, France</td>
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<td>Erika Marsillac, Assistant Professor, Old Dominion University, United States</td>
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<td>Margarita Hurtado, Associate Professor, Universidad Panamericana, Mexico</td>
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<td>There have been a myriad of studies that investigate a particular effect of the variability on the performance of business processes coming from the Queueing Theory and Production Management fields. The objective of this paper is to present a brief review of the most relevant results stemming from those studies.</td>
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<tr>
<th>Session: Servitization and the Supply Chain</th>
<th>Chair(s): Nishant Mishra</th>
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<tr>
<td><strong>073-0793</strong> Integrating Supply Chain with Maintenance Strategies: An Examination of Antecedents and Outcomes</td>
<td>Birasnav Muthuraj, Assistant Professor, New York Institute of Technology, United States</td>
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<td>Abhishek Mistry, Student, New York Institute of Technology, United States</td>
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<td>The influences of supply chain partners on the formulation of maintenance strategies have not been examined in the operations management literature. In order to bridge the gap, this study investigates the antecedents of the relationship between supply chain integration and maintenance strategies and outcomes of this relationship.</td>
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<th>Session: Meanings and Perceptions</th>
<th>Chair(s): Cassie Evers</th>
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<tr>
<td><strong>073-0705</strong> Customized Production of Smartphones: Meanings Associated With Consumption by Children</td>
<td>Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil</td>
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<th>Session: Scheduling and Logistics</th>
<th>Chair(s): Nishant Mishra</th>
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<tr>
<td><strong>073-0107</strong> Reducing the Mean and Variance of Cycle Times in a Multi-Class Queueing Flow Line</td>
<td>Rodrigo Romero-Silva, Assistant Professor, Universidad Panamericana, Mexico</td>
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<td>Sabry Shaaban, Assistant Professor, ESC La Rochelle, France</td>
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<td>Erika Marsillac, Assistant Professor, Old Dominion University, United States</td>
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<td>In this paper we study how a compromise between reducing the mean and variance of cycle times can be achieved by unbalancing the use of sequencing rules throughout the stages of a multi-class, balanced queueing flow line since both objectives tend to have an inverse relationship while using sequencing rules</td>
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<th>Session: Supply Chain Management</th>
<th>Chair(s): Nishant Mishra</th>
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<tr>
<td><strong>073-1763</strong> Newsvendor With Unlimited Possibilities</td>
<td>Gregory DeYong, Assistant Professor, Southern Illinois University, United States</td>
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<td>Kyle Cattani, Associate Professor, Indiana University, United States</td>
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<td>We evaluate a two-period newsvendor problem. In period one, an order is placed knowing that demand will be from one of N general distributions. In period two, the distribution is known and the order can be adjusted. We identify closed-form solutions for both the preliminary and revised order.</td>
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<th>Session: Marketing and Operations Management Interface</th>
<th>Chair(s): Cassie Evers</th>
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<tr>
<td><strong>073-1929</strong> Selling Products and After-Sales Service When Components Expire</td>
<td>Nishant Mishra, Assistant Professor, Faculty of Business and Economics, Belgium</td>
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<td>Dong Li, Student, Singapore University of Technology and Design, Singapore</td>
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<td>We look at warranty- and outcome-based contracting under different compensation schemes, in a durable goods supply chain where product failures have an impact on the customer and suppliers payoffs, and spare parts availability is affected by obsolescence risk.</td>
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The objective was to understand the meanings associated to the smartphones consumption by children. The results demonstrated: a) Interferences caused by the smartphones consumption in children's social interrelationships; b) Industries should establish a durable relationship between brand and children, that should be treated in a specific way for their loyalty.

073-1586 Consumer Risk Perception of Food Safety: A Systematic Literature Review and Research Agenda
Vincius Nardi, Student, Unisinos University, Brazil
Rafael Teixeira, Professor, UNISINOS, Brazil
Daniel Auler, Student, UNISINOS, Brazil

The risk perceived by customers is an inductor of food safety. By a literature review, we analyzed the relationship between consumer risk perception, food safety, and supply chain management. We identified four groups: sociodemographic characteristics, external attributes, trust and willingness to pay. Finalizing, we provided a research agenda.

073-0343 Low Carbon Production Strategy in “Cap and Trade”
Wenzhi Tang, Student, University of Science and Technology of China, China

The global warming problem has attracted worldwide attention. Cap-and-trade has been increasingly used in many countries to reduce carbon emissions. However, some firms are concerned about the additional costs required for carbon reduction, and another important concern comes from the grandfathering permits allocation.

073-0432 Emission Cap Mechanism Design: View of Firm’s Level Carbon Reduction
Li Hu, Student, University of Science and Technology of China, China

The dilemma between economic growth and environmental deterioration has been becoming a serious problem of many national governments. How to depict the goal of government and design the cap mechanism to the firm? What's the firm's optimal coping strategy? Several interesting managerial insights on low-carbon factors are concluded.

073-1719 Firm Reactions Toward Emission Trading Scheme and Carbon Concerned Consumers
Wen Wen, Student, Nanjing University of Aeronautics and Astronautics, China
Peng Zhou, Professor, Nanjing University of Aeronautics and Astronautics, China
Fuqiang Zhang, Professor, Washington University St Louis, United States

We analyze firm’s emission and pricing strategies under emission trading scheme and with carbon concerned consumers. The optimal product carbon intensity and price are derived from a profit maximizing model. Critical factors are recognized and their impacts are discussed. Managerial insights are generated for the firm and the central planner.

073-1169 Implementing Green Supply Partnerships in Fragmented Carbon Policy Regime
Jiyong Eom, Associate Professor, College of Business, Korea, Republic of (South Korea)

Major retailers have started to partner with suppliers to secure products with lower domestic carbon emissions. I examine how and to what extent green supply partnership can develop between carbon-constrained buyers and suppliers without carbon policy. Decentralized pricing of the green supply service is compared with the socially efficient one.

073-1300 A CAS view of Financial Squeeze on Supply Network Structure, Value Creation, and Value Capture
Mei Li, Assistant Professor, Michigan State University, United States
Ednilson Bernardes, Associate Professor, West Virginia University, United States
Ilaria Giannoccaro, Associate Professor, Politecnico Di Bari, Italy
Paul Skilton, Assistant Professor, Washington State University, Tri-Cities, United States

Financial squeeze is a sourcing practice that can have emergent and unexpected impact on the buyer’s supply network. We focus on the effects of financial squeeze on value creation and value capture and on the buyer’s network structure. We also examine the moderation effect of product, industry and supplier characteristics.

073-2017 Antecedents and Enablers of Supply Chain Value Creation: A Perspective of SMES in Local Procurement
Yusuf Kiwala, Student, University of Pretoria, South Africa
Johan Olivier, Assistant Professor, University of Pretoria, South Africa

The purpose of the study was to investigate how SMEs that are involved in local procurement create supply chain value. Using structural equation modeling, the study findings show that information sharing, collaborative communication, opportunity and commitment competence, and optimal trust are the key value drivers for local SMEs.
This paper aims to present a case study about knowledge management of applied IT in Brazilian companies, verifying the adherence of the KM with objectives and strategies. The results showed that KM is a key factor in strategic planning for the search for competitive advantage.

Using real-effort experiments, we investigate how behavioral factors influence the causes and consequences of Inventory Record Accuracy. More specifically, using sorting and picking tasks we aim to find out how individual differences and differences in workload play a role in causing errors and responding to encountered errors.

This study focuses on a survey instrument aiming to capture the effect of interaction capabilities on SMEs' participation in global value chains. An index to capture the extent of participation was also advanced based on the Ansoff matrix. The paper reports the instrument development prior to conducting the empirical study.

We provide a game-theoretic framework to model firm disruptions which arise not only due to direct damage, but also from the interruption of normal operations because of lack of supply; that is, due to disruption cascades from suppliers in the adjacent tiers and beyond.

A collaboration model in the Beer Industry is presented as Case Study with the aim of enhancing the efficiency of the Closed-Loop Supply Chain for the return of returnable glass bottles using System Dynamics. This model achieves the global objective of Customer Service Level instead of local objectives of agents.

The goal is to develop a making tool to close the loop of clothing value chain. Material, economy and technology are vital factors influences decision in the closed loop chain. These three factors and sixteen criteria associated with factors are examined with analytical hierarchy process under fuzzy environment.

Research needs to focus on providing innovative models that can demonstrate the competitive advantage that can assist extracting value from product returns. Our models reflect important aspects of disruption and risk mitigation that can influence implementation of product recovery process from source or returns from customer.
This paper studies the fast fashion seller and the luxury seller with different pricing strategies. Consumers may strategically choose to purchase from the fast fashion seller or the luxury seller, and they may also choose when to purchase. We use the rational expectations equilibrium and derive some management insights.

### Session: Alternative Transportation Modes in Humanitarian Logistics

**Chair(s):** Muhammad Azmat

**548**

**Monday, 09:45 AM - 11:15 AM, Grand J**

**Track:** Humanitarian Operations and Crisis Management

#### 073-0328

**Hybrid Cargo Airships - A Potential Transport Alternative for the Humanitarian Logistician**

Peter Tatham, Professor, Griffith University, Australia
Craig Neal, Student, University of New South Wales, Australia

Hybrid Cargo Airships have the potential to convey large payloads over significant distances at relatively low cost and with a small carbon footprint. This conceptual research demonstrates how such HCAs could be used to improve the logistic response to a rapid onset disaster through consideration of three recent events.

#### 073-1557

**Findings From Field Work in Food Banking, Healthcare and Indigent Population Service Organizations**

Sanjay Ahire, Professor, University of South Carolina, United States

Non-profits engaged in meeting more chronic challenges have received relatively less attention. I will present actual action research and consulting work I have conducted in food banking, healthcare, and indigent population services. Insights on operations, business process, and supply chain dimensions of these organizations will be offered.

#### 073-1036

**Comparison of Muslim versus non-Muslim NGO's supply chain in Muslim majority developing countries**

Muhammad Azmat, Student, Vienna Univ of Econ & Business Admin, Austria
Maria Besiou, Professor, Kuehne Logistics University, Germany
Sebastian Kummer, Professor, Vienna Univ of Econ & Business Admin, Austria

In an event of humanitarian disaster, aid organization's response and its supply chain need to be both fast and agile, but sometimes religious values stigmatize the operability and accessibility of humanitarian supply chain. This empirically evident exploratory research investigates the differences between supply chains of different NGOs in Muslim countries.

### Session: Procurement

**Chair(s):** Feyza Guliz Sahinyazan

**549**

**Monday, 09:45 AM - 11:15 AM, Grand K**

**Track:** Humanitarian Operations and Crisis Management

#### 073-0265

**ERP Systems for Humanitarian Organizations: The Case of Médecins Sans Frontières (MSF)**

Ioanna Falagara Sigala, Student, Vienna Univ of Econ & Business Admin, Austria
Tina Wackolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria
Bill Kettridge, Professor, University of Memphis, United States

This research uses the case of MSF to investigate how ERPs systems could provide a humanitarian organization with a competitive advantage and what design principles need to be considered in ERPs for humanitarian organizations to improve humanitarian operations and response.

#### 073-1079

**Optimal Fleet Size and the Efficiency-Equity Trade-Off in Humanitarian Procurement Policies**

Christos Bitos, Student, Kuehne Logistics University, Germany
Laura Turrini, Assistant Professor, European Business School, Germany
Maria Besiou, Professor, Kuehne Logistics University, Germany

We focus on fleet management and empirically estimate the real needs of a decentralized humanitarian organization that operates both relief and development programs. We study the optimal allocation of vehicle procurement, based on a set of constraints, in order to satisfy organizational needs as efficiently and equitably as possible.

**073-1342**

**Price Flexible Transportation Procurement Contracts for Aid Delivery in Developing Countries**
In Africa, managing freight transportation of the food aid supply chain is challenging due to poor infrastructure, security risks, and volatile markets. We develop an econometric model that identifies the determinants of transportation prices and a real options approach to design price-flexible contracts that improves the response rate of transporters.

Monday, 09:45 AM - 11:15 AM

557  
Monday, 09:45 AM - 11:15 AM, Cedar B  
Track: Product Innovation and Technology Management  
Chair(s): Xishu Li

**073-0658**  
Pricing of New Product Technologies in Supply Chains and Technology Markets  
Ayhan Aydin, Assistant Professor, George Mason University, United States

Upstream firms can transfer technology downstream either by licensing the use of the technology or through a product carrying the advanced technology. We investigate the effect of the pricing method—fixed tariff, only variable tariff, and two-part tariff—in both cases on the level of technology transferred.

**073-1539**  
The Influence of a Firm’s Supply Chain on its Innovation Capability  
Shubhobrata Palit, Student, Georgia Institute of Technology, United States  
Soumen Ghosh, Professor, Georgia Institute of Technology, United States

We explore the role of a firm’s supply chain in driving its innovation capability. Using secondary data, we examine how the diversity and the intensity of the innovation expertise of suppliers impact a firm’s innovation capability, along with the moderating effect of its structural position in its supply network.

**073-1878**  
Circular Economy and Developing Products  
Antonio César Galhardi, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil  
Marcelo Okano, Professor, CEETEPS, Brazil  
Getulio Akabane, Retired, CEETEPS, Brazil

Companies have refined their ability to invent products and produce them efficiently; however, this system is far from ideal, specifically when products are wasted energy and material become wasteful. This article discusses how inter-functional collaboration and customer-focused design thinking can help companies reap more value from energy and resources.

**073-0577**  
Launching Next Generation Products In A Competitive Market  
Xishu Li, Student, Rotterdam School of Management, Netherlands  
Rob Zuidwijk, Professor, Rotterdam School of Management, Netherlands  
René De Koster, Professor, Erasmus University Rotterdam, Netherlands

We consider a next-generation product launch problem in a competitive market under uncertain product quality and consumer taste. We focus on the two dimensions of competition effect on a firm’s capacity decisions: 1) the next-generation product versus the existing product and 2) competition between firms for the two products.

Monday, 09:45 AM - 11:15 AM, Balsam

**558  
Session: Social Media and Networks  
Chair(s): Lingling Yu

**073-1608**  
Engaging Charitable Content Generation in Online Social Networks: Evidence from Twitter  
Xue Tan, Student, University of Washington, United States  
Yingda Lu, Assistant Professor, Rensselaer Polytechnic Institute, United States  
Yong Tan, Professor, University of Washington, United States

In social broadcasting sites, users’ charitable content generation is affected by both their followees (to whose content they subscribe) and followers (people who subscribe to these users’ broadcasts). In this paper, we examine how reciprocity of followees affects social influence on users’ charitable content generation.

**073-0033**  
Teammate Preference in Online Crowdsourcing Competitions  
Indika Dissanayake, Assistant Professor, University of North Carolina Greensboro, United States  
Jie Zhang, Associate Professor, University of Texas Arlington, United States

In this paper, we explore the solvers’ preference in choosing a teammate in online crowdsourcing competitions in terms of skill level, skill sets, personal traits, and geographic and social network proximities. The findings of this study provide insights for understanding teammate selections in online competitions.

**073-1771**  
Can We Trust Online Physician Ratings? Evidence From Cardiac Surgeons in Florida  
Feng (Susan) Lu, Assistant Professor, Purdue University, United States  
Huaxia Rui, Assistant Professor, University of Rochester, United States

Despite heated debate about the pros and cons of online physician ratings, little systematic work has examined the correlation between physicians’ online ratings and their actual medical quality. We investigate whether online ratings are informative about physicians’ medical quality.

**073-1095**  
Exploring the Effects of Excessive Social Media Use on Job Performance  
Lingling Yu, Student, University of Science and Technology of China, China  
Xiongfeng Cao, Associate Professor, University of Science and Technology of China, China  
Zhiying Liu, Professor, University of Science and Technology of China, China

This study applies the transactional theory of stress and coping to explore the effects of excessive social media use on individual job performance and its exact mechanism. An extended stressor-strain-outcome research model is proposed to explain how excessive social media use at work influences individual job performance.
073-0993  Operational Practices and Performance in Continuous Process Firms
André Luís Duarte, Professor, Insper Institute for Education and Research, Brazil
Guilherme Martins, Professor, Insper Institute for Education and Research, Brazil
Chen Yen-Tsang, Professor, NEOMA Business School, France

This study analyzes the relationship between operational practices (OPs) adoption and firm performance. We collect monthly data from 29 continuous process plants between 2012 and 2015. Greater adherence to OPs leads to higher, less variable, and sustainable performance. Maintenance OPs had the greatest impact on performance.

073-1759  Compete in Price or Service? A Study of Personalized Pricing and Money Back Guarantees
Jing Chen, Professor, Dalhousie University, Canada
Bintong Chen, Professor, University of Delaware, United States

Retailers use both pricing and service strategies to respond to intensified competition. Here we develop a duopoly model to investigate the impact of the increasingly popular personalized pricing strategy (PPS) and the widely used Money Back Guarantee (MBG) customer returns policy.

073-1906  Complaining About Product Defects: The Moderating Role of Severity and Warranty on Quality Perceptions
Giuseppe Catenazzo, Student, ?, ?, ?, Switzerland
Marcel Paulussen, Professor, University of Geneva, Switzerland

This research examines how product defects influence the perceptions of product quality among non-complaining customers and complainers whose products are fixed, partially or not after repairs (recovery effort). Quality perceptions decrease only for customers who experience a severe defect. Warranty attenuates the adverse effects of severe defects on quality perceptions.

073-1254  Meanings Associated with Car Consumption by Emerging Middle Class Women in the Age of Maturity
Tonny Rodrigues, Associate Professor, COPPEAD Graduate Business School / Federal University of Rio de Janeiro, Brazil
Nicholas Silva, Student, Faculdade Santo Agostinho, Brazil

The objective of this research is to understand the meanings associated with the consumption of automobiles by women of the emerging middle class, between 45 and 60 years. The results guide car manufacturers to produce customized cars with extra accessories, a more detailed, rounded design and greater safety.

073-0211  Financing a Small Capital-Constrained Community Firm Based on Advance Selling and Social Ties
Shuang Xiao, Student, Huazhong University of Science & Technology, China
S. Alex Yang, Assistant Professor, London Business School, United Kingdom
Yiangos Papanastasiou, Assistant Professor, University of California Berkeley, United States
A financially-constrained community firm has to borrow from a bank to cover the fixed investment for normal operation. Alternatively, the firm can conduct advance selling to alleviate her financial constraint. Does the advance selling strategy really help in alleviating the firm’s financial predicament? This paper attempts to answer this question.

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<tr>
<td>073-1161</td>
<td>A Global Optimization Algorithm for Maximizing Service Level of Heterogeneous Jobs Routed to Heterogeneous Servers</td>
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</table>

Indian food program, in recent years, has increased its coverage substantially among bottom-of-the-pyramid. In order to curb the subsidy increase, this paper proposes a game-theoretic model that considers the interaction between a surplus state and a deficit state in procuring grains to reduce high state taxes in the surplus state.

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<td>073-0034</td>
<td>Transaction Cost Economics: How Shared Data in the Supply Chain Impacts Asset Specificity</td>
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<td>073-0097</td>
<td>Service Systems with Dependent Service and Patience Times</td>
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The three core tenets of Transaction Cost Economics (Coase 1937; and Williamson 1985) include: Frequency, Uncertainty, and Asset Specificity. I investigate how the information revolution, specifically the emergence of shared data, impacts Asset Specificity in the supply chain.

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Maheswar Singha Mahapatra, Student, Indian Institute of Technology Kharagpur, India
Biswaajit Mahanty, Professor, Indian Institute of Technology Kharagpur, India

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<tr>
<td>073-0639</td>
<td>The Sequence Effects of Customer Experiences over Service Process Stages on Satisfaction</td>
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Min Kyung Lee, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States
Bernardo Quiroga, Assistant Professor, Clemson University, United States
Rohit Verma, Professor, Cornell University, United States

We consider a three-cities network. Each city operates its own airport. The capacities of two airports are scarce. Airline markets are atomistic which together with scarce capacities creates congestion externalities. Airports independently choose between congestion pricing and airport slots to manage congestion and maximize its city’s social welfare.

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<td>073-1071</td>
<td>The Sequence of Scripted Service Encounters</td>
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Liana Victorino, Associate Professor, University of Victoria, Canada
Michael Dixon, Assistant Professor, University of Western Ontario, Canada
Don Wardell, Professor, University of Utah, United States
Rohit Verma, Professor, Cornell University, United States

Customers are often involved in a series of encounters that, when taken together, represent their overall service experience. Using a video experiment, we investigate both the sequence and alignment of similar or differing script levels across service encounters.

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<td>A Congestion Management Game</td>
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Achim Czerny, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong
Hao Lang, Student, Hong Kong Polytechnic Univ, Hong Kong

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<td>073-2010</td>
<td>Effectively Integrating Continuous Improvement Principles to PMBOK</td>
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Brian Galli, Professor, Long Island University, United States

The Project Management Institute's Project Management Body of Knowledge (PMBOK) offers knowledge and a project lifecycle for teams to plan and execute any project. Lean Six Sigma tools can navigate through PMBOK. The integration of Lean Six Sigma and the PMBOK lifecycle can complete projects within constraints while exceeding expectations.
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<td>Serve Me Quicker to Get Me Back Later: Empirical Evidence From Restaurant Service Operations</td>
<td>Christopher Ryan, Associate Professor, University of Chicago, United States; Yifan Feng, Student, University of Chicago, United States; Rene Caldentey, Professor, University of Chicago, United States</td>
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<td>565</td>
<td>Learning Customer Preferences Through Crowdvoting</td>
<td>Asuman Ozdaglar, Associate Professor, Massachusetts Institute of Technology, United States; Azarakhsh Malekian, Assistant Professor, University of Toronto, United States; Vahideh Manshadi, Assistant Professor, Yale University, United States; Kasra Ferdows, Professor, Georgetown University, United States; Torbjørn Netland, Assistant Professor, ETH Zurich, Switzerland; Thomas Friedli, Associate Professor, University of St. Gallen, Switzerland</td>
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A firm is launching a new product with multiple potential designs. To pick the design most preferred by customers, the firm invites potential customers to vote for their favorite designs. We study how to dynamically customize each voter's choice set, in order to most efficiently learn overall customer preferences.

**Boosted Second-Price Auctions, Simple Mechanisms to Capture Heterogeneity**

Negin Golrezaei, Student, University of Southern California, United States  
Vahab Mirrokni, Research Director, Google, United States  
Hamid Nazerzadeh, Assistant Professor, University of Southern California, United States  
Max Lin, Manager, Google, United States

Many Ad Exchanges run second-price auctions in the belief that they can extract maximum revenue. However, second-price auctions do not generate maximum revenue, especially when advertisers are heterogeneous. To address this problem, we propose a new auction format called "boosted second-price auctions" that improves revenue when there are heterogeneous advertisers.

**Dynamic Production Planning With Two Production Modes, Switching Costs, and Carbon Price Volatility**

Di Huang, Assistant Professor, Beijing Jiaotong University, China  
Jian Chen, Professor, Tsinghua University, China  
Juliang Zhang, Professor, Beijing Jiaotong University, China

In this talk, we study a multi-period production planning problem where a manufacturer has two production modes: one is clean but expensive and another is dirty but cheap (a switch cost is incurred when the production mode is changed), under carbon emission regulation, carbon price volatility and random demands.

**Inventory System of Two Substitutable Products with Positive Replenishment Lead Times**

Youyi Feng, Professor, Zaragoza Logistics Center, Spain  
Jianjun Xu, Assistant Professor, Zaragoza Logistics Center, Spain  
Shaohui Zheng, Professor, Hong Kong University of Science & Tech, China

We consider a periodic-review inventory system of two products with positive replenishment lead times, assuming that downward substitution is allowed. We show that the objective function is L^*natural convex, and then explore various monotone properties of the optimal policy.

**Approximating Optimal Inventory Policies for Assemble to Order Systems**

Levi DeValve, Student, Duke University Durham, United States  
Sasa Pekec, Associate Professor, The Fuqua School of Business, United States  
Yehua Wei, Assistant Professor, Duke University Durham, United States

We develop performance bounds on inventory policies for assemble to order systems using a primal dual approach. We show that heuristics based on a Newsvendor model provide good bounds in a variety of settings, including large and sparse systems, and also demonstrate the limits of such an approach.

**Stock or Print? Impact of 3D Printing on Critical Spare Parts Logistics**

Jing-Sheng Song, Professor, Duke University Durham, United States  
Yue Zhang, Student, Duke University Durham, United States

3D printing has gained attention due to its renowned customizing flexibility and cost advantage in small-scale production. In this paper, we construct a general framework to analyze the impact of this technology in spare part sourcing. Our results highlight its superiority in providing highly diversified spare parts replacement service.